High Conservation Values in the Alberta - Pacific Forest Industries Inc. Forest Management Agreement Area

Assessment, management and monitoring of forest conservation from a global, national and local perspective based on Forest Stewardship Council® (FSC®) Principle 9

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Important information for reading this document – A High Conservation Value (HCV) assessment is primarily a communications document. It brings together all of the values information in one location to allow for a fair assessment of what is a High Conservation Value (HCV). To accomplish this, there is a heavy reliance on many other documents. Most of these are accessible through the Internet links that are included in this report. ***If the reader wishes to fully access these, this report should be read on a computer with a good internet connection***. Here is some guidance on accessing the supporting documents:

Important: Depending on your software, most links (Blue text) will require you hover over the text, hold the control key and click on the link.

After following a link in the document, to return to the previous page:

Windows: return to previous page (PDF or WORD) by pressing ALT left arrow
IOS: return to previous page by pressing Command Tab

- References are provided in several formats depending on the purpose: Web links are provided for key documents in the text (blue fonts) or footnotes, and have been verified as of the date of this report; a citation list is provided for general scientific papers not available on line, and other papers of general interest. Additional links are listed under "assessment methodology" within each element. There is some redundancy to allow for different ways for users to access information.

- This document contains only a few maps and illustrations because the linked documents will provide better and normally more up to date graphical information.

Please send comments to Tina Langille-Hayward

Acknowledgements
The development of this HCV Report required the efforts and contributions of many groups and individuals. As well, efforts contributing to the development of the 2015-2025 Forest Management Plan and other documents must be acknowledged as those documents serve as the primary basis for this report. In addition, Mistik Management Ltd generously shared text and information from their HCV report. And finally, the Alberta-Pacific Forest Industries Inc. (Al-Pac) HCV Team offers their sincere appreciation to:

- The Alberta-Pacific Forest Industries Inc. Landscape Advisory Group
- Ducks Unlimited Canada
- Canadian Parks and Wilderness Society
- Indigenous Communities within and adjacent to the FMA area

About Version 2.0, October 2020

This HCV report draws on the work Al-Pac has done in preparing the Forest Management Plan (FMP), General Development Plan (GDP) and other planning documents. These are linked to or quoted frequently.

This version of the HCV report represents a change in format from the 2015 report. In this version there are more references to values that were considered but were not designated HCV. This version does not make major changes to previously designated HCVs, as would be expected given the long history of Al-Pac certification to FSC.

This report includes a section on species at risk which is consistent with the analysis done for Principle 6.

Many new web links are included to make verification of the HCV easier.

The discussion about Large Landscape Level Forest or Intact Forest Landscape that is occurring across Canada is centred on maintaining large fully functioning ecosystems. This discussion was still occurring since the new FSC standard was released in 2018.

Additional information
For further information on the HCV concept, the HCV Resource Network document (amended 2017) "Common Guidance for the Identification of High Conservation Values" and Common Guidance for the Management and Monitoring of HCV is helpful.

Acronyms and Terminology

AAC	Annual Allowable Cut
ACIMS	Alberta Conservation Information Management System
Al-Pac	Alberta-Pacific Forest Industries Inc.
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
FMA	Forest Management Agreement
FMP	Forest Management Plan
FMU	Forest Management Unit
FPIC	Free Prior Informed Consent
FSC	Forest Stewardship Council
GDP	General Development Plan
GOA	Government of Alberta
HCV	High Conservation Value
HCVF	High Conservation Value Forest
HCV RN	High Conservation Value Resource Network
IBA	Important Bird Area
IFL	Intact Forest Landscape
IUCN	International Union for the Conservation of Nature
LAG	Landscape Advisory Group
LLF or LLLF	Landscape Level Forest or Large Landscape Level Forest
NBS	National Boreal Standard (of FSC)
NFPL	Northland Forest Products Limited
OIAS	Other Interested & Affected Stakeholders
OGR	Operating Ground Rules
ROC	Record of Consultation
SAR	Species at Risk

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High Conservation Values – Executive Summary

This report outlines an assessment of High Conservation Values (HCVs) undertaken on behalf of Alberta-Pacific Forest Industries Inc. (Al-Pac) in accordance with Principle 9 of the Forest Stewardship Council (FSC) Principles and Criteria. Al-Pac manages their Forest Management Agreement area under the authority of a Forest Management Agreement (FMA) with the Government of Alberta. Under the agreement, the company is licensed to sustainably harvest trees on 6.8 million hectares (ha) in northeastern Alberta. The Forest Management Plan (FMP) is the guiding document for the management of values and is regulated and approved by the Province of Alberta.

This assessment of HCVs is guided by the "High Conservation Value Framework", which is Annex D of the FSC® National Forest Stewardship Standard of Canada[1]. This is the accredited standard for Canada. This report is provided to meet the requirements for an FSC certification assessment. This HCV assessment resulted in the following HCV designations:

[1] Forest Stewardship Council. 2018. The FSC National Forest Stewardship Standard of Canada. FSC-STD-CAN-01-2018 V 1-0 EN. FSC National Forest Stewardship Standard of Canada.

Table 1. Identified High Conservation Values on the Al-Pac FMA area.

HCV Cat.	HCV Element (links)	HCV Designation Decision (links to assessment)	Management (Links[2])	Monitoring	Designation
Category 1 Concentrations of Biodiversity	1 -- Biodiversity/ Species-at-Risk (SAR)	Yellow-banded Bumble Bee; Bay-Breasted Warbler; Cape May Warbler; Evening Grosbeak; Black-throated Green Warbler; Canada Warbler; Olive-sided Flycatcher;	SAR species managed through NRV approach	Forest inventory updates for NRV approach and ABMI	HCV
		Western Toad; Horned Grebe; Lesser Yellowlegs; Rusty Blackbird; Western Grebe; White-winged Scoter; Yellow Rail; Arctic Grayling	Riparian aquatic species management	Al-Pac and GOA monitor compliance on OGRs	HCV
		Woodland Caribou; Trumpeter Swan;	Featured species management for Trumpeter Swan and Caribou	Featured monitoring for Trumpeter Swan and Caribou	HCV
		Barn Swallow; Barred Owl; Northern Myotis; Little Brown Myotis; Wolverine;	Site-Specific Management	Al-Pac and GOA monitor compliance	HCV
		Transverse Lady Beetle; Bank Swallow; Short-eared Owl; Common Nighthawk; Wood Bison; Brassy Minnow	Low risk	N/A	HCV
	2 -- Endemic Species	None Identified	N/A	N/A	None Identified
	3 -- Regionally significant critical habitat for seasonal	Important Bird Areas/Staging/Molting Heronries Pelican Nesting Colonies	Follows for Operating Ground Rules for working near water	Al-Pac and GOA monitor compliance on OGRs	HCV

[2] General information about management and monitoring for designated HCVs is provided in this link, but official control documents should be used for operational information.

HCV Cat.	HCV Element (links)	HCV Designation Decision (links to assessment)	Management (Links[2])	Monitoring	Designation
	concentrations of species	Grayling Spawning areas	Follows for Operating Ground Rules for working near water, and stream crossing inspections	Al-Pac and GOA monitor compliance on OGRs	Possible HCV
	4 -- Significant regional & focal species	Caribou	Forestry deferrals, aggregated harvest & subregional plans, access management, habitat restoration, research, and following Operating Ground Rules prescription	Al-Pac and GOA monitor compliance on OGRs, and GOA monitors caribou population & habitat	HCV
	5 -- Edge species or outlier populations	None Identified	N/A	N/A	None identified
	6 -- Conservation Areas	Assessment of conservation land use designations adjacent to Al-Pac FMA area: Conservation Areas (Table 9): • Provincial Parks • Wildland Provincial Parks • Provincial Rec Areas • Wilderness Areas • Ecological Reserves • Natural Areas	Technically outside of the FMA area but require protection Operating Ground Rules	Al-Pac and GOA compliance monitoring to control encroachment & access.	HCV
Category 2 Large Landscape Level Forests	7 -- Large Landscape Level Forest	None Identified	N/A	N/A	None Identified

HCV Cat.	HCV Element (links)	HCV Designation Decision (links to assessment)	Management (Links[2])	Monitoring	Designation
Category 3 Ecosystems	8 -- Rare ecosystem types	Rare Wetland Types Samphire Emergent Marsh	Managed through access controls & landscape management through FMP	Al-Pac and GOA compliance effectiveness monitoring	HCV Possible HCV
	9 -- Significantly declined ecosystems	None Identified	N/A	N/A	None Identified
	10 -- Large landscape level /fragmented forests	None Identified	N/A	N/A	None Identified
	11 – Nationally Regionally signif. diverse/ unique ecosystems	None Identified	N/A	N/A	None Identified
Category 4 Ecosystem Services	12 -- Drinking Water	None Identified	N/A	N/A	None Identified
	13 -- Flooding, drought, water quality ecosystem services	None Identified	N/A	N/A	None Identified
	14 -- Erosion control	None Identified	N/A	N/A	None Identified
	15 -- Barriers to destructive fire	Fire Smart Community Zone Provincial responsibility	Al-Pac willing to work with communities within sphere of influence	N/A	HCV
	16 -- Landscapes impacting agric. & fisheries	None Identified	N/A	N/A	None Identified

HCV Cat.	HCV Element (links)	HCV Designation Decision (links to assessment)	Management (Links[2])	Monitoring	Designation
Category. 5 Community	17 -- Local communities' basic needs and livelihoods	None Identified	N/A	N/A	None Identified
Category 6 Cultural	18 -- Traditional cultural identity	Indigenous Values	Confidential to Indigenous communities	Compliance by forest companies with agreed upon mitigation measures. Opportunities for input from the communities and stakeholders.	HCV
		Archeological sites verified to hold cultural artifacts, either Indigenous or non-Indigenous	Archeological sites system	Al-Pac and GOA compliance monitoring to control encroachment	HCV
		Portion of Clearwater River and Christina River designated as Heritage	Canadian Heritage Rivers System HCV	Al-Pac and GOA monitor compliance on OGRs	HCV
		Lakes and watercourses important to Indigenous communities	FMP contains direction	Opportunities for input from the communities and stakeholders.	HCV
	19 -- Other values that constitute HCVs	None Identified	N/A	N/A	None Identified

Overview of HCV Assessment

Alberta-Pacific Forest Industries Inc. (Al-Pac) is responsible for the Forest Management Agreement (FMA) area under the authority of a Forest Management Agreement with the Government of Alberta. Al-Pac is committed to maintaining an internationally competitive and sustainable enterprise with minimal effects on the environment and their FSC certification (FSC®-C022642) supports this commitment. Al-Pac had maintained FSC certification to the National Boreal Standard since 2005. In 2020, Al-Pac transitioned from the National Boreal Standard to the new FSC National Forest Stewardship Standard of Canada. Part of the certification process is a requirement for the managers to complete an assessment of High Conservation Values (HCVs) using the Forest Stewardship Council's Principle 9 definition. According to the definition, High Conservation Values (HCVs) possess one or more of the following attributes:

Forest areas containing globally, regionally or nationally significant:

- HCV 1 – Species diversity. Concentrations of biological diversity* including endemic* species, and rare*, threatened* or endangered species that are significant* at global, national or regional levels.
- HCV 2 – Landscape*-level ecosystems* and mosaics. Intact Forest Landscapes* and large landscape*-level ecosystems* and ecosystem* mosaics that are significant* at global, national or regional levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.
- HCV 3 – Ecosystems* and habitats*. Rare*, threatened*, or endangered ecosystems*, habitats* or refugia*.
- HCV 4 – Critical*ecosystem services*. Basic ecosystem services* in critical* situations, including protection* of water catchments and control of erosion of vulnerable soils and slopes.
- HCV 5 – Community needs. Sites and resources fundamental to satisfying the necessities of local communities* or Indigenous Peoples* (for livelihood, health, nutrition, water, etc.), identified through engagement* with these communities or Indigenous Peoples*.
- HCV 6 – Cultural values. Sites, resources, habitats* and landscapes* of global or national cultural, archaeological or historical significance, and/or of critical* cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities* or Indigenous Peoples*, identified through engagement* with these local communities* or Indigenous Peoples*.

This assessment of HCV is guided by the "High Conservation Value Framework", which is Annex D of the FSC National Forest Stewardship Standard of Canada. It follows the guidance provided by FSC in High Conservation Value Guidance for Forest Managers FSC-GUI-30-009 V1-0 EN.

Understanding HCV on public land in Alberta requires an understanding of the size of Canadian forests. The Al-Pac FMA area is the largest contiguous FSC-certified forest in the world at 5.9 million hectares (FMP) .

Current provincial forest policy addresses a wide range of values using policy documents, or resource guides for special values[3]. The role of the FSC HCV process is to verify that the forest operations being carried out meet the global standard that seeks to protect an overarching set of conservation values. There is no intention of changing the current values terminology, which is quite mature in the Al-Pac FMA area. The public engagement process will be based on the use of local terminology rather than the FSC terminology. It is the responsibility of the managers to ensure that the full FSC meaning of HCV is conveyed through the forest management planning process, including a series of plans (Appendix 1. Alberta Forest Management Planning System Overview). This report will be made available to the public.

A forest has "high" conservation value when "local communities use the forest for their basic needs or livelihoods." This is no doubt the case for most of these forests. This area is, and has been, a mainstay of loggers, trappers, tourism establishments and outfitters for a long time. For Indigenous communities it has been home for much longer. The Al-Pac FMA and surrounding area resides in Treaty 6 and Treaty 8 territories, as well as the traditional lands of Métis peoples within Alberta. The Indigenous members of these communities have inherent legal and customary rights related to their longstanding traditional use of this landscape. Defining the values which are "special" and should receive HCV designation is the main function of this report. HCVs are managed using a precautionary approach, as defined in the FSC National Forest Stewardship Standard of Canada and are clearly designated as part of the individual analysis in each section of this report.

The FSC Standard and the HCV Framework, focused at the international level, state that culturally appropriate engagement with Indigenous Peoples and affected and interested stakeholders is required. On public forest everywhere, law and common sense require extensive ongoing engagement with forest users, although compromise and difference of opinion are routine. In an earlier guide, Proforest effectively described the value judgement in designating HCVs:

> "Although some values may have simple yes/no alternatives, many will be measured on a continuum of gradually increasing importance. This means that, although defining HCV should always be based on the best available scientific information, the decision on the threshold level at which a 'value' becomes a 'High Conservation Value' is inevitably a value judgment".

To this end, the Common Guidance for the Identification of High Conservation Values (page 20) advises:

> "In practical terms, significant values are those recognized as being either unique, or outstanding relative to other examples in the same region, because of their size, number, frequency, quality, density or socio-economic importance, on the basis of existing priority frameworks, data or maps, or through field studies and consultations undertaken during the HCV assessment."

Al-Pac uses the following principles based on the standard as their guidance:

[3] General information on forestry in Alberta can be found at https://www.alberta.ca/forestry.aspx and https://www.alberta.ca/forest-management-manuals-and-guidelines.aspx which also contains a link to the guidelines and manuals for regulatory protection of values.

- Engagement opportunities are made available to affected and interested stakeholders and Indigenous Peoples on all HCV-related topics, for which there is an interest in contributing. The report itself is a public document and comments are always welcome.
- Participation can take many forms including consultation done as part of Al-Pac's business and targeted HCV engagement activities such as meetings and phone calls.
- The HCV report is publicly available. Copies are sent to people who express an interest.

In assessing HCVs, the forest managers have been inclusive in their approach, in keeping with the FSC Principles & Criteria (P&Cs). The prescriptions and approaches have been thoughtfully prepared with input from experts, Indigenous people and affected stakeholders. Prescriptions are based on the best available science, a system of effectiveness monitoring, and are operationally sound. The managers are open to reconsidering any of the approaches to manage HCVs, if it is forestry related. Engagement is described in other sections of this report (Overview of Engagement, and Government Regulatory Consultation by Al-Pac).

Purpose & Method

Methodology-- HCV National Framework (Canada)

The framework provided in Annex D of the FSC® National Forest Stewardship Standard of Canada provides the basic approach and guidance for assessing HCVs. There are four criteria in Principle 9 relevant to forest managers. In short, these require: assessment of values, engagement of forest users, development of management prescriptions for values, and monitoring in order to ensure the prescriptions are effective. Management activities must "maintain and/or enhance the identified HCVs" (FSC Principle 9). The four criteria are:

9.1 requires an assessment and describes conditions for reporting
9.2 requires developing "strategies" for managing HCVs
9.3 mandate for implementation of the strategies
9.4 requires monitoring the effectiveness of the management strategies

The assessment of HCVs, development of management strategies and the development of a monitoring program all include engagement of Indigenous Peoples and affected and interested stakeholders. There is also a requirement for a qualified specialist to review the report. As shown in
Figure 1, the FSC standard follows a continuous improvement cycle.

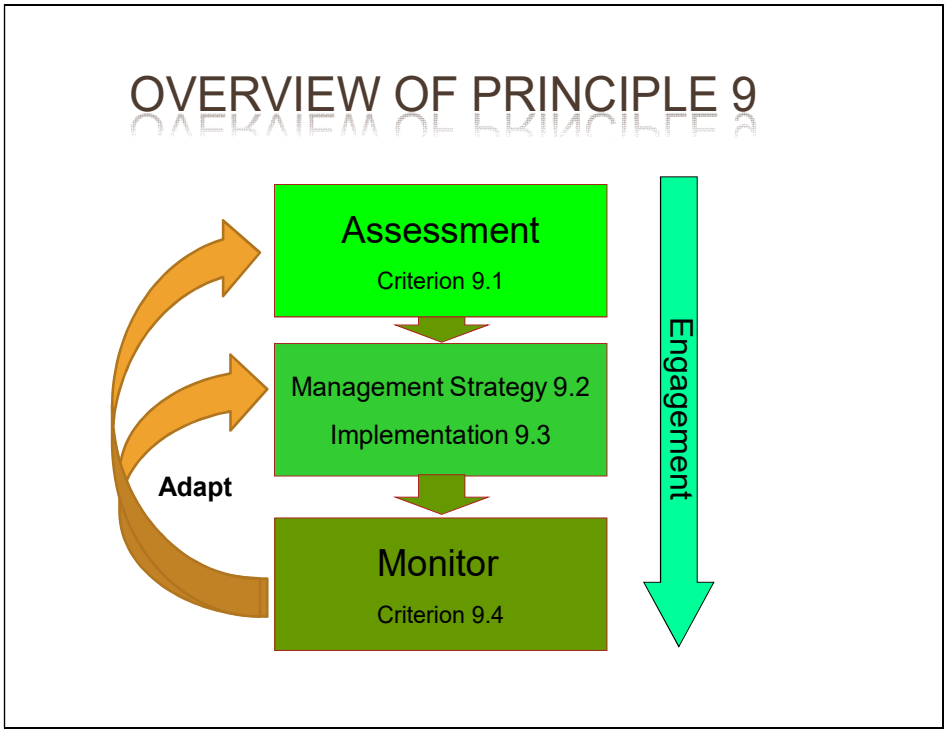

Figure 1. FSC Principle 9 criteria & adaptive management.

Assessment for HCV Attributes
Within the first phase of the HCV assessment, the National Framework provides a list of 19 questions (called elements in this report) that assist in determining whether individual attributes are HCVs. For each value, Al-Pac, with expert consultation, has defined thresholds for designating a High Conservation Value.

Overview of Engagement
FSC-certified companies must work cooperatively with interested parties (e.g., Environmental Non-Government Organizations (ENGOs), other stakeholders, and Indigenous Peoples) toward achievement of FSC Principle 9 - High Conservation Values.

Indicator 9.1.2 directs the assessment of HCVs through engagement with "Indigenous Peoples, and affected stakeholders and interested stakeholders… the assessment also uses input from qualified (technical and/or scientific) specialists" while Indicators 9.2.3 and 9.4.2 require similar engagement around the development of management and monitoring strategies.

It was determined that the most efficient approach to engagement of both Indigenous Peoples and interested and affected stakeholders was via the Al-Pac Landscape Advisory Group (LAG), as many stakeholders who may have an interest in High Conservation Values are members of the LAG. Al-Pac staff also reached out to other stakeholders who may have an interest in High Conservation Values, but who do not participate on the LAG, including municipalities, recreational clubs, outfitters and watershed societies. Tables 2 and 3 outline the stakeholders

and Indigenous Peoples that were engaged during the original reassessment completed in 2020 and that will be engaged during the 2025 Reassessment.

Table 2. List of stakeholders engaged in the designation, management and monitoring of HCVs.

Stakeholder
Alberta Professional Outfitters Society
Alberta Trappers Association
Crooked Creek Conservation Society of Athabasca
Alberta Fish and Game Association
Alberta Wilderness Association
Baptiste and Island Lakes Stewardship Society
Athabasca Watershed Council
Athabasca River Runners Club
Fort McMurray Sno-Drifters
Alberta Chapter of the Wildlife Society
Canadian Parks and Wilderness Society
Ducks Unlimited Canada
Land Stewardship Centre of Canada
S11 Logging
Ed Bobocel Lumber Ltd.
Northland Forest Products Limited
Vanderwell Contractors (1975) Ltd.
West Fraser Slave Lake
Lac La Biche County
Regional Municipality of Wood Buffalo
Town of Athabasca
County of Athabasca
Municipal District of Opportunity
MD of Lesser Slave River No. 124
Alberta Environment and Parks
Alberta Agriculture and Forestry
Alberta Plywood
Calling Lake, Alberta Community Members
Caslan, Alberta Community Members
Athabasca, Alberta Community Members
Edmonton, Alberta Community Members
Fort Chipewyan Community Members

Table 3. List of Indigenous Communities given an opportunity to engage in the designation, management and monitoring of HCVs

Métis Nation of Alberta- Region 1
Métis Local- Fort McMurray
Peerless Trout First Nation
Bigstone Cree Nation
Athabasca Chipewyan First Nation
Beaver Lake Cree First Nation
Chipewyan Prairie Dene First Nation
Cold Lake First Nation
Fort McKay First Nation
Fort McMurray First Nation #468
Goodfish/Whitefish Lake First Nation
Heart Lake First Nation
Mikisew Cree First Nation
Peavine Métis Settlement
Kikino Métis Settlement
Buffalo Lake Métis Settlement
Gift Lake Métis Settlement
Whitefish Lake First Nation
Saddle Lake First Nation

As a first step, all stakeholders and Indigenous Peoples with traditional territory that overlapped the Al-Pac FMA area were informed about the project in September 2019 and were invited to provide information on the presence, status and likelihood of occurrence of High Conservation Values in the FMA area.

In December 2019, Al-Pac presented an initial list of HCVs with a request for feedback on the presence, status and likelihood of occurrence of the HCVs, and invited participants to identify additional values for consideration as HCVs.

Engagement on management and monitoring strategies was planned for March 2020, but these meetings were postponed due to COVID 19. In lieu of being able to meet in person, information on the management strategies and monitoring plans was sent to Indigenous communities and stakeholders via email in May 2020.

Specific details on meetings held regarding HCVs are listed below:

Table 4. HCV Project engagement activities with Indigenous communities and stakeholders.

Date	Indigenous Community or Stakeholder	Meeting Purpose
August 2019	Canadian Parks and Wilderness Society (Northern Alberta Chapter) and Ducks Unlimited Canada	Organizations were informed about the project and were invited to provide information on the presence, status and likelihood of occurrence of High Conservation Values in the FMA area using culturally appropriate engagement strategies
September 2019	Al-Pac Landscape Advisory Group	Participants were informed about the project and were invited to provide information on the presence, status and likelihood of occurrence of High Conservation Values in the FMA area using culturally appropriate engagement strategies
	Athabasca Chipewyan First Nation Fort McKay First Nation Fort McMurray First Nation #468 Mikisew Cree First Nation Beaver Lake Cree Nation Goodfish/Whitefish Lake First Nation Heart Lake First Nation Chipewyan Prairie Dene First Nation Cold Lake First Nation	
	Bobocel Northland Forest Products	
November 2019	Crooked Creek Conservation Society of Athabasca Alberta Fish and Game Alberta Wilderness Association Baptiste and Island Lake Watershed Society Athabasca Watershed Council	Organizations were informed about the project and were invited to provide information on the presence, status and likelihood of occurrence of High Conservation Values in the FMA area
December 2019	Métis Nation of Alberta Region 1	Participants were informed about the project and were invited to provide information on the presence, status and likelihood of occurrence of High Conservation Values in the FMA area using culturally appropriate engagement strategies. Presentation of the initial list of HCVs and request for feedback on the presence, status and likelihood of occurrence of the identified HCVs, and for identification of additional HCVs
	Vanderwell West Fraser Slave Lake Lac La Biche County	Organizations were informed about the project and were invited to provide information on the presence, status and likelihood of occurrence of High Conservation Values in the FMA area; presentation

Date	Indigenous Community or Stakeholder	Meeting Purpose
	Town of Athabasca County of Athabasca Municipal District of Opportunity	of the initial list of HCVs and request for feedback on the presence, status and likelihood of occurrence of the identified HCVs, and for identification of additional HCVs
	Al-Pac Landscape Advisory Group	Presentation of the initial list of HCVs and request for feedback on the presence, status and likelihood of occurrence of the identified HCVs, and for identification of additional HCVs (in person meeting)
	Athabasca Chipewyan First Nation Fort McKay First Nation Fort McMurray First Nation #468 Mikisew Cree First Nation Beaver Lake Cree Nation Goodfish/Whitefish Lake First Nation Heart Lake First Nation Chipewyan Prairie Dene First Nation Cold Lake First Nation	Presentation of the initial list of HCVs and request for feedback on the presence, status and likelihood of occurrence of the identified HCVs, and for identification of additional HCVs (via email)
	Crooked Creek Conservation Society of Athabasca Alberta Fish and Game Alberta Wilderness Association Baptiste and Island Lake Watershed Society Athabasca Watershed Council	
January 2020	Regional Municipality of Wood Buffalo MD of Lesser Slave River No. 124	Municipalities were informed about the project and were invited to provide information on the presence, status and likelihood of occurrence of High Conservation Values in the FMA area; presentation of the initial list of HCVs and request for feedback on the presence, status and likelihood of occurrence of the identified HCVs, and for identification of additional HCVs
February 2020	Bigstone Cree Nation	Community was informed about the project and were invited to provide information on the presence, status and likelihood of occurrence of High Conservation Values in the FMA area
	Al-Pac Landscape Advisory Group Alberta Professional Outfitters Society Alberta Wilderness Association Baptiste and Island Lake Watershed Society	Draft report with the initial list of HCVs and request for feedback on the presence, status and likelihood of occurrence of the identified HCVs, and for identification of additional HCVs was sent via email

Date	Indigenous Community or Stakeholder	Meeting Purpose
	Athabasca Watershed Council Athabasca River Runners Club Ft. McMurray Sno Drifters	
March 2020	Bigstone Cree Nation Peerless Trout First Nation Athabasca Chipewyan First Nation Fort McKay First Nation Fort McMurray First Nation #468 Mikisew Cree First Nation Beaver Lake Cree Nation Goodfish/Whitefish Lake First Nation Heart Lake First Nation Chipewyan Prairie Dene First Nation Cold Lake First Nation Métis Nation of Alberta Region 1	Meetings were planned to share and solicit feedback on the management and monitoring strategies (meetings postponed at request of communities due to COVID 19)
May 2020	Athabasca Chipewyan First Nation Fort McKay First Nation Fort McMurray First Nation #468 Mikisew Cree First Nation Beaver Lake Cree Nation Goodfish/Whitefish Lake First Nation Heart Lake First Nation Chipewyan Prairie Dene First Nation Cold Lake First Nation Bobocell Vanderwell Northland Forest Products West Fraser Slave Lake Alberta Professional Outfitters Society (Colin Paly) Alberta Wilderness Association Baptiste and Island Lake Watershed Society Athabasca Watershed Council Lac La Biche County Town of Athabasca	HCVs, and proposed management and monitoring strategies shared with via email, request for input

Date	Indigenous Community or Stakeholder	Meeting Purpose
	County of Athabasca Municipal District of Opportunity Alberta Fish and Game Crooked Creek Conservation Society of Athabasca Regional Municipality of Wood Buffalo MD of Lesser Slave River No. 124	
June 2020	Saddle Lake First Nation Whitefish Lake First Nation	Communities were informed about the project and were invited to provide information on the presence, status and likelihood of occurrence of High Conservation Values, and their management and monitoring strategies in the FMA area using culturally appropriate engagement strategies, via email
July 2020	Métis Nation of Alberta Region 5 Gift Lake Métis Settlement Peavine Métis Settlement Buffalo Lake Métis Settlement Kikino Métis Settlement	Communities were informed about the project and were invited to provide information on the presence, status and likelihood of occurrence of High Conservation Values, and their management and monitoring strategies in the FMA area using culturally appropriate engagement strategies, via email and phone calls
September 2020	Métis Nation of Alberta Region 1 Buffalo Lake Métis Settlement Al-Pac Landscape Advisory Group	Communities and LAG members were provided a brief questionnaire to guide their input on HCVs and their management and monitoring strategies
October 2020	Al-Pac Landscape Advisory Group	Online meeting held for LAG members to solicit input on HCVs and their management and monitoring strategies

SECTION ON 2025 REASSESSMENT ENGAGEMENT TO BE ADDED ONCE COMPLETED.

HCV Designation Decision by the Manager
Under the FSC system, the forest manager makes the final designation of HCVs. In this case, the role of manager, and decision maker, was shared between the members of the Al-Pac HCV Team. The team used and considered input from qualified specialists; Indigenous Peoples and interested and affected stakeholders in their decision. A summary of the credentials of the HCV team are provided in Appendix 4.

Peer Review
In Appendix 5 is the full peer review of this report as required by the FSC Standard. The review process uses the HCV Resource Network Guidance for Peer Review of HCV Assessment Reports (Version 2.1 September 2010).

Keeping HCVs Up to Date – Process
High Conservation Values and their associated management strategies will be reviewed annually as part of the HCV monitoring process. This review will also include an assessment of the HCV Assessment Report's alignment with Al-Pac's forest management planning processes, the Alberta Timber Harvest Planning and Operating Ground Rules and the associated Northeast Alberta Regional Area-Specific Addendum, hereafter referred to as "Operating Ground Rules", as well as best management practices identified through a continuous improvement and adaptive management focus.

As well, Al-Pac is open to changes when new values are identified at any time, consistent with their adaptive management approach.

The Al-Pac FMA Forest Description

The Forest Management Agreement (FMA) area lies within the pan-northern boreal forest, and is situated in northeastern Alberta adjoining the border with Saskatchewan (Figure 2). The boreal forest is the largest forest in the world, and comprises the majority of Canada's and Alberta's forest landbase. The forest in the FMA area is complex, dynamic, and diverse -- spatially, compositionally, temporally and structurally. Wildfire has been and continues to be the primary agent of disturbance and renewal. The forest comprises a broad range of ecosystems with various forest successional stages represented by pure deciduous (Aspen, Balsam Poplar, and White Birch) stands, variably mixed deciduous-conifer or conifer-deciduous stands, and nearly pure coniferous (White Spruce, Black Spruce and Jack Pine) stands. The dominant commercial species (Aspen, White Spruce and Jack Pine) provide fibre and timber for the forest products industry and thus are important to the economic sustainability of the region's communities and mills. These species also play important roles in the region's biological diversity and ecological health. The non-harvestable landscape provides critical habitat for a multitude of waterfowl, reptiles, amphibians, furbearers, migratory songbirds, Woodland Caribou and numerous other ungulates and mammals.

The largest forest company in the FMA area is Alberta-Pacific Forest Industries Inc. (Al-Pac), which operates a Kraft pulp mill and holds the FMA tenure. There are also eight conifer Quota Holders (QHs) within the FMA area, the majority of which operate sawmills in the region). Many of these QHs have been in existence since the original Agreement was signed in 1992. The forest companies that operate within the Alberta-Pacific Forest Management Agreement area are licensed by the Provincial Government to sustainably harvest trees on 6.8 million hectares.

Forest Management Plan
The forest management planning system for Alberta's forests is based on a forest policy and legal framework that requires sustainability, public involvement, Indigenous involvement, and adaptive management. An overview of the system is provided in Appendix 1. Alberta Forest Management Planning System Overview. Plans are publicly available (FMP).

Appendix 1. Alberta Forest Management Planning System Overview contains a description of the Alberta forest management planning system which may be useful for readers not familiar with the Alberta terminology and hierarchy of planning. In this HCV report, how operations are to be conducted near High Conservation Values is described in the Operating Ground Rules. These will be referred to during this report. Appendix 1 puts the ground rules into the context of the overall planning system.

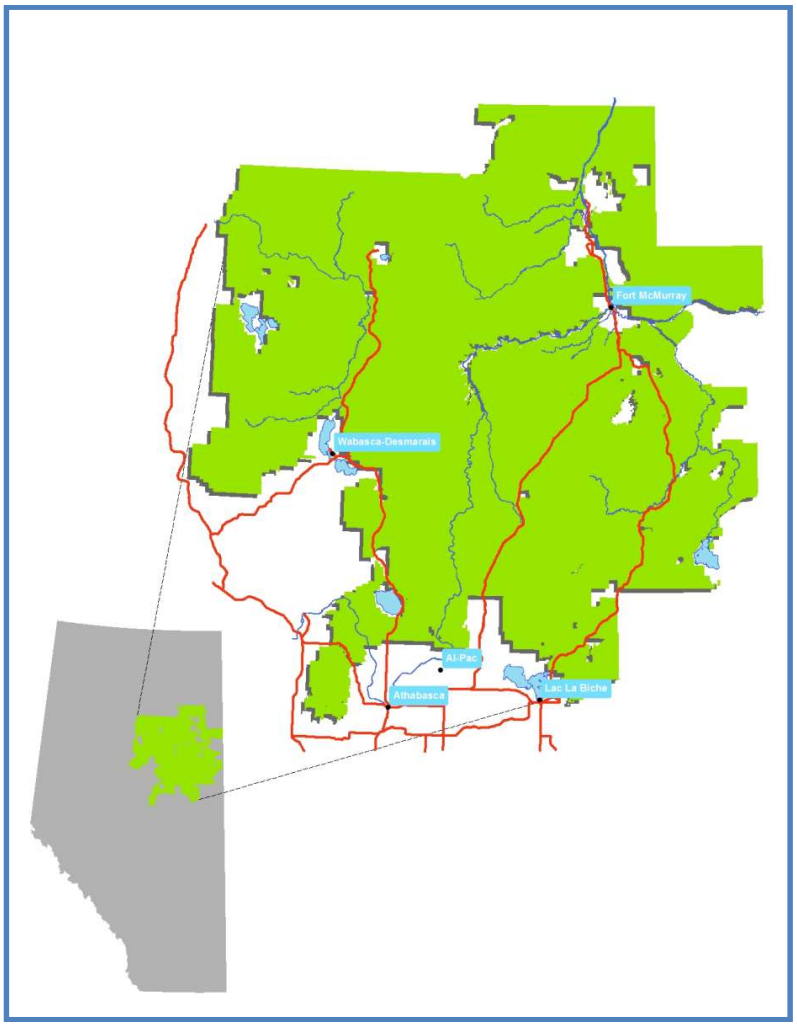

Figure 2. Location of the Al-Pac FMA area.

Phase 1: Process for assessing for the presence of HCV attributes

The following assessment for the presence of HCV attributes is based on the 19 questions (called elements here) posed by the National HCV framework divided into six categories related to the definition of HCV.

Table 5. National Framework process for assessing the presence of HCV attributes.

Category 1: "…significant concentrations of biodiversity values."

1. Does the forest contain species at risk or potential habitat of species at risk as listed by international, national or territorial/provincial authorities?
2. Does the forest contain endemic species?
3. Does the forest include critical habitat containing globally, nationally or regionally significant seasonal concentrations of species (one or several species e.g. concentrations of wildlife in breeding sites, wintering sites, migration sites, migration routes or corridors – latitudinal as well as altitudinal)?
4. Does the forest contain critical habitat for regionally significant species (e.g. species declining regionally)?
5. Does the forest support concentrations of species at the edge of their natural ranges or outlier populations?
6. Does the forest lie within, adjacent to, or contain a conservation area: a) designated by an international authority; b) legally designated or proposed by relevant federal/provincial/territorial legislative body, or c) identified in regional land use plans or conservation plans?

Category 2. "…large landscape level forests…"

7. Does the forest constitute or form part of a globally, nationally or regionally significant forest landscape that includes populations of most native species?

Category 3 "…rare threatened or endangered ecosystems."

8. Does the forest contain naturally rare ecosystem types?
9. Are there ecosystem types within the forest or ecoregion that have significantly declined or under sufficient present and / or future development pressure that they will likely become rare in the future (e.g. old seral stages)?
10. Are large landscape level forests (i.e. large unfragmented forests) rare or absent in the forest or ecoregion?
11. Are there nationally/regionally significant diverse or unique forest ecosystems or forests associated with unique aquatic ecosystems?

Category 4 "…basic services… watershed protection"

12. Does the forest provide a significant source of drinking water?
13. Are there forests that provide a significant ecological service in mediating flooding and/or drought, controlling stream flow regulation, and water quality?
14. Are there forests critical to erosion control?
15. Are there forests that provide a critical barrier to destructive fire (in areas where fire is not a common natural agent of disturbance)?
16. Are there forest landscapes (or regional landscapes) that have a critical impact on agriculture or fisheries?

Category 5 "…meeting basic needs of local communities."

17. Are there local communities? (This should include both people living inside the forest area and those living adjacent to it)

Category 6 "…communities' local cultural identity…"

18. Is the traditional cultural identity of the local community particularly tied to a specific forest area?
19. Is there a significant overlap of values (ecological and/or cultural) that individually did not meet HCV thresholds, but collectively constitute HCVs?

Category 1) Forest areas containing globally, nationally or regionally significant concentrations of biodiversity values.

1) Does the forest contain species at risk or potential habitat of species at risk as listed by international, national or territorial/provincial authorities?

Rationale:

Ensures the maintenance of vulnerable and/or irreplaceable elements of species diversity. This indicator allows for a single species or a concentration of species to meet HCV thresholds.

Assessment Methodology:

- Species at risk public registry
- Species assessed by the conservation committee: Alberta species at risk
- Alberta Wildlife Regulation – Schedule 6
- IUCN Red List
- File: Species at Risk on Alpac FMA area 2010_2024 FSC 6.4.1 Updated March 2024.pdf

Consultation with experts included discussion with Al-Pac biologists and local biologists. A list of species at risk (SAR) on the Al-Pac FMA area is maintained and updated annually. This list includes all species present on the FMA area that are legally listed on Schedule 1 of the federal *Species at Risk Act* and Schedule 6 of Alberta's *Wildlife Regulation* (created under the *Wildlife Act*). Additionally, any species recommended for listing as Endangered, Threatened, or Special Concern by the federal (Committee on the Status of Endangered Wildlife in Canada, COSEWIC) or provincial (Endangered Species Conservation Committee, ESCC) assessment bodies, but not yet legally listed, are also included on this list.

Assessment Results:

Species extinctions begin with loss in abundance of individuals. Rosenberg et al. (2019, see References) reported population losses of 29% over 48 years across much of the North America. Losses such as this can result in functional changes to ecosystems. This HCV assessment starts with species at risk because species are the building blocks of biodiversity and ecosystems.

Table 6 provides a list of all species listed as Special Concern, Threatened, or Endangered that occur on the forest. Regulated (listed) species, as well as any species recommended for listing by COSEWIC or ESCC but not currently legally listed, are considered to be HCVs. The list is available in the federal Species at Risk Public Registry and Alberta's Wildlife Regulation (Schedule 6).

Species rankings provided by the International Union for the Conservation of Nature (IUCN) were included in the table because they give a more global context to the local rankings. Species ranked by the IUCN tend to be less “at risk” because the global distribution is factored in. This does not minimize the responsibility of the province or the forest company, because range shrinkage is the hallmark of species in trouble.

Table 6 is based primarily on consultation with Al-Pac biologists / ecologists in the FMA area who supplied the basic list from federal and provincial government sources.

During assessment of individual species, values are designated as HCV, or possible HCV. The use of the designation “possible HCV” is intended to ensure the forest company is only asked to manage and monitor actual HCV occurrences on the forest. Some HCVs are likely to occur but are hard to locate. Forest companies have limited responsibility for grassland and aquatic species which do not occur near operations. In cases where there is no management prescription required for a value, the company does not have a direct responsibility. The HCVs are listed here for transparency and maintaining an awareness of the values near the forest.

Table 6. Species listed as "at risk" by COSEWIC or Alberta Government with records of occurrence on the Al-Pac FMA area, as verified by local biologists.

Species	Status 2024	Status Report	Recovery Plan	Critical Habitat ID?	ABMI Intactness 2020	Habitat Association	Forest Management Considerations
Amphibians							
Western Toad	SSC-Can	COSEWIC 2012	Yes	No	Not Avail	Aquatic habitat generalist	Riparian buffers to reduce disturbance risk.
Arthropods							
Transverse Lady Beetle	SSC-COWEWIC	COSEWIC 2016	No	No	Not Avail	Open habitat generalist	Low Risk
Yellow-banded Bumble Bee	SSC-Can	COSEWIC 2015	No	No	Not Avail	Generalist	Maintain habitat through space and time across FMA area through NRV-based management.
Birds							
Bank Swallow	T-Can	COSEWIC 2016	2021 (Proposed)	No	Not Avail	Vertical banks	Low Risk
Barn Swallow	T-Can; SSC-COSEWIC	COSEWIC 2011, 2021	Not Avail	No	97.9	Open land and forest clearings; nest on buildings/bridges	Inspect bridges for nests and avoid repairs and maintenance during breeding season unless dictated by safety or logistical constraints.
Barred Owl	SSC-AB	2005	AB-2016	No	Not Avail	Mature/old mixedwood forests	Maintain habitat through space and time across FMA area through NRV-based management. Maintain large deciduous snags.
Bay-breasted Warbler	Recommend SSC-AB	2001	2014	No	85.5	Old mixed conifer-leading/deciduous forests	Maintain habitat through space and time across FMA area through NRV-based management.
Black-throated Green Warbler	SSC-AB	1999	2014	No	75	Old mixed deciduous/coniferous forests	Maintain habitat through space and time across FMA area through NRV-based management.

Species	Status 2024	Status Report	Recovery Plan	Critical Habitat ID?	ABMI Intactness 2020	Habitat Association	Forest Management Considerations
Canada Warbler	T-Can; SSC-COSEWIC	AB-2014 Can-2008	Can 2016	No; Schedule of Studies to 2021	85.3	Old deciduous forests	Maintain habitat through space and time across FMA area through NRV-based management.
Cape May Warbler	Recommend SSC-AB	2001	2014	No	90.2	Old conifer-leading forests	Maintain habitat through space and time across FMA area through NRV-based management.
Common Nighthawk	SSC-Can	2018	Can 2016	No; Schedule of Studies to 2023	98.1	Open land and forest clearings	Low Risk
Evening Grosbeak	SSC-Can	COSEWIC 2016	No	No	93	Mature mixedwood forests	Maintain habitat through space and time across FMA area through NRV-based management.
Horned Grebe	SSC-Can	2009	Can Mgmt Plan 2021 (Proposed)	No	Not Avail	Open water bodies	Riparian buffers to reduce disturbance risk.
Lesser Yellowlegs	T-COSEWIC	n/a	No	No	Not Avail	Treed fens, open water, black spruce, pine, white spruce	Riparian buffers to reduce disturbance risk.
Olive-sided Flycatcher	SSC-Can	2018	Can 2016	No; Schedule of Studies to 2022	98.1	Open or mixed conifer forests, often in association with wetlands; also post-burn areas	Maintain habitat through space and time across FMA area through NRV-based management.
Rusty Blackbird	SSC-Can	2017	Can 2015	No	99	Boreal wetlands	Riparian buffers to reduce disturbance risk
Short-eared Owl	SSC-Can; T-COSEWIC	COSEWIC 2008		No	Not Avail	Open habitat within southern boreal forest	Low Risk

Species	Status 2024	Status Report	Recovery Plan	Critical Habitat ID?	ABMI Intactness 2020	Habitat Association	Forest Management Considerations
Trumpeter Swan	SSC-AB	2013	2013	No	Not Avail	Open waterbodies	Implement Operating Ground Rules (OGR) section 2.8.4-2.8.6 to reduce disturbance risk.
Western Grebe	T-AB SSC-Can	2014	Not Avail.	No	Not Avail	Open water bodies	Riparian buffers to reduce disturbance risk
White-winged Scoter	SSC-AB	2002	2012	No	Not Avail	Open water bodies	Riparian buffers to reduce disturbance risk
Yellow Rail	SSC-Can	2010	2013	No	Not Avail	Boreal wetlands (particularly graminoid fens)	Riparian buffers to reduce disturbance risk
Fish							
Arctic Grayling	SSC-AB	2015	Not Avail.	No	Not Avail	Found in various streams/rivers on Al-Pac FMA area	Riparian buffers to reduce disturbance risk. Stream-crossing best management practices to reduce risk of sedimentation into streams.
Brassy Minnow	SSC-COSEWIC	AB 2015	N/A	No	Not Avail	Spawn in shallow areas of lakes/streams. Pop distribution largely unknown but small, isolated reports in Athabasca River & tributaries near Ft McMurray in 1970s.	Low Risk; unlikely to occur within FMA in recent decades, and forestry not implicated in population declines
Mammals							
Eastern Red Bat	E-COSEWIC	2023	N/A	No	Not Avail	Roosting trees in forest	Low/no forestry risk, but forest management strategies to maintain snags as roosting trees are a best practice.

Species	Status 2024	Status Report	Recovery Plan	Critical Habitat ID?	ABMI Intactness 2020	Habitat Association	Forest Management Considerations
Hoary Bat	E-COSEWIC	2023	N/A	No	Not Avail	Roosting trees in forest	Low/no forestry risk, but forest management strategies to maintain snags as roosting trees are a best practice.
Little Brown Myotis	E-Can	Can-2014	2018	Yes; none on Al-Pac FMA area	Not Avail	Forest habitat associations for boreal plain not well understood; old aspen and white spruce snags used by bats in Ontario	Emergency listing driven by white-nosed syndrome where risk is primarily associated with caves. From a forestry perspective; follow structure/ snag retention protocols (see OGR section 4.2.4)
Northern Myotis	E-Can	Can-2013	2018	Yes; none on Al-Pac FMA area	Not Avail	Forest habitat associations for boreal plain not well understood; old aspen and white spruce snags used by bats in Ontario	Emergency listing driven by white-nosed syndrome where risk is primarily associated with caves. From a forestry perspective; follow stand structure/ snag retention protocols (see OGR section 4.2.4)
Silver-haired Bat	E-COSEWIC	2023	N/A	No	Not Avail	Roosting trees in forest	Low/no forestry risk, but forest management strategies to maintain snags as roosting trees are a best practice.
Wolverine	SC - CAN	2014	N/A	No	Not Avail	Variety of forest types; study in FMA found most dens in old black spruce lowlands. Harvest area edges may provide foraging opportunities	Buffer dens by 100m (OGR 2.8.9). Maintain habitat through space and time across FMA area through NRV-based management.
Wood Bison	T – Can; T-AB	COSEWIC 2013 SC	Can 2018; AB in development	No; Schedule of Studies to 2021	Not Avail	Research underway through GOA/U of A	Low Risk

Species	Status 2024	Status Report	Recovery Plan	Critical Habitat ID?	ABMI Intactness 2020	Habitat Association	Forest Management Considerations
Woodland Caribou	T-AB/Can	AB-2010; Can-2014	AB-2005; Can-2012	Yes; 35% disturbance threshold in caribou range	Not Avail	Primarily treed bogs/fens, some use of pine forest	See Al-Pac Caribou Conservation Strategy, and OGR sections 2.8 and 4.2.6.

Note that the ranking is linked to the Alberta Wildlife Act (Schedule 6 of the Wildlife Regulation) and all designations should reflect those regulatory requirements. This table was updated with species legally listed, as well as all species assessed by the Alberta's Endangered Species Conservation Committee (ESCC) and its Scientific Subcommittee (SCC) as of January 2024. See the footnote* at the bottom of this table for links and details.

* E = Endangered T = Threatened SSC = Species of Special Concern AB = Alberta Can = Canada
COSEWIC = Committee on the Status of Endangered Wildlife in Canada

Status information generated using NatureServe terms and methodology for vertebrates, invertebrates, and plants is generated by the Alberta Conservation Information Management System of Alberta Parks. To access plant and invertebrate species status information, see:

- Alberta Conservation Information Management System
- Wild Species: The General Status of Species in Canada

FSC Manager's list for Species at Risk *(*Table 6*) presents the current assessment of SAR based on understanding of these species on the Al-Pac FMA area. This table is also the manager's list as required in indicator 6.4.1 of the FSC National Forest Stewardship Standard of Canada. The following information is a supplement to the brief discussion in the above table.*

Landscape Driven Biodiversity
Woodland Caribou require large, undisturbed treed peatlands (bogs and fens) to serve as refugia from predators, mainly wolves. However, the proliferation of seismic lines and other linear features (including winter forestry roads) into these peatlands enables wolf access, thereby reducing the ability of these areas to serve as refuges. Thus, although the overall areal extent of seismic lines is relatively small, caribou are particularly susceptible to the changes in wolf distribution that follow linear feature proliferation. In addition, even though Al-Pac does not harvest within these treed peatlands, the creation of younger forest through harvest activities in upland areas can increase the local populations of other ungulates (white-tailed deer and moose) that will in turn support higher wolf populations, increasing the risk to caribou, even though caribou are not the primary prey species of wolves. Climate change is also a dominant factor in the ongoing northward range expansion of white-tailed deer, which were historically not present in the boreal forest. Therefore, the cumulative effects of landscape-scale industrial development and climate change result in a variety of complex changes to both the landscape and the predator-prey system, with repercussions for caribou. Caribou and Al-Pac's management approach are further discussed below in the Woodland Caribou section of Element 4 – Regionally Significant Species.

HCV Designation Decision:
Listed species at risk are designated HCV[4] based on a review of current status of species at risk, as rated by provincial and national agencies.

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2) Does the forest contain a globally, nationally or regionally significant concentration of endemic species?

Rationale:
To ensure the maintenance of vulnerable and/or irreplaceable elements of biodiversity.

Endemic refers to species that are unique to a defined geographic location, such as an island, nation, other defined zone, or habitat type.

Assessment Methodology:

- Birdlife International
- IUCN; Nature Serve; Conservation International
- Terrestrial Ecoregions of North America: A Conservation Assessment

The presence of any endemic species identified by an appropriate agency (e.g. Alberta Conservation Information Management System - ACIMS, or COSEWIC) would meet the threshold of this criterion.

Assessment Results:
While endemism is sometimes misunderstood to mean that a species simply occurs in an area, this is an incorrect definition. As with most boreal forests, which have evolved with both short- (fire and wind) and long-term disturbance (continental glaciers), endemism is rare. Moreover, the public forests of Canada consist of a huge expanse of contiguous forest cover over the landscape that

[4] This designation was reviewed in March 2024, including a review of the web info and other sources.

does not inhibit genetic mixing. In general, these conditions prevent endemism. Some endemics can be caused by species that have been extirpated everywhere else, such as the Whooping Crane from northern Canada, but there are no occurrences in this forest.

Birdlife International does not show any Endemic Bird Areas in Canada, nor does Conservation International identify any biodiversity "Hotspots" in the country.

In their book "Terrestrial Ecoregions of North America", Ricketts et al. (1999) provided an analysis of the geographic patterns of species richness and endemism and a series of maps for illustration. According to Ricketts et al., boreal species are widely distributed and endemism is not a factor in these forests.

HCV Designation Decision:
At this time, there are no known endemic species on the forest[5].

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3) Does the forest include critical habitat containing globally, nationally or regionally significant seasonal concentrations of species (one or several species e.g. concentrations of wildlife in breeding sites, wintering sites, migration sites, migration routes or corridors – latitudinal as well as altitudinal)?

Rationale:
Addresses wildlife habitat requirements critical to maintaining population viability (regional "hotspots").

Assessment Methodology:

- Forest Management Plan
- Landscape Advisory Group and stakeholder engagement; Al-Pac staff
- BirdLife International; Conservation International -- Important Bird Areas
- IBA Canada
- Ducks Unlimited Canada (DUC)
- Western Hemisphere Shorebird Reserve Network
- Government of Alberta

Various mapped information sources were used to determine wildlife concentration areas such as critical breeding or winter habitat for a single species or concentration areas for a diversity of species as they are identified in the field. Information recorded in the FMP with regard to special wildlife management areas is an important source of information for assessment of critical habitat.

Assessment Results:
Bird Areas
According to Bird Studies Canada, an Important Bird Area (IBA) is a site providing essential habitat for one or more species of breeding or non-breeding birds. These sites may contain threatened species, endemic species, species representative of a biome, or highly exceptional concentrations of birds. IBA Canada identifies the Pelican Lake IBA which is entirely within the FMA area, and three others (Utikuma and Utikumasis Lakes, Lakeland, and Lac La Biche) which are adjacent to the FMA area (Figure 3).

[5] This designation was reviewed in November 2019, including a review of the web info and other sources. No new information to revise this assessment has emerged since that time.

Ducks Unlimited Canada's (DUC) benchmark for special bird areas is wetlands that are over 500 hectares in size containing over 5,000 birds at a single survey. No such sites have been identified in the Al-Pac FMA area.
Large, intact wetlands provide critical molting and staging habitat for waterfowl, waterbirds, shorebirds and migratory landbirds. These wetlands provide security and abundant food resources for waterfowl during the vulnerable molting period. Large intact wetlands within the FMA area were identified from a list provided in the Alberta NAWMP (North American Waterfowl Management Plan) 2007-2012 Implementation Plan (Figure 3).

Small waterfowl production and small staging areas that do occur are not considered HCV. They are protected through Operating Ground Rules protection on water bodies. Risk of incidental loss of nests is discussed in this report in
Phase 2: Managing and Monitoring HCVs in Al-Pac FMA Area. Ducks Unlimited Canada has commented on this issue in several documents notably in their mitigation risk document, also called "Incidental Take".

Bird Colonies
Most large bird colonies are associated with large bodies of water. In the case of the Al-Pac FMA area, Pelicans do occur in a few isolated locations. They were designated HCV (Figure 3).

In some cases, Gulls and Terns can nest colonially on islands or lakeshores. There are no reports of colonies within the FMA area and none of these species were identified in the FMA area as regionally significant. As such, Gulls and Terns have not been designated HCVs.

Great Blue Herons are colonial nesters, especially vulnerable to human disturbance during the nesting season when, in some cases, large numbers of birds are concentrated in a relatively confined area. There were a few small heronries identified and designated as HCV (Figure 3).

Figure 3 lists the location of the above bird colonies, with non identifying information.
Note that Trumpeter Swans are listed in element 1 as species at risk and are included not on this map.

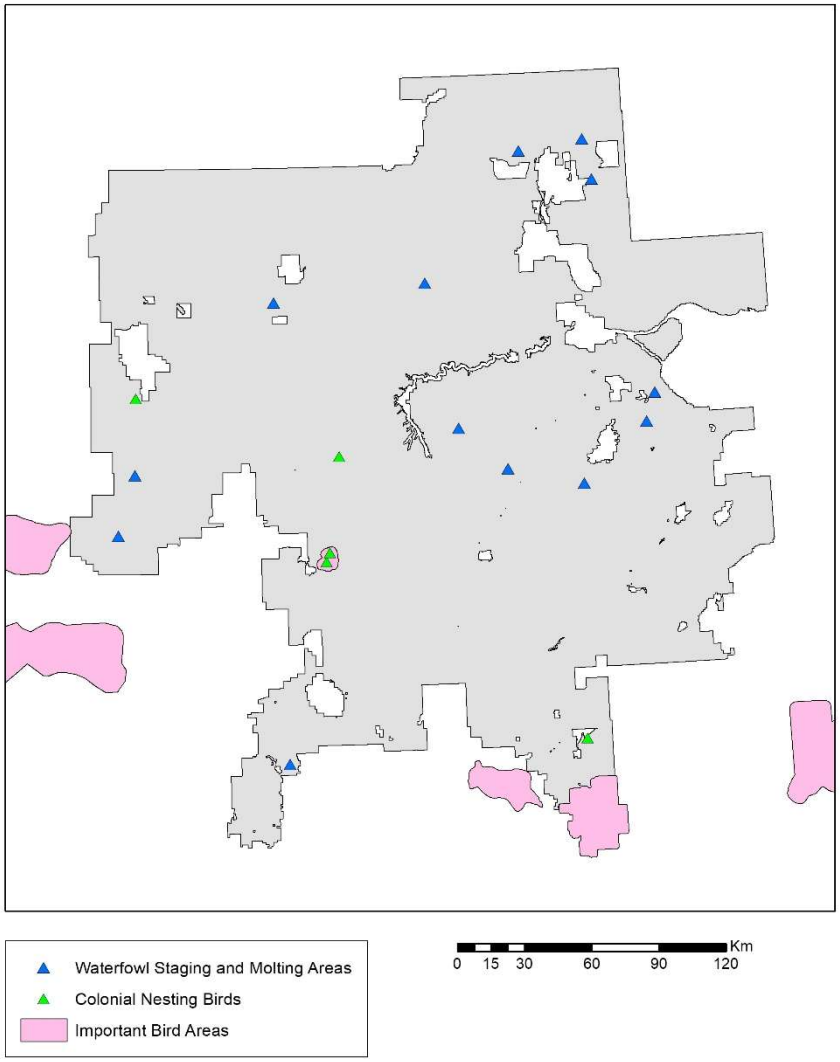

Figure 3. Important Bird Areas, Bird Colonies and Staging Areas in the Al-Pac FMA Area

Cervid Concentration Areas

In some parts of Canada, Cervids (members of the deer family) migrate and congregate seasonally. For example, Caribou migrations in the far north are one of nature's great migrations. In some parts of Canada with heavy snow, white-tailed deer will congregate in "deer yards" which are areas with more conifer cover for protection adjacent to hardwood for food. Alberta Environment and Parks has mapped "Key Wildlife and Biodiversity Zones" (KWBZ) in the province that include important ungulate winter range areas that include similar features such as river valley slopes providing shelter from wind, and areas of high forage potential (AESRD 2015). However, unlike "deer yards" that are geographically constrained, KWBZs exist across very large areas; in the FMA area, nearly 480,000 hectares are classified as KWBZ. Although these areas are important, they do not represent a significant concentration area due to the large geographic scope.

Critical Fish Spawning Areas

Fish-bearing streams are identified through stream assessments conducted by Al-Pac.

Arctic Grayling occurs in the FMA area and is a provincially designated species at risk. Over-fishing is considered a threat and roads facilitate human access to streams. Forestry is a concern

because of increased road access. This species is listed in Element 1 as an HCV. Although the spawning areas would qualify as concentration areas, and as such HCVs, the actual location of these have not been identified within the FMA area, because fish assessments typically do not occur during spawning season (early May soon after ice breakup). Grayling spawning habitat consists of low order, permanent streams with clean substrate (e.g. gravel), relatively shallow (~20-40cm) depth, a gradient of at least 0.5%, and flow velocity below 1 m/s (Stanislawski & Brown 1997; S. Stanislawski, personal communication). Although they do spawn in the FMA area, there are no records of the spawning areas in the FMA area, so Grayling is considered as a possible HCV.

The Al-Pac FMA area does not fall within the distribution of Lake Sturgeon.(COSEWIC). The closest occurrence is the North and South Saskatchewan River systems. It is not an HCV.

Walleye (*Sander vitreus*) is the main fish species of economic interest to the tourism industry. This species is widespread and managed through provincial sportfishing regulation, thus spawning sites were not designated as HCV.

Forest management activities have the potential to impact aquatic environments both positively and negatively. Government maintains strict rules about operations near critical fish habitat because of sedimentation risk. Besides risk from construction, road access can adversely affect fish populations due to increased access and angling pressure.

Forestry operations that occur in riparian zones and along shorelines, if not implemented properly, can result in increased risk for erosion, sedimentation, debris flow, elimination of shade and cover, temporary increases in water temperature and alteration of the forage base.

The FMP and Operating Ground Rules protect fisheries values and wetland ecosystem function by:

- Application of buffers to regulate forest management activities around streams and other watercourses
- Timing restrictions for water crossing installations
- Direction to conduct harvest operations within or adjacent to sensitive areas during winter only

Fish spawning areas in general, aside from species at risk such as Grayling, have not been identified as HCVs because spawning areas are abundant in the FMA area. The Government of Alberta ensures that a conservative approach to protection is employed through Operating Ground Rules for aquatic systems.

HCV Designation Decision:
Important Bird Areas, waterfowl staging and molting areas, and concentration areas (nest locations) for White Pelicans and Great Blue Herons are identified as HCVs[6].

Arctic Grayling is designated as an HCV in element 1 as a SAR, and as possible HCV in this element, because no spawning locations were confirmed.

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4) Does the forest contain critical habitat for regionally significant species (e.g. species representative of habitat types naturally occurring in the management unit, focal species, species declining regionally)?

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[6] This designation was reviewed in September 2016, including a review of the web info and other sources.

Rationale:
Meta-population viability.

Assessment Methodology:

- Results from Forest Management Plan habitat models
- Species representative of naturally-occurring habitat types or focal species
- Species identified as ecologically significant through consultation
- Alberta Conservation Information Management System (ACIMS)
- Environment Canada Scientific Assessment of Critical Habitat for Woodland Caribou

NOTE: Species identified in Alberta SAR databases and ranked nationally as SAR by COSEWIC were discussed in element 1.

Under this question, the HCV toolkit provides definitive (required) guidance that asks "Is the regionally significant species in significant decline as a result of forest management?". "Habitat for regionally significant species" means special places in the forest for species that may be important because they are rare, at risk, or economically or socially important. In this element is included focal species, featured species, landscape-driven species and regionally-representative species. These terms are defined below. The reasons for identifying these species may vary from regulatory requirements to subjective stakeholder opinion. If stakeholders have identified the species as significant, Al-Pac will do an HCV assessment following the HCV guidance provided in Annex D of the FSC National Forest Stewardship Standard of Canada. This element specifically mentions "declining species" which can be difficult to assess for some species. This is discussed below.

Caribou habitat is addressed in this element, because it is a declining species, a featured species, as well as being at risk (element 1). Caribou is also noted in other elements, but the primary discussion of caribou is in this element.

Determining critical habitat for regionally significant species can be addressed from both the landscape and site scales.

Assessment Results:
Focal Species
Focal species are species whose requirements for persistence define the attributes that must be present if a landscape is to meet the requirements of the other species that occur there (Lambeck 1997). In other words, this definition means that the species themselves have a role to play in maintaining ecosystem structure and function. The boreal is a fire-dominated ecosystem, rather than one that is stable and influenced by slower processes such as those caused by animals. For focal species, often their role is to exercise control on the forest cover. Abundant herbivores in more southern areas are capable of this. A related concept is "keystone" species which was defined by R. T. Paine (1966) as a species that plays a disproportionately large role in ecosystem function, relative to its numerical abundance or biomass.

Table 7. Fine-filter species on the Al-Pac FMA area, based on Government of Alberta (GOA)

Species	Source	Status (from Table 6)
Canada Warbler	FMP -Gov of Alberta selection	Threatened (Can)
Black-Throated Green Warbler	Gov of Alberta	Special Concern (AB)
Bay-Breasted Warbler	Gov of Alberta	SSC (AB – recommended)
Ovenbird	Gov of Alberta	Not At Risk
Brown Creeper	Gov of Alberta	Not At Risk
Barred Owl	Gov of Alberta	Special Concern (AB)
American Marten	Gov of Alberta	Not At Risk
Woodland Caribou	Gov of Alberta	Threatened (AB & Can)

This list was identified by the Government of Alberta as fine-filter species during FMP development. Some of these fine-filter species are SAR and are thus designated HCV in element 1 (Table 6 Species at Risk). The other species are common across the FMA area, and do not meet the definition of "focal species". There are no species on the list which reside in fragile ecosystems. Long-term habitat supply for these species is addressed in Timber Supply Analysis modelling as part of the FMP development (See FMP Volume 2: Timber Supply Analysis Annex; Al-Pac 2015). These species were not designated HCV here.

Featured Species

To evaluate this element, we also looked at the use of two concepts that are similar to "focal species" – "featured species" and "regionally representative species". Featured species (Thomas 1979) are species whose habitats, and sometimes populations, are managed for their importance to society, possibly as game species (e.g., Moose or Deer), focal species (e.g., Pileated Woodpecker), important furbearers (e.g., Marten), or for other reasons (e.g., at risk). Caribou is a featured species at risk that would also qualify under this category. It is a species of pre-eminent position in the forest and would also be designated here. The following sections discuss merits of designating these species as HCV, starting with landscape-driven species.

Landscape-Driven Species

Al-Pac operates within an ecosystem-based management framework, which is a management strategy that models forest harvest on the patterns of natural disturbances like forest fires. Fire has been the main natural disturbance that has shaped Alberta's boreal forests since the retreat of the Ice Age glaciers about 10,000 years ago. Plants, animals and ecosystems have adapted to forest fires that have swept through the forest every 40 to 150 years. Fire creates unique new habitats for wildlife and helps maintain the natural balance of young and old forests found in the Al-Pac FMA area. Al-Pac's approach at the stand level is to approximate the stand structure retained after forest fires by leaving, on average, five percent merchantable volume of trees standing in timber harvest areas. At the landscape scale, the strategy is to approximate natural disturbance patterns and the range of natural variation. This is described in more detail in the FMP.

The company has invested in research on fire and ecosystem-based management across the boreal forest landscape. The goal is to minimize the effects of the forest companies' harvesting operations and approximate the ecological benefits of fire by following the patterns of this natural disturbance as closely as possible. This research has investigated a number of aspects of fire ecology including:

- Frequency – how often does fire occur on a given piece of land?
- Size – what range of fire sizes occur on different parts of the FMA area?
- Intensity – how hot do the fires burn; what is the distribution and size of skips (patches of trees left unburned)?
- Biotic response – how do the plants, animals and insects respond to fires?

These characteristics of fire are now used by Al-Pac as a guideline for establishing the type, size and distribution of timber harvest areas and stand structure.

In addition to work done at the stand scale, Al-Pac has initiated landscape-level strategies to implement ecosystem-based management more effectively. Al-Pac's landscape level harvest approach is designed to maintain landscape patterns created by forest fires at broad scales while providing a continued fibre supply.

Studying natural disturbances, their differences and similarities to forest harvesting, and the associated responses of biodiversity to both is an ongoing process. By applying this knowledge, managers of the boreal forest will be able to reduce the differences between the two types of disturbance. The more harvesting practices and other human disturbances conform to natural variability, the more likely it is that a healthy ecosystem will be maintained.

Caribou are a featured species and dominate discussion of landscape management. Although it is also designated in element 1, its role as a landscape species influences the habitat of all species in its range. That is why it is designated as an HCV under this element as well.

Moose
Feedback received from community meetings, stakeholder groups, and Alberta Environment and Parks indicated that moose are likely the most valued wildlife species in the FMA area. They are an important focus of Indigenous and non-Indigenous hunting, have high viewing value, and have considerable value for guiding and outfitting businesses and related retailing. Because of the high interest in and value placed on moose, they were assessed for HCV status though this process. Moose occur throughout the FMA area. They are an adaptable species and are well suited to sites with abundant browse where forest succession has been set back by fire or by logging. Optimal moose habitat may occur where sufficient forest cover has been retained to maintain connectivity among important habitat features, such as conifer cover, shrub-land or newly generating forests, wetlands and riparian zones. Potential negative impacts of larger, aggregated harvest blocks on moose habitat are addressed through harvest area planning, which limits line-of-site and maintains connectivity of habitat through unharvested, retained stand structure.

Moose are a widely distributed, featured species and iconic across the boreal forest of Canada. They were not designated as an HCV because there was no geographical critical life requirement that was identified in the FMA area, such as congregation areas. As well, they are not a listed species. Management occurs though landscape management and the Operating Ground Rules related to Key Wildlife and Biodiversity Zones that represent areas of high quality moose winter range.

Woodland Caribou
Woodland Caribou are listed as a threatened species nationally and in Alberta, and their decline throughout their range has been correlated with human activities. Experts agree that land-use activities and climate change are affecting, either directly or indirectly, the population dynamics of caribou. Detailed information regarding Alberta's caribou distribution, population trends, and habitat requirements has been assembled in the draft Woodland Caribou Range Plan (Government of Alberta 2017). Al-Pac's approach to Caribou management includes strategic, planning, and operational components, including deferring harvest in large portions of caribou range (Figure 4), supporting caribou research, participating in government-led range planning processes, and restoring linear features. For details, refer to Al-Pac's Caribou Conservation Strategy (Al-Pac 2021).

Wolverine
Wolverines are often associated with Caribou through predation or scavenging of carrion. Wolverines occur in the FMA area but are not common; rather, they are an important species symbolically because they are iconic of wilderness. Wolverines do not play a significant role in driving landscape management or influencing other species. Although they are associated with Caribou, they are not a main driver of caribou populations in FMA area. Wolverines are designated as HCV in element 1, because they are a SAR, but they are not designated here because the FMA area is not known to contain critical habitat for wolverine.

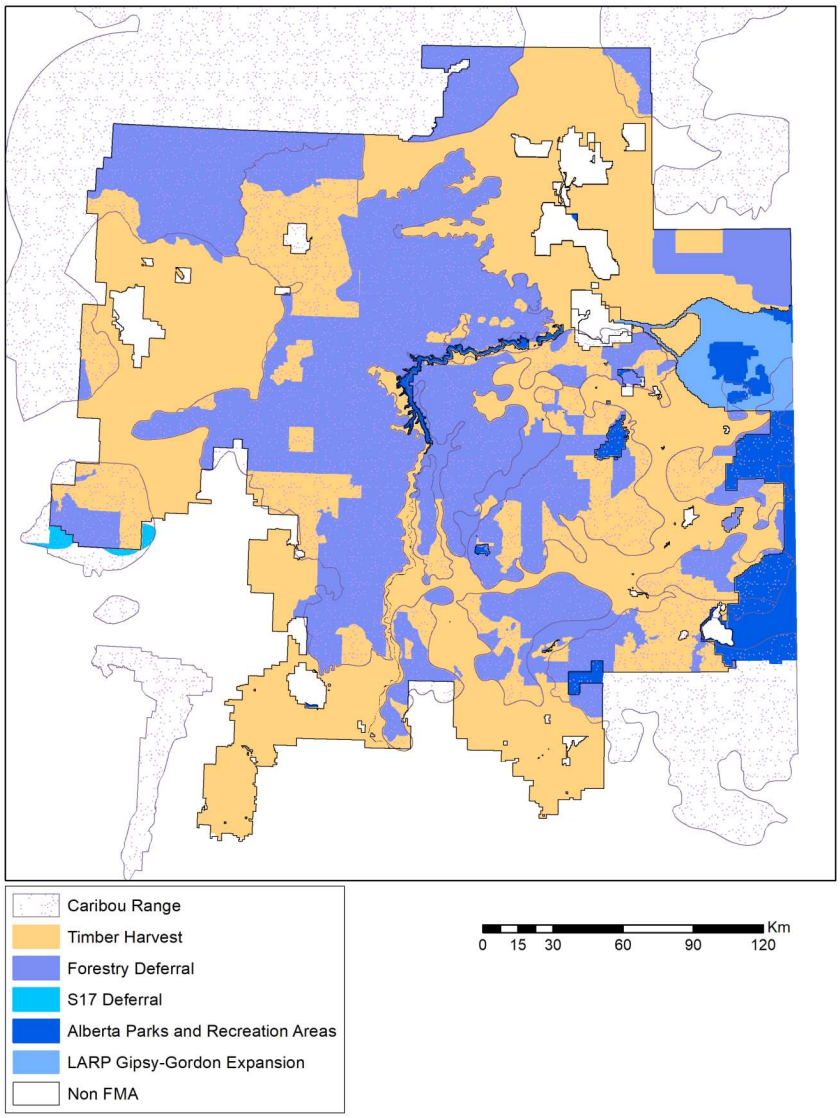

Figure 4. Long-term harvest deferrals within caribou range in the Al-Pac FMA Area.

Alberta Conservation Information Management System (ACIMS) Rare Species
A search of the ACIMS database for rare species (G3, S1-S3) found 4 non-vascular plants that occur in the Lower Boreal Highlands and Central Mixedwood natural subregions that comprise the majority of the FMA area (Table 7, Figure 5). No critical habitat is identified for these species, nor are they known to be locally at risk, or limited by habitat within the FMA area. For species like this,

normal conservation practices are implemented as guided by the Operating Ground Rules**.** None of the species were designated HCV.

Table 8. Rare plant species as determined by ACIMS

Scientific Name	Common Name	SRank	GRank
Hypocenomyce leucococca	Clam Lichen	S2	G3?
Phaeocalicium compressulum	Alder Needle Lichen	S1	G2G3
Botrychium crenulatum	Scalloped Grapefern	S3	G3
Botrychium pallidum	Pale Moonwort	S2	G3

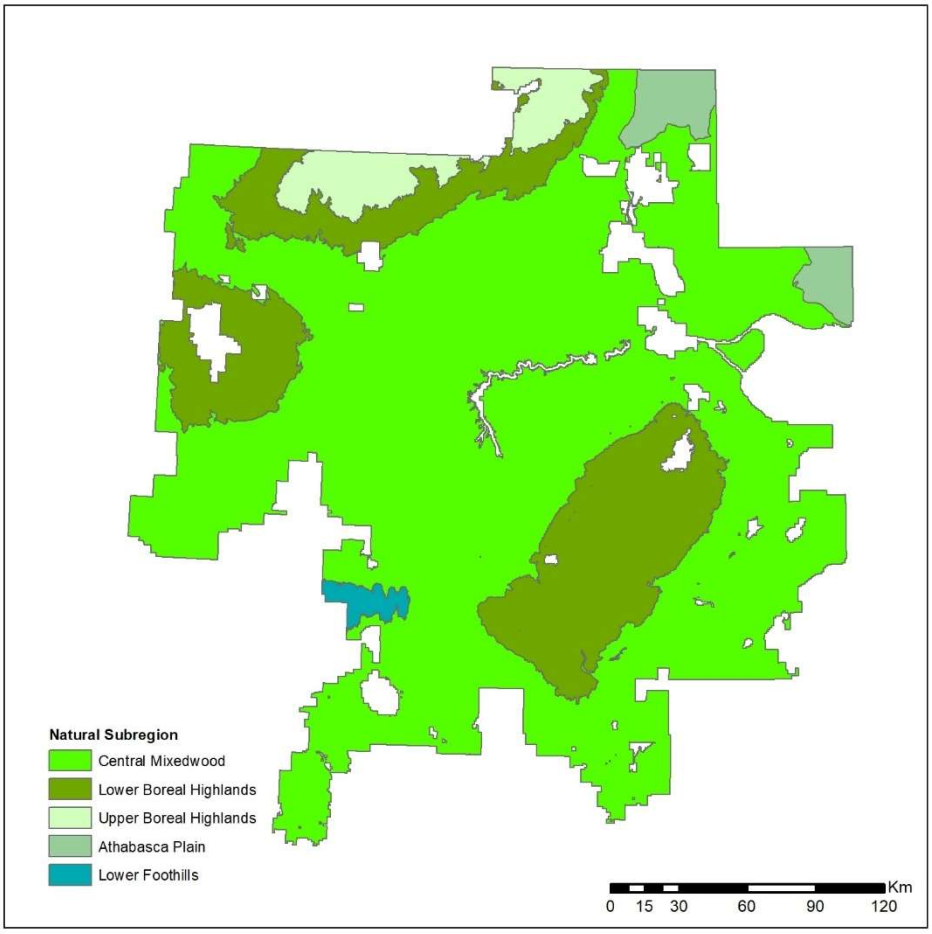

Figure 5. Natural sub regions on the Al-Pac FMA Area.

HCV Designation Decision:
Woodland Caribou is designated HCV because of its wide range and sensitivity to landscape characteristics. It can also be considered a featured species, because of the effort put on its management across the forest. It is also considered HCV in element 1 as a SAR. There were no other HCV designations[7] in this element. This was mainly because "focal" species involve the interaction of a species with other species; the food web and habitat interrelationships in the FMA area are widespread and robust so one species would not put other species in peril. There is no species which influences a broad area of forest cover, thereby affecting other species.

[7] This designation was reviewed January 2020 including a review of the web info and other sources.

5) Does the forest support concentrations of species at the edge of their natural ranges or outlier populations?

Rationale:

Relevant conservation issues include vulnerability to range contraction and potential loss of genetic adaptation at the edge of the geographic range.

Assessment Methodology:

- Range and population estimates from Al-Pac or local authorities and local experts for plant species
- Species identified as ecologically significant through consultation and engagement

Assessment Results:

As a northern forest, the FMA area is the northern limit for a number of species, and the southern limit for others. Some species at their range limit that may be candidate HCVs have been assessed in element 1 as either a SAR or as a rare species.

Tree species

Al-Pac based the assessment of tree species at the edge of their natural range on ecosites or forest types. Management of forest types is the direct responsibility of the forest managers and the forest inventory provides good information on tree distribution, abundance and management. A search of the inventory for unusual occurrences of edge of range species did not yield any occurrences.

HCV Designation Decision:

No HCVs were designated.

6) Does the forest lie within, adjacent to, or contain a conservation area:
a) designated by an international authority;
b) legally designated or proposed by relevant federal/provincial legislative body;
c) identified in regional land use plans or conservation plans.

Rationale:

This question ensures compliance with the conservation intent of a conservation area.

In Alberta, parks and conservation areas are legally removed from the license area. Parks and conservation areas are still considered HCVs, but the responsibility of the forest manager is limited to ensuring that the boundaries are protected and there are no indirect impacts or incursions into the park or conservation area.

Assessment Methodology:

- Alberta Land Use Framework
- Lower Athabasca Regional Plan (LARP)
- National Ecological Framework For Canada
- Canadian Heritage River System
- Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar) - Canada
- Canadian Protected and Conserved Areas Database (NASA supported GIS layers) – detailed and complex compilation of datasets.

Regional Land Use Plans
Land use planning can be an important contribution to protected areas if there is regulated protection afforded to ecological or cultural sites. Alberta has a Land Use Framework which divides the province into 7 regions. For the FMA, the north-east area is covered by the Lower Athabasca Regional Plan (LARP). The Lower Athabasca region in northeast Alberta is home to Alberta's vast oil sands resources. LARP is the first regional plan under Alberta's Land-use Framework. It is intended to guide resource decisions while considering environmental, social and economic impacts.

Several new protected areas – or expansions of existing protected areas - were recommended through the LARP process, and subsequently given legal protection through Alberta's *Provincial Parks Act;* these new or expanded parks are included along with other protected areas in Table 10. The one exception to this is the Gipsy Gordon Wildland Park, which is awaiting an Order in Council to legislate it as an official provincial park.

As part of that process, the Lakeland Area, which lies east and north of Edmonton and ranges into the FMA area, was reviewed for expansion as a conservation area, but was not given additional legal protection. The area is 11,000 ha in size and is characterized by diverse outdoor opportunities. The Lakeland Area is not a specific location; rather it is a region of Alberta. As such it is at a larger scale than normally considered an HCV for geographical values.

Environmentally Significant Areas
Environmentally Significant Areas (ESAs) in Alberta (2014 update) is intended for use by provincial and municipal land-use planners, industry, consultants and others to support municipal, regional, and provincial scale planning initiatives. ESAs contain rare or unique elements or include elements that may require special management consideration due to their conservation needs. They reflect biological diversity, soil, water, or other natural processes, at multiple spatial scales.

It is important to note that ESAs do not consider management and are not areas derived from natural resource policy. In short, they do not dictate specific management objectives, or comprehensive status reporting and monitoring. They do not represent government policy or confer legal protection. Although the ESA dataset served as an additional source of information for the HCV assessment, it was deemed not suitable for use in the designation of HCVs under FSC Principle 9.

IUCN Categories
Table 9 provides a description of types of conservation lands in the vicinity of the FMA area.

Conservation areas and any designations by Canadian or International organizations were examined for alignment with the International Union for the Conservation of Nature (IUCN) designation of protection, which is consistent with FSC requirements.

- **I a Strict Nature Reserve**: Category I a are strictly protected areas set aside to protect biodiversity and also possibly geological/ geomorphical features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values. Such protected areas can serve as indispensable reference areas for scientific research and monitoring

- **I b Wilderness Area**: Category I b protected areas are usually large unmodified or slightly modified areas, retaining their natural character and influence without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition.

- **II National Park**: Category II protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational, and visitor opportunities.

Assessment Results:
The certified area of the Al-Pac FMA area is 5.9 million ha. Adjacent to the FMA area are 24 designated protected areas (Table 10). As well, there are a large number of protected areas that are close but not directly adjacent to the FMA area. These are listed in Appendix 2. List of adjacent and non-adjacent protected areas near the Al-Pac FMA Note that a number of small Provincial Recreation Areas (PRAs) were not considered as meeting the IUCN definition of protected and were not included in the assessment of HCV. This decision follows guidance in Annex D regarding "purely recreational" areas; these PRAs include staging areas and small campgrounds.

International and National Designations
There are no Ramsar sites (internationally recognized wetlands) within the FMA area. However, the Peace-Athabasca Delta (Designated 24/05/82; Alberta; 321,300 ha; 58°42'N 111°08'W. World Heritage Site; National Park) lies just north of the FMA area. It is not impacted by operations in the FMA and is not considered an HCV within the geographical scope of this assessment.

The International Biological Program (IBP) was an effort between 1964 and 1974 to coordinate large-scale ecological and environmental studies. No sites are located in the vicinity of the FMA area.

National Designations
There are no federal protected areas in the immediate vicinity of the FMA area.

Provincial Designations
Alberta has a variety of classifications for special areas and permits different degrees of industrial and other activity within them. Table 9 below lists the types of Provincial protected areas found in the vicinity of the Al-Pac FMA area.

Of the regulated designations, Provincial Parks and Wildland Provincial Parks have the most restrictions. International Union for the Conservation of Nature (IUCN) would regard Provincial Parks as Category I and Wildland Provincial Parks as Category II. These do not allow logging and as such meet the conventional usage of the term "protected". There would be some exceptions, and in some cases, multiple designations (I and II) occur within one area. These meet the level of significance consistent with HCVs and as such are designated HCVs. Note the protected areas are not part of the forest licence, but the managers bear responsibility for safeguarding against impacts and incursions within the boundaries. For completeness, Appendix 2 provides a listing of protected areas which are not directly adjacent to the FMA area but that are nearby - Appendix 2. List of adjacent and non-adjacent protected areas near the Al-Pac FMA

Table 9. Types of Conservation Lands in Alberta.

Park Class defined by Provincial Government	Objective	Provincial Legislation	Activities	Area (ha)	#
Provincial Parks	To preserve natural heritage of provincial significance or higher, while supporting outdoor recreation, heritage tourism and natural heritage appreciation activities that depend upon and are compatible with environmental protection	Legislation: Provincial Parks Act	Natural environment with diversity of compatible, facilitated recreation	246,797.89	76
Wildland Provincial Parks	To preserve and protect natural heritage and provide opportunities for compatible backcountry recreation	Legislation: Provincial Parks Act	Remote, wilderness Hunting, motorized access may be permitted	3,333,386.29	34
Provincial Recreation Areas	To support compatible outdoor recreation and tourism, often providing access to lakes, rivers, reservoirs and adjacent crown land	Legislation: Provincial Parks Act	Diversity of front country recreation	88,588.63	203
Wilderness Areas	To preserve and protect natural heritage, where visitors can experience solitude and non-consumptive, nature-based wilderness opportunities	Legislation: Wilderness Areas, Ecological Reserves, Natural Areas and Heritage Rangelands Act	Remote wilderness, foot access only	100,988.79	3
Ecological Reserves	To preserve and protect natural heritage in an undisturbed state for scientific research or education	Legislation: Wilderness Areas, Ecological Reserves, Natural Areas and Heritage Rangelands Act	Foot access only	26,843.34	15
Natural Areas	To preserve and protect sites of local significance and provide opportunities for low-impact nature based recreation and nature appreciation activities	Legislation: Wilderness Areas, Ecological Reserves, Natural Areas and Heritage Rangelands Act	Self facilitated	129,228.98	138

Table 10. Parks, Conservation Reserves within the vicinity of the Al-Pac FMA area.

Name	Type	URL	IUCN Cat.	Area (ha)	LAT	LONG
Birch Mountains Wildland Provincial Park	Wildland Provincial Park	https://www.albertaparks.ca/parks/northeast/birch-mountains-wpp/	Ib	146,150	57.509	-112.954
Birch River Wildland Provincial Park	Wildland Provincial Park	https://www.albertaparks.ca/parks/northeast/birch-river-wpp/	Ib	332,290	57.864	-113.433
Calling Lake Provincial Park	Provincial Park	https://www.albertaparks.ca/parks/northeast/calling-lake-pp/	II	740	55.177	-113.275
Cross Lake Provincial Park	Provincial Park	https://www.albertaparks.ca/parks/northeast/cross-lake-pp/	II	2,050	54.654	-113.797
Crow Lake Ecological Reserve	Ecological Reserve	https://www.albertaparks.ca/parks/northeast/crow-lake-er/	Ia	980	55.789	-112.135
Crow Lake Provincial Park*	Provincial Park	https://www.albertaparks.ca/parks/northeast/crow-lake-pp/	Ia	790	55.800	-112.152
Crow Lake Provincial Pk Expansion*	Provincial Park (Prop)	n/a	N/A	410	55.807	-112.126
Dillon River Wildland Provincial Park	Wildland Provincial Park	https://www.albertaparks.ca/parks/northeast/dillon-river-wpp/	Ib	191,430	55.793	-110.194
Gipsy Lake Wildland Provincial Park	Wildland Provincial Park	https://www.albertaparks.ca/parks/northeast/gipsy-lake-wpp/	Ib	35,820	56.495	-110.388
Gipsy-Gordon Wildland Provincial Park	Wildland Provincial Park (Prop)	n/a	Ia	158,480	56.543	-110.397
Grand Rapids Wildland Provincial Park	Wildland Provincial Park	https://www.albertaparks.ca/parks/northeast/grand-rapids-wpp/	Ib	26,350	56.484	-112.339
Gregoire Lake Provincial Park	Provincial Park	https://www.albertaparks.ca/parks/northeast/gregoire-lake-pp/	II	700	56.485	-111.185
Gregoire Lake Provincial Park Expansion	Provincial Park (Proposed)	n/a	N/A	3,720	56.462	-111.129
Kitaskino Nuwenëné Wildland	Wildland Provincial Park	https://www.albertaparks.ca/parks/northeast/kitaskino-nuwen%C3%ABn%C3%A9-wpp/	Ib	314,510	57.922	-111.638
La Biche River Provincial Recreation Area	Provincial Recreation Area	https://www.albertaparks.ca/parks/north/la-biche-river-pra/information-facilities/	II	65	55.0278	-112.5153
La Biche River Wildland Provincial Park	Wildland Provincial Park	https://www.albertaparks.ca/parks/northeast/la-biche-river-wpp/	Ib	17,330	54.988	-112.625
La Saline Natural Area	Natural Area	https://www.albertaparks.ca/parks/northeast/la-saline-na/	III	410	57.081	-111.523

Name	Type	URL	IUCN Cat.	Area (ha)	LAT	LONG
Lakeland Provincial Park	Provincial Park	https://www.albertaparks.ca/parks/northeast/lakeland-pp/	II	14,770	54.759	-111.557
Lakeland Provincial Recreation Area	Provincial Recreation Area	https://www.albertaparks.ca/parks/northeast/lakeland-pra/	II	44,760	54.721	-111.399
Otter-Orloff Lakes Wildland Provincial Park	Wildland Provincial Park	https://www.albertaparks.ca/parks/northeast/otter-orloff-lakes-wpp/	II	6,980	55.370	-113.547
Sir Winston Churchill Provincial Park	Provincial Park	https://www.albertaparks.ca/parks/northeast/sir-winston-churchill-pp/	II	660	54.849	-111.976
Stony Mountain Wildland Provincial Park	Wildland Provincial Park	https://www.albertaparks.ca/parks/northeast/stony-mountain-wpp/	Ib	13,950	56.215	-111.244
Whitemud Falls Ecological Reserve	Ecological Reserve	https://www.albertaparks.ca/parks/northeast/whitemud-falls-er/	Ia	880	56.697	-110.087
Whitemud Falls Wildland Provincial Park	Wildland Provincial Park	https://www.albertaparks.ca/parks/northeast/whitemud-falls-wpp/	Ia	3,830	56.705	-110.085
Clearwater River Provincial Park	Wilderness Park	https://www.tourismsaskatchewan.com/provincialpark/1419/clearwater-river-provincial-park	Ib	236,140	56.929	-109.045

*Crow Lake Provincial Park was slated for “full closure” in the Government of Alberta’s 2020 “Optimizing Alberta’s Parks”. It is unclear if the park’s protected designation will be removed.

Provincially Significant Wetlands
There are no wetlands in the FMA area which have been protected through provincial regulation because of their provincial or regional importance. Wetlands are assessed in more detail for their provincial status as HCVs in element 13 - Ecosystem Services.

HCV Designation Decision:
The following designated protected areas are HCVs within the vicinity of the Al-Pac FMA area:

- Provincial Parks
- Wildland Provincial Parks
- Provincial Recreation Areas
- Wilderness Areas
- Ecological Reserves
- Natural Areas

Category 2) Forest areas containing globally, regionally, or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.

7) Does the forest constitute or form part of a globally, nationally or regionally significant forest landscape that includes populations of most native species?

Rationale:
Under this question, the forest must not only be large enough to support most or all native species, but it should be large enough that long-term, large-scale natural disturbances can occur to maintain the full range of ecosystem processes and functions (i.e., naturally functioning landscapes).

Assessment Methodology:

- Global Forest Watch Intact Forest Landscapes

In the region encompassing the FMA, fire, blowdown, and insect outbreaks are the principal natural disturbances. Forest fires are suppressed and although some fires continue to occur, their frequency and size class distribution are different than the pre-settlement distribution of fires. Consistent with the definition above, large scale insect and blowdown occurrences are not controlled and forest harvesting is planned and conducted to approximate forest fires and other disturbances to the extent possible. Al-Pac's natural disturbance-based model of forestry draws from extensive research on ecosystem-based management and historical disturbance regimes (e.g. Andison 2015). Additionally, Al-Pac continues to invest in research into ecosystem-based management through long-term involvement in the Foothills Research Institute's Healthy Landscapes Program, and the Ecosystem-Based Management Chair at the University of Alberta. Effectiveness monitoring to evaluate how this forest management model supports biodiversity is conducted by the Alberta Biodiversity Monitoring Institute, through dedicated site-level studies (Huggard et al. 2015; ABMI 2023) and a long-term monitoring program that reports on the Al-Pac FMA area every 5 years. The vigorous discussion about Intact Forest Landscape (IFL) that is occurring within FSC Canada and FSC International is centred on maintaining large fully functioning ecosystems, and how forestry modelled on wildfire aligns with the natural disturbance regime of the fire-prone boreal forest. Until this is resolved, IFLs assessed by Global Forest Watch

(GFW) are used here. Al-Pac monitors the discussion around IFL requirements at the national and international level on an ongoing basis.

Assessment Results:

Figure 5 presents an overview of IFLs within the vicinity of the FMA area from Global Forest Watch Canada which uses their own criteria, including:

- "a contiguous mosaic of natural ecosystems in the forest landscape, essentially undisturbed by human influence"
- > 50,000 hectares in size.

Despite the large area within the FMA, the long history of exploration for energy reserves in this globally prominent oil producing landscape, has resulted in a significant human disturbance footprint. Thus, applying the GFW interpretation of intactness, "undisturbed by human influence", results in the identification of a relatively small area of IFL which is already deemed a protected area through the 2012 Lower Athabasca Regional Plan but awaiting formal designation from the provincial government (Gipsy Gordon Wildland Provincial Park).

HCV Designation Decision:

The long history of energy exploration has left widespread anthropogenic disturbance on and around the FMA area. The one area of undisturbed potential IFL is already identified for protection (Gipsy Gordon Wildland Provincial Park) and has been designated HCV under element 6. There were no new HCVs designated under this element.

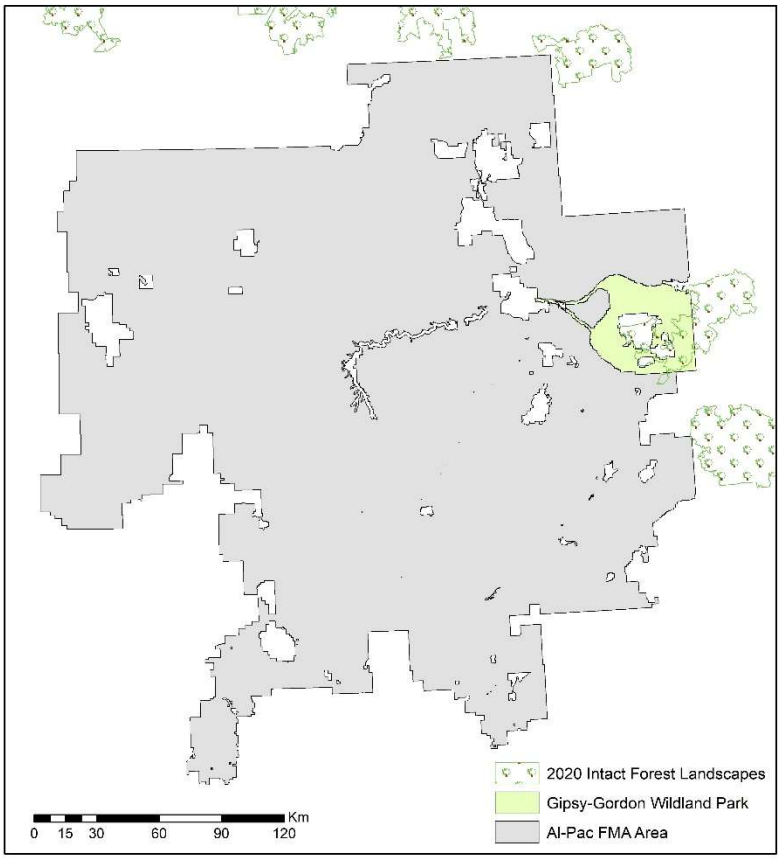

Figure 6. Global Forest Watch IFL in the Al-Pac FMA area.

Category 3) Forest areas that are in or contain rare, threatened or endangered ecosystems.

8) Does the forest contain naturally rare ecosystem types?

Rationale:

Rare forest types may contain unique species and communities that are adapted only to the conditions found there. For this reason, they may qualify as “concentrations of biodiversity values”.

Assessment Methodology:

- NatureServe
- World Database of Key Biodiversity Areas
- Canada Key Biodiversity Areas
- Alberta Conservation Information Management System
- Conservation International
- Ducks Unlimited Canada
- Information pertaining the Canadian Boreal Forest Agreement
- Al-Pac search of rare forest types in Alberta Vegetation Inventory

Assessment Results:

Conservation International has not identified any biodiversity hotspots within Canada.

Canada Key Biodiversity Areas have been identified through the KBA Canada Coalition comprising governments and non-governmental organizations. Two KBAs were identified in northeast Alberta: the Peace-Athabasca Delta and the Richardson Sands site. Both KBAs are outside the FMA area and are located within protected areas (Wood Buffalo National Park and the Richardson Wildland Provincial Park, respectively).

NatureServe Canada and the United States National Vegetation Classification (USNVC) have databases that categorize the boreal forest by ecological context. The USNVC database is linked with NatureServe and provides information about the forest category as well as the international conservation status of the forest type, but does not provide information on rarity or risk. The forest types within the Al-Pac FMA area are listed as the North American Northern Boreal Woodland Macrogroup.

These USNVC classifications are the dominant and widespread lowlands typical of the area. They were not designated as HCV.

Alberta Conservation Information Management System (ACIMS)

A review of the ACIMS database turned up one 'rare ecosystem type' meeting the G1-3 criterion within the Central Mixedwood natural sub-region that comprises most of the FMA area (Samphire Emergent Marsh). However, the exact location was not provided, and its presence has not been confirmed on the FMA area. As a rare type of alkali salt marsh, it qualifies as an interesting and unusual feature that would be regionally significant. It is tentatively listed as possible HCV pending identification of a more specific location. No ecosystems met these criteria in the other natural subregions within the FMA area (Athabasca Plain, Lower Foothills, Lower Boreal Highlands, and Upper Boreal Highlands).

Wetland Inventory

Wetlands on the Al-Pac FMA area are well documented as a result of a long partnership between DUC, the Alberta Government and resource companies such as Al-Pac.

Some wetland classes are rare across this landscape, although most types are abundant (Figure 7). Aquatic Beds, Graminoid Poor Fens, Emergent Marshes, Meadow Marshes, Mudflats, and Open Bogs all represent <1% of the wetlands present in the FMA area, and are designated HCV based on their rarity.

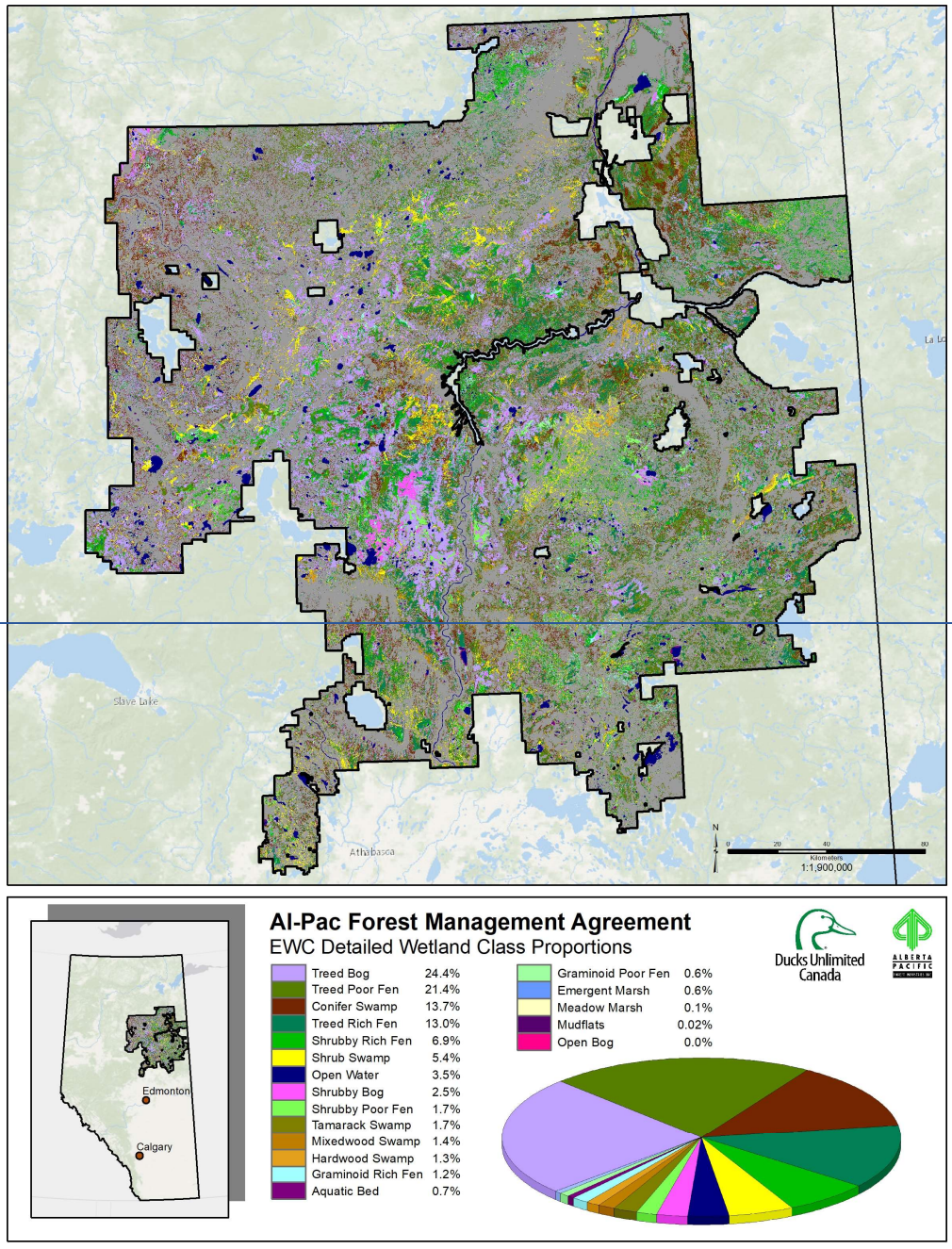

Figure 7. Detailed wetland classes present in the Al-Pac FMA area.

Rare forest types from Inventory

Al-Pac staff reviewed the forest inventory for unusual occurrences of species that may indicate a rare forest type, but no unusual species occurrences were identified.

This assessment included potential old growth forests within each of the forest types. As a fire-dominated system, very old forest occurrences in the boreal are rare and could qualify as regionally significant, especially for some less common forest types. The review of the inventory showed lots of old forest throughout the FMA area. Examination of the less common units did not indicate any particularly rare occurrences of old forest in a rare forest type. No old forest stands were designated specifically for their old forest characteristics. Very old forest is rare within the FMA area and a precautionary approach is used to maintain a range of old forest throughout the FMA area. This provides a reasonable opportunity for some portion of forest to reach a very old age by escaping fire for long periods of time.

Table 11. Seral Stage Definitions (Source FMP - D. Andison)

Strata	Juvenile (y)	Immature (y)	Mature (y)	Over-mature (y)
Deciduous	1-10	11-60	61-80	>80
Pine	1-20	21-60	61-80	>80
Black Spruce	1-20	21-70	71-120	>120
Mixed & white Spruce	1-10	11-60	61-100	>100

HCV Designation Decision:
Rare wetland types have been designated HCV[8]. The Samphire Emergent Marsh rare ecosystem is considered as a possible HCV pending specific location details.

9) Are there ecosystem types within the forest or ecoregion that have significantly declined?

Rationale:

Ecosystem vulnerability is the key issue under this question. This indicator includes rare forest ecosystem types that may now be rare within the area due to historic harvest practices (e.g. late seral stage red and white pine in eastern Canada). Grassland and wetland ecosystems would also be included as HCVs if they meet the test of regional significance.

Assessment Methodology:

- NatureServe
- Terrestrial Ecoregions of North America: A Conservation Assessment
- Conservation International
- Al-Pac Annual Allowable Cut (AAC) determination documentation

Assessment Results:
Grasslands and Wetlands
HCVs internationally now include wetlands and grassland areas as described by HCV Resource Network. Many of the boreal wetland types are treed ecosystem types but most of these are not of commercial interest within the FMA area. In the context of this element, grasslands and wetlands ecosystem decline would be candidate HCVs. Although the FMA area has a considerable amount of resource development, land conversion is mainly limited to the mineable oil sands area which has been excised from the FSC certificate, as it is beyond the influence of Al-Pac. Additionally, human population growth has been moderate over most of the forest.

In this assessment, there were no non-forest areas designated HCV.

[8] This designation was reviewed in November 2019, including a review of the web info and other sources.

Forests -- Old Forest
As part of the determination of the AAC, managers prepare a series of maps to assess forest characteristics. One of the maps produced for each forest management unit (FMU) is the amount and distribution of "mature/ old interior core", projected over three time periods (See Volume 2 Appendices of the 2015 FMP for each FMU). The projection is based on six criteria:

- >60m from non forest
- 30 m from non-interior edge
- >30% crown closure
- 2m stand height
- Older than established seral stage
- 100 ha in size

This information was used to assess whether there has been a decline in the occurrence of mature/old forest types. The maps were reviewed and there were no significant areas of old forest identified as having declined, or as being projected to decline.

No declining "old growth" forest types were identified as suitable for designation as HCV.

HCV Designation Decision
No ecosystems have been designated HCV[9] because of a decline.

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10) Are large landscape level forests (i.e. large unfragmented forests) rare or absent in the forest or ecoregion?

Rationale:

In regions where large functioning landscape level forests are rare or do not exist (highly fragmented forest), remnant forest patches may require consideration as potential HCVs (i.e. best of the rest). The question identifies remnant forest patches or blocks over 5,000 ha in size.

Assessment Methodology:

- Global Forest Watch Intact Forest Landscapes

Assessment Results:

Some areas of unfragmented forest occur in portions of the Al-Pac FMA area. These are not extensive due the long history of resource exploration, especially for energy, in the area. The GFW map of Intact Forest Landscapes (Figure 6. Global Forest Watch IFL in the Al-Pac FMA area) provides a snapshot of the amount of large unfragmented forests in the Al-Pac FMA area.

At the time of writing, the guidance on the delineation of Intact Forest Landscapes was still under development by FSC. As such, this assessment will be reviewed in the near future when there is more clarity around the requirements of the standard.

HCV Designation Decision:
No large landscape level forest fragments were designated as HCV[10].

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[9] This designation was reviewed in November 2019, including a review of the web info and other sources.

[10] This designation was reviewed in November 2019, This assessment will be reviewed in the near future when there is more clarity around the requirements of IFL in the FSC standard.

11) Are there nationally/regionally significant diverse or unique forest ecosystems?

Rationale:

Vulnerability; species diversity; significant ecological processes.

Assessment Methodology:

- Environmentally Sensitive Areas - Government of Alberta
- NatureServe communities
- Conservation Assessment (protected areas "gap analysis") & Marxan Analysis

Assessment Results:

This element looks for "uniqueness". The large landscape scale conifer dominated ecosystems are typical of the area and are assessed in the previous element (LLLF). The discussion here, in element 11, focuses on smaller, more unusual ecosystem types that were assessed through discussions with the local management staff, and searched using the websites mentioned above.

Environmentally Significant Areas (ESA)

The Alberta ESA dataset provides a useful parallel assessment of values that is a good means of verifying this HCV assessment. The ESA assessment uses four criteria that mirror the HCV assessment process. The criteria include the following:

1. Areas that contain focal species, species groups or their habitats
2. Areas that contain rare, unique or focal habitat
3. Areas with ecological integrity
4. Areas that contribute to water quality and quantity

The Alberta ESA process defines these as "vital to the long-term maintenance of biological diversity, physical landscape features and/or other natural processes at multiple spatial scales". The areas are based on scientifically rigorous, defendable, and relevant methodology and can be used to integrate ecological values into provincial planning and management. As the program intends, this information was used for early decision support for identification of important areas as possible HCV.

Nature Serve

As reviewed in element 8, on naturally rare ecosystems, NatureServe Canada and the United States National Vegetation Classification (USNVC) databases (which covers Canada as well) were also reviewed under Element 11. The databases were examined but did not identify any additional unique ecosystem types for consideration as HCV.

HCV Designation Decision:

No special unique ecosystems were designated HCV[11] in this review.

Category 4) Forest areas that provide basic services of nature in critical situations (e.g. watershed protection, erosion control).

12) Does the forest provide a significant source of drinking water?

Rationale

[11] This designation was reviewed in January 2020, including a review of the web info and other sources.

The potential impact to human communities is so significant as to be 'catastrophic' leading to significant loss of productivity, or sickness and death, and there are no alternative sources of drinking water.

Assessment Methodology

- Lower Athabasca Region Surface Water Quantity Management Framework for the Lower Athabasca River
- Known usage of water by local communities
- Base maps showing topography, local terrain mapping

Assessment Results:
Source Water Protection
The primary concern from a forestry perspective would be impacts of forestry on surface water sources. This is reflected in the FMP through Operating Ground Rules developed for the protection of water.

The source water protection plan for this part of Alberta is the Lower Athabasca Region Surface Water Quantity Management Framework for the Lower Athabasca River. Normally, primary threats to drinking water include infrastructure related to sewage and septic beds, agricultural waste and others. In this case, the plan addresses the allocation of water for resource production.

To date, no concerns have come forward from communities related to forestry impacts on drinking water sources through consultation and engagement processes.

No drinking water risk situations resulting from forestry activities were identified in the Lower Athabasca Region Surface Water report for any Indigenous or non-Indigenous communities in any of the watersheds within the forest.

HCV Designation Decision:
No HCV[12] was identified.

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13) Are there forests that provide a significant ecological service in mediating flooding and/or drought, controlling stream flow regulation, and water quality?

Rationale:

Forest areas play a critical role in maintaining water quantity and quality, and a service breakdown could have catastrophic impacts.

In this element there is also a discussion of carbon storage and sequestration. It is here because the primary location of carbon in the north is in peatlands. Changes in hydrology pose risks to this carbon reservoir.

Assessment Methodology:

- North American Waterfowl Management Plan – Canada
- Alberta North American Waterfowl Management Plan

Assessment Results:

[12] This designation was reviewed in Oct 2019, including a review of the web info and source protection plan.

Management of water in Alberta is a responsibility that is shared among a number of agencies and companies, and is governed under acts such as Alberta's Water Act, Public Lands Act, and the Environmental Protection and Enhancement Act, as well as the Federal Environmental Protect Act and the Fisheries Act. This legislation has little bearing on forestry in the FMA (although it could have been historically important) and so the legislation was not considered as sources for HCVs.

Ducks Unlimited Canada (DUC) has created a useful series of technical manuals to assist in wetland management, which cover topics such as reducing risks from incidental take. The References and Literature section of this report provides a listing of the DUC technical literature and presentations that are available.

Water-associated Environmentally Significant Areas (ESAs)
As assessed in the previous version of the HCV report, Al-Pac's preferred strategy for water-associated ESAs is to avoid activities in or near wet areas. There was no indication that areas near water are of special significance in the region, as they are common. Where activities are necessary close to water, Al-Pac's planning and operational practices, as outlined in the Operating Ground Rules are applied to minimize adverse effects and maintain healthy aquatic ecosystems. This was not an HCV. Further, Al-Pac is involved in the Forest Management and Wetland Stewardship Initiative, an initiative between forestry companies and Ducks Unlimited Canada to advance wetland stewardship in the boreal forest through sustainable forest management.

Hydrology Impacts
A paired, pre- and post-harvest experiment in aspen stands was conducted within the FMA area to investigate the effects of forest harvest on surface runoff and groundwater (Donnelly et al., 2016). Although timber harvest reduced transpiration and interception by trees, the excess water did not result in lateral surface runoff. Rather, this water was absorbed by the soil leading to groundwater recharge, such that the study found no difference in flow pre- and post-harvest. The study concluded that climate and beaver activity are the primary drivers determining runoff in this region. These studies indicate that surface runoff from forestry is low.

Carbon and Peatlands
The hydrological functioning of peat ecosystems is a key concern for sustainable forest management in Northeastern Alberta. Roads built across peatlands may impede or redirect water flow, resulting in flooding and drying on the upstream and downstream sides of the road, respectively. This may result in tree death in the flooded side, and increased tree growth due to deeper rooting in the drier side, with implications for the process of soil carbon sequestration and storage as well as fuel loading for wildfire (Miller et al. 2015).

Research conducted in the FMA area (Thompson et al 2017) suggests that the risk is highest in peatlands and graminoid shrubby fens with finely textured, clay-like soils, where the roadbed forms an impermeable barrier to water movement. The risk of flooding/drying may be mitigated if peatlands with deep, finely textured soils are avoided. If such peatlands cannot be avoided, then mitigation methods to promote water movement such as culverts should be implemented. The Forest Management and Wetland Stewardship Initiative provides guidance on this issue.

Peat is widely distributed in boreal ecosystems while carbon distribution varies with wetland class (Table 12). Carbon provides an ecological service in terms of carbon sequestration. Important peat carbon sinks are protected by the Operating Ground Rules, which provides guidance on protecting sensitive soils during road building activity. Ducks Unlimited Canada's (2018) Wetland Best Management Practices for Forest Management Planning and Operations and the FP Innovations (2016) guides provide best practices for operational mitigation.

Table 12. Carbon deposition estimates by ecosystem Ducks Unlimited.

EWC Carbon Project - Detailed Class Total Carbon

Detailed Class	# of Sites	Organic Soil Depth (cm) All data sources	Organic Carbon Density (g/cm^3) Zoltai Data Only	Total Carbon (Tonnes/ha)
Open Water / Mudflats	0			289*
Aquatic Bed	3	73.67		289*
Emergent Marsh	9	41.33		289*
Meadow Marsh	38	122.53		289*
Hardwood Swamp	20	40.70		289*
Mixedwood Swamp	23	56.26		289*
Tamarack Swamp	26	55.12		289*
Shrub Swamp	108	75.56	0.057	429
Conifer Swamp	325	96.76	0.062	599
Open Bog	5	182.60	0.043	789
Treed Poor Fen	323	173.08	0.058	996
Treed Rich Fen	173	157.94	0.063	1001
Shrubby Rich Fen	78	208.03	0.053	1104
Graminoid Poor Fen	16	216.81	0.053	1147
Shrubby Bog	26	233.65	0.051	1199
Graminoid Rich Fen	98	241.06	0.052	1242
Shrubby Poor Fen	40	237.05	0.053	1248
Treed Bog	152	253.49	0.054	1367

HCV Designation Decision:

Wetlands are widespread in Northeastern Alberta and drive boreal ecosystem dynamics. Forestry operations are designed to protect all waterways in the forest as outlined in the FMP and other operational best practices. Because climate and beaver activity are the main drivers of runoff, no forest or wetland types are designated as HCVs in this element.

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14) Are there forests critical to erosion control?

Rationale:

This question seeks to identify forests that contribute to the stability of soil, terrain or snow, including control of erosion, sedimentation, landslides, or avalanches.

Assessment Methodology:

- Review of Alberta base maps showing topography
- Review of local terrain mapping by Al-Pac planning team

Assessment Results:

There are no forests critical to erosion control that are of a significant size that are necessary to prevent endangerment to communities.

Operations that occur along shorelines and in riparian zones create higher risk for erosion and other negative impacts on water. During the planning stage for operations adjacent to water bodies, the planning team assesses all lakes, rivers and streams for potential impacts related to shoreline activities. Highly sloped areas are also considered higher risk for erosion. An inventory of sloped harvest areas is maintained internally by Al-Pac's operations team in the "Disturbance Monitoring List", and these sites are monitored on an ongoing basis.

HCV Designation Decision:
There is no evidence of areas at high-risk for compromised soil stability, sedimentation or erosion through forest operations on the forest; no HCVs[13] were designated.

15) Are there forests that provide a critical barrier to destructive fire (in areas where fire is not a common natural agent of disturbance)?

Rationale:

Are there forest areas where there is a high risk of uncontrolled, destructive fire and in which forest areas or forest types can act as a barrier to the spread of fires?

Do these forest areas contain or are they adjacent to human settlements or communities that would be at risk from uncontrolled, destructive forest fire?

Managers should accept HCV designations for forests adjacent to communities and manage using the precautionary principle in consideration of the safety of the inhabitants. How this is defined should be determined locally.

Assessment Methodology:

In the past, this element has not been considered an HCV in Canada. Recent fires in the boreal forest have affected communities significantly, including communities in the vicinity of the FMA area. In most areas, fire management strategies near communities will be considered as a priority should local municipalities decide they are needed. Al-Pac reviewed the local approach to this significant climate change impact.

Assessment Results:

In the FMA area, these areas are called FireSmart Community Zones and follow provincial guidelines. Most communities in the Forest Protection Areas are surrounded by an approximate 10km area where full debris disposal is required according to the debris management standards for timber harvest operations.

Industries operating in the FireSmart Community Zone can access maps on Service Alberta that display the most current requirements of the Wildfire Alberta program.

Implementation of a special fuel management zone adjacent to communities could be somewhat detrimental to other forestry objectives. However, given the dramatic consequences of fire in the wildland-urban interface, priority would be given to fire management and it is considered an HCV.

HCV Designation Decision
FireSmart Community Zones[14] are designated HCV.

16) Are there forest landscapes (or regional landscapes) that have a critical impact on agriculture or fisheries?

Rationale:

Wind and microclimates at the ecoregional scale can affect agriculture and/or fisheries production. Riparian forests play a critical role in maintaining fisheries by providing bank stability, sediment control, nutrient inputs and microhabitats. More local effects of forest areas (e.g. adjacency of forests to agriculture

[13] This designation was reviewed in January 2020, including a review of the web info and other sources.

[14] This designation was reviewed in January 2020, including a review of the web info and other sources.

and fisheries production) may be more relevant in the HCV component regarding meeting basic needs of local communities.

Assessment Methodology:

- Municipal socio economic profiles

This element looks at the ecological services provided by forest ecosystems. Forests can influence fisheries and agricultural production in some areas within Canada and mismanaged forests can have a detrimental effect on farms and fisheries through destabilizing soils, sedimentation etc. Forest landscapes in Canada don't tend to have a critical impact on fisheries or agriculture as farms and forests tend not to be in close proximity to each other.

Assessment Results:

Fisheries

Recreational and subsistence fishing are important to local communities but there are few businesses based on this fishery within the FMA area. The most prominent fish species is Walleye (*Sander vitreus*), which is important commercially in other parts of the boreal forest. It is found in cool water lakes and rivers throughout the forest and is generally regarded as the most popular game fish species. Generally, fish habitat is protected by the Operating Ground Rules. Fish habitat is also protected at the site-specific scale through the individual assessments of proposed water crossings.

Conservation of spawning sites for this species is addressed in the Operating Ground Rules. As a widely distributed species, it was not designated HCV.

Agriculture and Non-Timber Forest Products

Agriculture does not comprise a significant part of the regional economy or land base within and around the FMA area. There is little commercial or subsistence activity based on biological production due to the cold climate and limiting soils in the area. Private lands outside of the FMA area are agricultural but do not come into conflict with forestry operations.

Commercial non-timber harvest is not significant in the FMA area. There are no commercial wild rice harvesting areas on the FMA area, and it was not designated as HCV. Note that personal use of non-timber forest products is described in element 18, which addresses whether the traditional cultural identity of the local community is particularly tied to a specific forest area.

Berry Picking

In the past, berry picking within the FMA area was done by some companies on a commercial scale. Currently there are no active commercial operations, although personal use is still important in the area. It was not designated as a commercial HCV under this element. Note that personal and cultural use is described in element 18.

***HCV Designation Decision**:*

There were no HCV designations as commercial values under this element[15].

[15] This designation was reviewed in Nov 2019 including a review of the web info and other sources.

Category 5) Forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health).

17) Are there local communities? (This should include both people living inside the forest area and those living adjacent to it as well as any group which regularly visits the forest).

Rationale:

This attribute looks at level of dependence of local communities on the forest to meet their basic needs and livelihoods. The framework asks:

- Is anyone within the community **making use of the forest**? (Look at members or subgroups rather than treating the community as homogenous)
- Is the use for their basic needs/ **livelihoods**? (Consider food, medicine, fodder, fuel, building and craft materials, water, and **income**)
- If it is not possible to say that it is NOT fundamentally important, then assume that it is.

Assessment Methodology:

Note this element deals primarily with livelihoods; including subsistence activities. In response to this direction, the following element includes a report on significant industrial activities including forestry.

- Discussions and correspondence with non-Indigenous communities and stakeholders during forest management planning engagement process; also with the Al-Pac Landscape Advisory Group
- Review of First Nation Profiles and Métis Settlement at Crown - Indigenous Relations and Northern Affairs Canada
- Review of Municipal Statistics Canada information
- Discussions and correspondence with Indigenous communities during forest management planning consultation sessions – Al-Pac

Assessment Results:

This attribute looks at the level of dependence of local communities on the forest to meet their basic needs. This includes a brief review of livelihoods in the area, which includes a wide range of sources of income including tourism, forestry, aggregates etc. First is a list of the communities in the forest.

Table 13. Indigenous communities within or with traditional lands within the Al-Pac FMA area.

Indigenous Community	Description
Buffalo Lake Métis Settlement	Métis settlements in Alberta have recently been engaged in discussion about their future role in forestry In Alberta with the Government of Alberta.
East Prairie Métis Settlement	
Elizabeth Métis Settlement	
Gift Lake Métis Settlement	
Kikino Métis Settlement	
Peavine Métis Settlement	
Fort McKay Metis Nation	
Bigstone Cree Nation	These six communities are within the boundaries of the FMA area
Chipewyan Prairie First Nation	
Fort McKay First Nation	
Heart Lake First Nation	
Fort McMurray First Nation No. 468	
Peerless Trout First Nation No. 478	
Cold Lake First Nation	These communities are outside the perimeter of the FMA area but have traditional lands within its boundaries.
Athabasca Chipewyan First Nation	
Beaver Lake Cree Nation	
Mikisew Cree First Nation	
Saddle Lake First Nation	
Whitefish Lake First Nation	
Whitefish (Goodfish) Lake First Nation 128	
Swan River First Nation	
Kehewin Cree Nation	
Loon River First Nation	
Sucker Creek First Nation	

Table 14. Municipalities* in the area of the FMA.

Municipality	Population	Link to stats
Regional Municipality of Wood Buffalo (Fort McMurray, Anzac, Fort McKay, Conklin, Gregoire Lake Estates)	71,000	Link
Lac La Biche County	8,330	Link
Municipal District of Lesser Slave River	2,803	Link
Town of Athabasca	1,250	Link
Athabasca County (Breynat, Wandering River)	7,869	Link
Municipal District of Opportunity (Wabasca-Desmarais, Calling Lake, Sandy Lake, Red Earth Creek)	3,181	Link
Village of Boyle		

* Incorporated - Not settlements or hamlets.

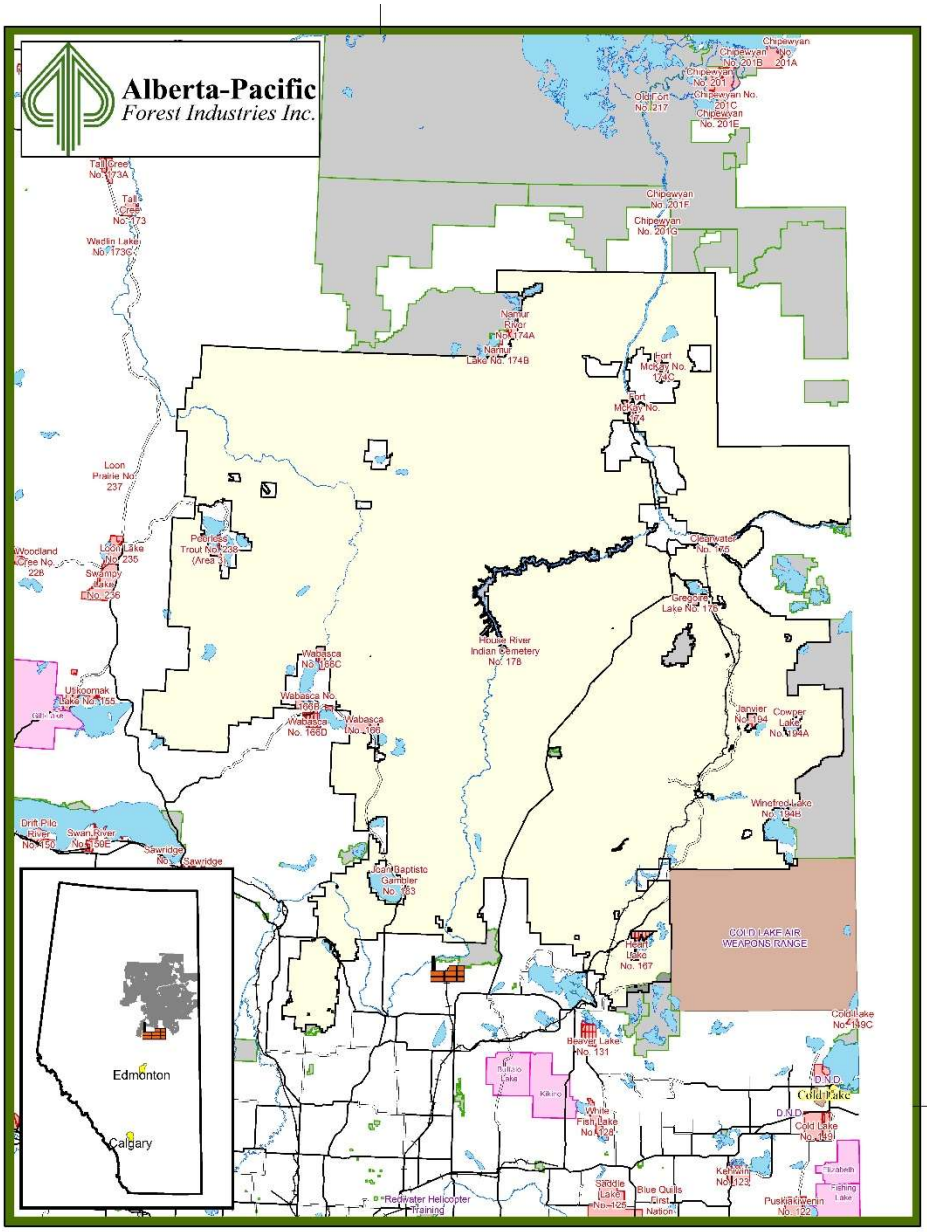

Figure 8. Indigenous communities within Al-Pac FMA area.

Subsistence/Health
Special prescriptions are used during the forest management planning process to protect values that are identified via engagement with local communities.

Large Industrial Activities – Energy and Forest Products
The energy sector provides 134,000 jobs in Alberta, many of which are in the vicinity of the FMA area and constitutes the largest proportion of the overall economic activity in the FMA area. It is supported by small and medium-sized retail businesses, large-sized business, industry supply services, and the education and healthcare sectors.

The economic contribution of wood processing is small compared with energy but it remains the cornerstone of the local economy and provides stable employment in some of the small communities.

Both wood processing and energy are functionally HCVs by virtue of the livelihoods they create. The energy sector is a major contributor of livelihoods to communities in this part of Alberta and is of national significance. As well, the forest industry is critical to the economy of the region. There is no doubt that forest and resource development is a source of livelihoods, as the element requires – both are critical to the communities inside the forest and to many outside of it.

In practical terms, the Forest Management Plan outlines the management and monitoring for the forest – this makes the forest industry functionally an HCV. Similarly, Alberta has strong policy framework supporting the energy sector. Economic benefits from these sectors provide significant "value" to communities. For simplicity, energy and forest products are not specifically designated HCV.

Aggregates
There are many aggregate pits which contribute to local economic activity and are instrumental in road maintenance on the FMA area. Often this sector is of benefit to smaller communities and Indigenous communities. As a support for the larger resource sector, it is not considered HCV for the same reason as discussed above. Impact from forest management on aggregate pits would be negligible.

Hunting / Trapping / Fishing / Outfitting and Tourism[16]
There are businesses in or near the FMA area that provide outdoor experiences from light recreation to full outfitting services both for hunting and fishing. The Lakeland area east and north of Edmonton, ranging into the FMA area, is an area characterized by many outdoor opportunities. The Lakeland area is not a precise location; rather it is a region of Alberta. As such, it is at a larger scale than normally considered an HCV for geographical values.

As well, subsistence hunting and fishing is important for food, social and ceremonial purposes. There are approximately 400 traplines that overlap the FMA area. Some of these traplines are used recreationally, while others are used to provide a livelihood. Traplines and hunting and fishing locales were not designated HCV.

While other areas of Alberta attract tourists from around the world, there is limited tourism in this part of Alberta, and none of the existing tourism facilities are affected by forestry operations. Forestry operations consider local impacts through appropriate mitigative measures and Operating Ground Rules.

Non-timber Forest Values[17]
Plants, including those used for food and medicine, were assessed as potential HCVs. As mentioned above, berry picking is no longer done on a commercial scale, but it is a culturally important activity for Indigenous peoples. Berry patches are maintained at the landscape level via Al-Pac's ecosystem-based management approach to forest management. Culturally important plants will be captured on an ongoing basis through engagement and consultation with communities as site-specific cultural values but berries were not considered as an HCV here, as they cannot be considered a significant source of livelihoods.

Recreation
Recreational activities on the FMA area range from canoeing, hiking, skiing, and ATVing, to snowmobiling. Hunting and fishing are also popular recreational activities on the forest. Recreation and tourism contribute to the economies and livelihoods of several communities, but do not contribute to local economies in a significant way. Given this, recreational activities were not considered as regionally significant HCVs here but they do contribute to cultural HCVs in element 18.

[16] Source Al Pac FMP Reviewed January 2020.
[17] Source Al-Pac FMP. Reviewed January 2020.

Trails

In the more populated areas close to Al-Pac's FMA area, there are recreation trail networks used by the public. The trail networks are widespread and part of the infrastructure of the area. Al-Pac reached out to the known groups that use and maintain these trails to request input regarding the HCV process. Several snowmobile trails as well as a portion of the TransCanada Trail were identified. Interaction between trails and forestry is guided by the Operating Ground Rules and is cooperative with little conflict. Because the trail network is spread across the landscape, rather than in a specific location, the trail system was not designated HCV.

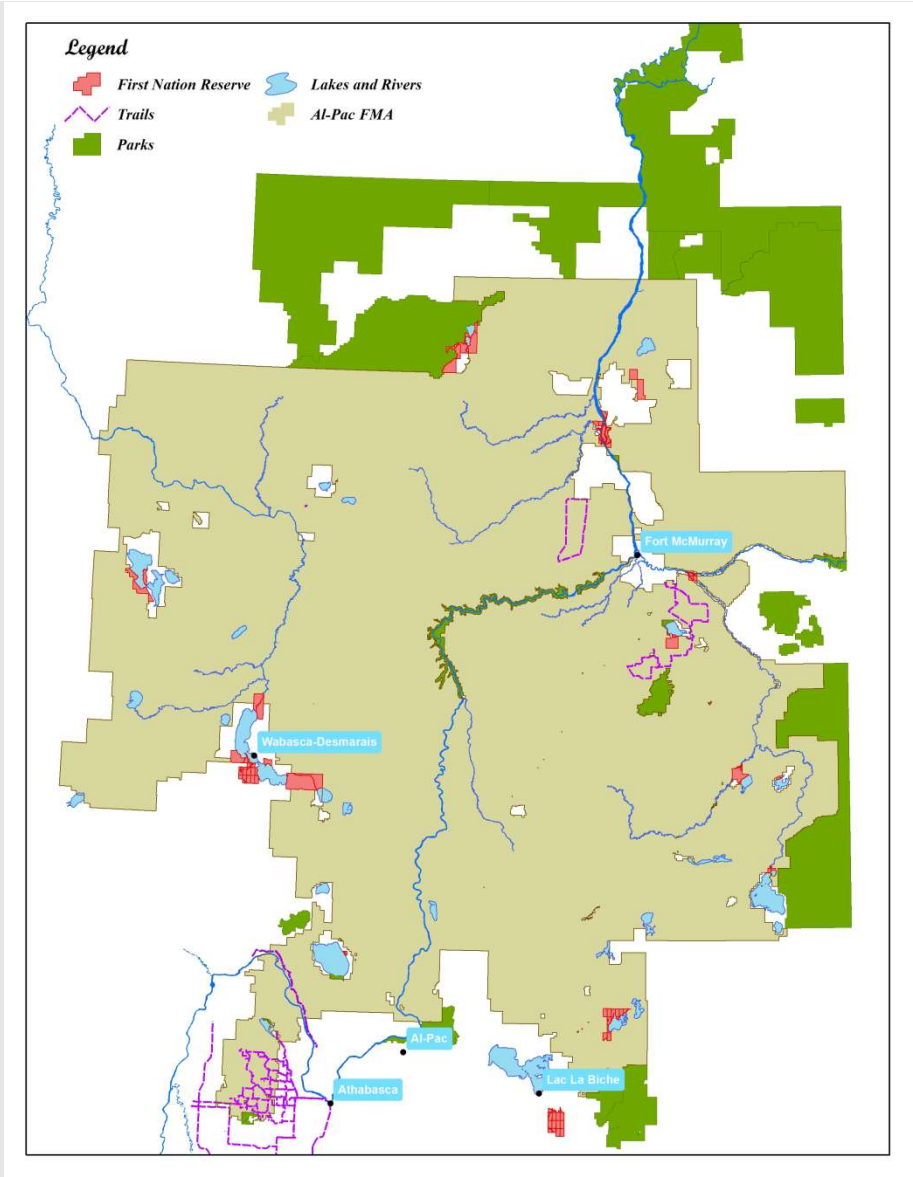

Figure 9. Recreational Values within the FMA area – trails, parks, waterbodies.

Fuelwood

Local residents use wood for heating. Fuelwood as an HCV could be important if small operators were supporting themselves through this activity but in fact, Al-Pac provides donations of fuel wood to Indigenous communities. This is not a commercial activity and is not considered an HCV in this element.

Important Economic and Cultural Waterbodies in the FMA Area
Waterbodies important to local and Indigenous communities for food, social and cultural reasons are listed in Table 15. These waterbodies are listed because they have both economic (livelihood) and cultural importance. In many cases, forestry is managed near these areas under special arrangements intended to protect the economic and cultural values of the waterbodies. They are also referenced in element 18, which addresses specific forest areas tied to the traditional cultural identity of the local community, because of their frequent and historical use.

Table 15. Important Economic and Cultural Waterbodies in the FMA Area

Heart Lake	Chipewyan Lake
North Wabasca Lake	Graham Lake
South Wabasca Lake	Sandy Lake
Calling Lake	Gregoire Lake
Winefred Lake	Moose (Namur) Lake
Peerless lake	Athabasca River
Cowper Lake	Christina River

***HCV Designation Decision**:*
Access to Crown land for the purposes of recreational and non-commercial consumptive use is generally unrestricted in this area. This element focuses on the commercial, including subsistence, activities that support livelihoods. There is a significant contribution from businesses such as tourism, recreation, trapping and other enterprises. Protection of these businesses occurs to the extent possible under current land use policies and is addressed by the forest manager through the FMP process for the protection of non-timber values. The needs of other forest users, such as trappers, are taken into account at various points in the forest planning process, including strategic planning (i.e. FMP development), tactical planning (GDP consultation), and operational planning (e.g. contacting individual trappers on whose traplines harvest is being planned). Fuel wood represents a basic need for local residents and is addressed through company cooperation with communities. Food and medicine represent critical cultural resources to local Indigenous communities and are further discussed and designated in element 18. Livelihoods are a fundamental concern of commercial activities and these are a focus of forest planning. There were no HCVs designated in this element.

Category 6) Forest areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

18) Is the traditional cultural identity of the local community particularly tied to a specific forest area?

Rationale:

In the context of this standard, 'local' is defined in the FSC National Forest Stewardship Standard of Canada. Local communities as defined within the standard are "communities that are in or adjacent to the Management Unit*, and also those that are close enough to have a significant impact on the economy or the environmental values* of the Management Unit* or to have their economies, collective rights* or environmental values significantly affected by the forest management activities* on the Management Unit*. In Canada, communities to be considered are the ones officially registered as a municipality with the Canada Revenue Agency. Respective provincial lists may be also used."

In the context of the HCV assessment, the assessment under element 18 will also include an assessment of Indigenous communities with traditional territories that overlap the FMA area but are not necessarily recognized as municipalities by the Canada Revenue Agency.

Assessment Methodology:

- Indigenous community publicly sourced information
- Forest Management Plan, General Development Plan
- Al-Pac discussions and correspondence with First Nations, Métis Settlements, and Métis Regions during forest management planning consultation and engagement sessions. Confidential information has been excluded.
- Archeological Sites Alberta
- Historical Resource Values
- Canadian Heritage Rivers System

Assessment Results:

The answer to the Framework question "Do the communities consider the forests to be culturally significant?" is categorically - yes. This section is probably the most sensitive subject material assessed as HCVs. Even livelihoods (the last element) tend to attract less notice than the protection of individual and community cultural values. These values include Indigenous and non–Indigenous values and public values that are widely known and appreciated as a contribution to the culture of northeastern Alberta. Both non-confidential and confidential values are considered in this element.

For confidential values, Al-Pac has a process of handling information that respects the confidentiality and safeguards the values. For this reason, the details of the agreements between the communities and Al-Pac are not discussed in this report; only the process is discussed. Further information can be obtained by contacting Al-Pac team members responsible for certification.

Do the communities consider the forest as culturally significant? Indigenous land use sites include harvesting areas (non-timber), cabins and overnight sites, trapping, hunting or fishing camps, sacred sites, ceremonial sites and gathering areas. There are many other examples and virtually all aspects of local Indigenous life and culture were (and to a great extent still are) intertwined with the land. The materials needed to practice a traditional lifestyle come from the forest. For instance, animals relied upon for food, as well as plants needed for food and medicine originate from the forest. Some of the forest uses have changed over the years but the forests remain as critical as ever for Indigenous communities.

The following initiatives and programs are described in this element:

- Government Regulatory Consultation by Al-Pac
- Community Relationship Building
- Al-Pac Approach to Cultural Values Protection
- Protection of Cultural Heritage Values – Archeological Values
- Heritage Rivers

Government Regulatory Consultation by Al-Pac

The Government of Alberta identifies which activities require consultation with Indigenous communities (First Nations and Métis Settlements) based on the location of the activity. Al-Pac follows the regulatory requirements listed below. The Government of Alberta's role is to:

1. Provide a pre-consultation assessment to Al-Pac.
2. Provide consistent advice regarding Al-Pac's consultation process planning.
3. Assess and determine the adequacy of Al-Pac's consultation efforts.
4. Seek verification from the specific First Nations and Métis Settlements regarding Al-Pac's Record of Consultation.

Stages of consultation:

1. Pre-consultation assessment
2. Information sharing
3. Determining the level of consultation
4. Exploring concerns
5. Verifying the record of consultancy
6. Determining consultancy adequacy

Among other regulatory consultation obligations to First Nation communities and Métis Settlements, Al-Pac:

1. Maintains a record of consultation using the GOA consultation log template.
2. Compiles a completed record of consultation.
3. Provides the record of consultation activities to those First Nations and Métis Settlements with whom consultation activities occurred.
4. Submits to GOA a consultation summary requesting a consultation adequacy decision.

The discussion of confidential values in this section deals with the procedures for safeguarding values and general examples of the types of values and how they are safeguarded. For confidentiality reasons specific information about community values, especially HCVs, cannot be listed. However, it is important to discuss the overarching system in place that protects the values. The system is more complex than can be completely described here, but below we provide a brief overview.

Community Relationship Building

Al-Pac focuses on long-term relationship building. There are many aspects to this: education and training opportunities, investment, sensitive site protection and mutually agreed upon culturally appropriate agreements. Relationship building leads to trust between the company and the communities which then provides a solid footing for discussion about how best to protect values. The process for understanding each community's values and then determining a mitigation strategy depends on several things.

Activities that Al-Pac participates in to build relationships:

- FMA area community meetings, open houses and engagements
- Team members in community organizations
- Education supports – Inside Education, scholarships, internships Portage College Partnership and Outland Youth Education Program
- Participation in community events / trade fairs / career fairs / conferences
- Presentations on specific topics or issues when requested
- Information and awareness – publication of regular online vignettes
- Internal newsletter, website and other information publications and vehicles
- Ongoing engagement with community liaison offices
- Al-Pac Landscape Advisory Group
- Community capacity building initiatives

Each community has a different capacity for engaging with Al-Pac and engagement occurs in a culturally-appropriate manner as directed by the community. Some Indigenous communities have an internal system for values mapping and monitoring of the community's values, such as the Community Knowledge Keepers. Other communities utilize Al-Pac to track their values. This provides a seamless sharing of values and

requires a high level of trust. For all communities, Al-Pac shares areas planned for harvest with the community for their review through the 5 year General Development Plan.

The full list of Indigenous communities with traditional territory (provided by the Government of Alberta) in the FMA area can be found in Table 13.

Al-Pac Approach to Cultural Values Protection
In 2014, Al-Pac began consultation on the Alberta-Pacific FMA Area 2015-2025 Forest Management Plan (FMP). After over four years of consultation with affected communities, the FMP was approved by the Government of Alberta in May, 2018. As the FMA holder, Al-Pac is responsible for the development and maintenance of the FMP, including Indigenous consultation and stakeholder engagement.

The FMP is the first step in the forest management planning process. This important document considers how to maintain a sustainable forest over the long term. Once completed, the FMP becomes the guide to forest stewardship on the FMA area for 10 years, providing the base from which more detailed planning is done. As a quota holder, Northland Forest Products Limited (NFPL) provides input into the development of the FMP. Both companies are bound by the conditions of the FMP.

While the FMP covers a 10 year period, the General Development Plan (GDP) projects harvest and road building activities for a five-year period. The GDP is a rolling plan, meaning that, although it covers a five-year period, it is updated and consulted on regularly within that 5-year period. Al-Pac and NFPL began developing integrated GDPs in 2017. Consultation and community engagement is required for GDP development. In addition to consultation on the FMP and GDP, the companies gather input from First Nations, Métis, trappers, communities and stakeholders to incorporate into operational planning whenever possible.

Forest harvest plans are submitted to Alberta Culture for review and approval. During this review Alberta Culture will assess if blocks will impact any Traditional Use Sites (HRV4C). If Traditional Use Sites are identified, consultation will be required where input from the Indigenous community that registered the sites will be incorporated into operational planning.

Forest Harvest Plans and Archeological Assessments
The forest harvest planning links the higher-level plans to forestry operations on the ground. A few years prior to an area being harvested, forest planners begin forest harvest planning. The first step is to consider all of the information they have for the area planned for harvest. This includes reviewing Alberta vegetation inventory (AVI) mapping for the area, orthophotography, topographic information and information provided by communities and stakeholders during GDP consultation and engagement. They use this information to begin drawing the boundaries of the harvest areas, as well as the road network needed to get from the permanent roads to the harvest areas.

Al-Pac and NFPL acquire the services of archaeological consultants to complete Historical Resources Reviews for forest harvest plans. The reviews include field investigations to identify archeological resource sites so they can be avoided. In addition, field crews are trained to assess, document and report on all cultural features they may happen upon while in the field. Through this process, archeological sites which are discovered and registered are regarded as HCVs.

Trappers
The companies have a responsibility to mitigate or lessen their impact on other resource users, such as trappers. Forest operations do have the potential to disrupt or hamper trapping. Al-Pac employs a Trapper Coordinator who works directly with the area's trappers.

Early in the forest management process, the Trapper Coordinator will contact trappers that may be affected by the forest operations with a letter and a map. Then the Trapper Coordinator typically follows up with a phone call, visits and, often, a trapline tour of the proposed timber harvest area. Not only does the process enable the sharing of knowledge about the forest operations, it also allows the trapper to share knowledge, such as:

- Location of trapline assets, cabins, trails and other values that are important to the trapper.
- Areas and times of the year that are important to trapping success and where forestry operations should be adjusted.

The notification process helps the Trapper Coordinator and trapper find ways to minimize or resolve potential conflicts between timber harvest and trapping. The information collected by the Trapper Coordinator is relayed to the forest planners and layout crews to ensure that any modifications to harvest or other mitigative measures needed are incorporated early in the process.

In addition to formal consultation, archeological assessments and trapper engagement, Al-Pac works with Indigenous communities to build relationships that allow for the further sharing of knowledge and information through data sharing agreements and traditional land use studies.

Example: Important Indigenous Viewscapes and Waterways
Several viewscapes and waterways within the FMA area were identified during FMP consultation as areas of traditional significance to First Nation communities (Table 15). These waterbodies are listed because they have both economic (livelihoods) and cultural importance. A number of these have special arrangements for forestry management near them. As an example, areas were identified spatially as 20-year deferral areas for deciduous timber harvesting. These viewscapes would be considered management strategies to maintain the lakes as High Conservation Values where the communities practice traditional activities.

While not every lake within Al-Pac's FMA area would be considered a HCV, in the context of Cultural HCVs, lakes identified through consultation or engagement with communities or stakeholders of holding or being associated with significant cultural values would be assessed for consideration as HCVs.

Example: Old and Mature Forest
In discussions with communities, a wide range of values are covered, depending on the interests and direction of each community. For example, the presence of old and mature forest close to Indigenous communities was raised by LAG during consultation. Old forest provides many benefits, and stakeholders identified the importance of retaining old forests near communities when feasible. Old forests provide both ecological and cultural value to communities. Ongoing and regular consultation and engagement with communities allows for identification of diverse concerns.

Example: Old Conklin Road (OCR)
Through engagement with communities and the LAG it has been recognized that access provided by the OCR is important for the practice of traditional uses such as hunting and gathering. Due to this access, there may be an increased potential for cultural HCVs (e.g. trails, campsites) to occur along the OCR. Through annual engagement and consultation on forest plans and operations with communities it is expected that HCVs will be identified and strategies developed to maintain or enhance the identified site-specific cultural values in areas where Al-Pac or NFPL operations are being planned. Additionally, Al-Pac can work within its sphere of influence to highlight the importance of the OCR for access to areas important for the practice of traditional uses.

Example: Site Specific Cultural Values
Through engagement and consultation with communities and stakeholders Al-Pac and NFPL become aware of site-specific cultural values. These individual values are diverse and, as an example, can include

trails, campsites, berry gathering locations, and cabins. Site specific cultural values will be assessed for consideration as HCVs.

Example: Berry Gathering Areas
It is important to recognize that some cultural values may not be managed as HCVs as they may be common and dynamic on the landscape. One example of this would be berry patches that, as forests grow and change, will often move around on the landscape. Forest planning that maintains the range of natural variation can work to maintain the abundance and distribution of berry patches across the forest. In fact, in some cases, forest activities can actually encourage berry production. This being said, Al-Pac and NFPL can consider practices to help maintain important berry patches and some gathering areas may have other cultural values associated with them that should be considered relative to HCV status,

Engagement Activities
- Quarterly Landscape Advisory Group meetings – including June field-tour in FMA area
- Ongoing forest planning consultation/engagement with affected Indigenous communities
- Community woodlands operations meetings
- Community Liaison Offices
- Membership in FSC
- 5-Year FMP Stewardship report
- Ongoing engagement with First Nations Economic Development Officers

Protection of Cultural Heritage Values – Archeological Values
As discussed above, archaeologists conduct field investigations to identify archeological resource sites so they can be avoided. All archeological sites which are discovered and registered are regarded as HCVs.

Heritage Rivers
The Clearwater River transects the FMA area southeast of Fort McMurray and was designated by the Canadian Heritage Rivers System (CHRS) as a heritage river. The river was designated as a heritage river on the strength of its outstanding natural and cultural heritage features, as well as its diverse opportunities for recreation. The Saskatchewan section was designated in 1987, while the Alberta section, which includes the 31-km lower section of the Christina River, was designated in 2003. The total length of the designation is 326 km. Although the portions of the Clearwater and the Christina Rivers designated as heritage rivers within Alberta are not within Al-Pac's FMA area, upstream sections and/or portions of these rivers' watersheds do fall within the FMA area, therefore Al-Pac's operations have the potential to affect the designated portions.

The Athabasca River was also designated in the headwaters area. It winds 1,538 km through mountains, prairies, forests and muskeg from the Columbia Icefield in Jasper National Park, Alberta, to Lake Athabasca in Wood Buffalo National Park, in the Northwest Territories. A 168-km section of the Athabasca River was designated to the CHRS in 1989 in recognition of its outstanding natural and cultural values and its importance for river recreation. The designated section lies entirely within Jasper National Park. Because of its distance from the FMA area, it is not considered an HCV under this assessment.

***HCV Designation Decision**:*
Due to their high cultural and historical significance to communities, and their natural heritage values, the following are designated HCV:

- Known site-specific Indigenous values (as documented in meetings; confidential – not on publicly available maps)
- Archeological sites (only sites that have been professionally verified to hold cultural artifacts, either Indigenous or non-Indigenous are HCVs)

- The portion of the Clearwater River and Christina River designated as Heritage by Canadian Heritage Rivers System
- Lakes important to Indigenous communities [18]

19) Is there a significant overlap of values (ecological and/or cultural) that individually did not meet HCV thresholds but collectively constitute HCVs?

Rationale:
The forest managers and report authors reviewed the list of values assessed through each of the elements of the framework and looked for areas of overlap. Typically, these follow large natural features such as significant lakes and waterways. Cultural features overlying rich resource areas can lead to overlap warranting HCV designation. For example, significant hunting areas near communities can generate both commercial value and cultural interest. In this forest we judged these values to be important and widespread. There has already been a significant effort at regulating use and recognizing conservation values. This is largely represented in the first 18 elements of this report.

Review by the planning team did not identify any new areas appropriate for HCV status during the initial review.

HCV Designation Decision:
There are no overlapping HCVs[19] designated that have not been previously designated.

Phase 2: Managing and Monitoring HCVs in Al-Pac FMA Area

The overall goal of managing HCV in keeping with the FSC criterion 9.3 is to safeguard the value. Several points from the standard have guided the Al-Pac approach to managing HCVs:

- The Forest Management Plan provides the direction for HCV management; there is no separate list of prescriptions or objectives for HCVs.
- "Management strategies ...are developed and effective to maintain or enhance HCVs" – detailed prescriptions are written for the values during the planning process and are shown to be effective.
- "Maintenance or enhancement" – based on the concept of no net loss, managers must aim at ensuring the value is sustained and use a precautionary approach.
- "Precautionary approach" – the precautionary approach sets a high standard for management – it requires the organization to take measures to prevent damage even when scientific information is incomplete.

It is worth repeating that the plan and the planning exercise drive the approach to HCVs. The planning process contains a significant amount of public consultation and engagement, which has also been verified to meet FSC standards through the certification assessment process.

Al-Pac has a robust monitoring program at the centre of an adaptive management approach to implementation and active learning. Al-Pac's ecosystem-based approach, inspired by natural disturbance patterns and implemented at a landscape scale, relies upon the feedback from both research and monitoring to assess the effects and effectiveness of their management strategies. Al-Pac directly monitors some aspects of the operations, while others are done in partnership and

[18] This designation was reviewed in July 2024, including a review of the web info and other sources.
[19] This designation was reviewed in July 2024, including a review of the web info and other sources.

collaboration with the Government of Alberta and other agencies. The values, objectives, indicators and targets (VOIT) monitoring reporting schedule associated with the Forest Management Plan is provided in the FMP (Appendix I of Chapter 5 in the FMP). Both the University of Alberta and the Alberta Biodiversity Monitoring Institute collaborate extensively with Al-Pac to conduct ecological monitoring. Collaborations with the Canadian Forest Service, the Canadian Oil Sands Innovation Alliance (COSIA) and many energy and pipeline companies contribute additional scope to several of the research and monitoring programs Al-Pac is involved in. Alberta-based, forest industry funded research and monitoring programs (Healthy Landscapes Program (HLP), Western Boreal Growth and Yield (WESBOGY) are also a central aspect of Al-Pac's investment in new knowledge and tools. While FMP-related monitoring is reported every 5 years in the Al-Pac FMA area Stewardship report, a variety of reports are prepared periodically and submitted to the GOA and/or made available to the public on Al-Pac's website.

Table 16 provides an overview of the HCV values that were identified in this report. The Company is responsible for implementation of the detailed management prescription to maintain or enhance these values. These prescriptions must be shown to be effective based on current science. The table also outlines the responsibility of the company and outside agencies for monitoring and surveys. In the table, specific contact information is provided for individuals with local or provincial responsibility for monitoring of the effectiveness of the prescription. Effectiveness monitoring is the practical link to the precautionary principle - a hallmark of HCV management in the FSC standard.

Monitoring for HCV attributes is also described in this table. Monitoring for designated HCV attributes for which there is a management prescription are listed here. The information provided covers only who is responsible and basic information on the monitoring process. It is beyond the scope of this report to review all of the monitoring procedures. For further information, contact the expert listed in the right column of the Table.

Table 16. Overview of HCV management and monitoring.

HCV	Attribute and Forestry Risk	Prescription, Management Direction, Guidance from Planning, Training or Communications	Monitoring for Compliance, Effectiveness and Status	Schedule & Experts
Species at Risk (SAR)	SAR managed through Natural Range of Variation approach: Species Canada Warbler; Black-throated Green Warbler; Bay-Breasted Warbler; Cape May Warbler; Evening Grosbeak; Olive-sided Flycatcher; Yellow-banded Bumble Bee; **Risk** Potential for long-term, landscape-level habitat alteration, as many of these species live in upland mesic habitat that is targeted for timber harvest.	The principal approach to forest management and multi-species conservation is based on modelling forest harvesting strategies after natural disturbances, predominantly wildfire (see FMP p 12). The boreal forest is a fire-adapted system, and Al-Pac attempts to mimic the patterns of wildfire to maintain forest types and ages within the natural range of variation. Al-Pac research has investigated fire frequency, size, intensity and biotic response of historical fires, and they use these characteristics to guide the design of timber harvest areas and stand structure. Al-Pac and NFPL use a variety of harvest techniques, including following natural stand boundaries when designing harvest areas, using different shapes and sizes for harvest areas across the FMA area, leaving merchantable volume of trees in harvest areas, and using understory protection techniques in mixedwood stands to maintain the spruce understory. This approach is well-suited to landscape-level management of upland forest species that occur in the same ecosystems that Al-Pac and NFPL harvest; because every species has different specific habitat requirements, this approach based on maintaining the natural range of variation (NRV) should be capable of maintaining habitat for each species across meaningful time and space. Where appropriate for individual species, site-specific management prescriptions have also been developed. Training on identifying species at risk and their habitat is provided for relevant Al-Pac and NFPL team members and contractors, including layout crews and harvest operators.	Compliance around protection of identified species at risk locations is monitored through field operational monitoring (FOMs); however, the reality is that most species at risk present will never be detected – either due to their cryptic nature, or only being active or detectable at specific times of day or year. Therefore, landscape-level monitoring is the principal tool Al-Pac uses to assess species at risk. Monitoring of NRV management is done through: • updates to FMA area inventory - forest cover is the driver for habitat availability for all wildlife including SAR. Accurate inventory is necessary for habitat analysis. • recalculation of FMP analysis of wildlife habitat supply modelling - Age classes are targeted to fall within +/- 25% of the mean for old forest NRV class for each strata. • ensuring old forest is continuously present on the landscape. All age classes are considered and balanced over long term. The variance target is based on landscape analysis by Al-Pac and D. Andison (literature is in the References) • GOA approval of direction • Ongoing research on NRV by Al-Pac. See Andison (Appendix 2, 2015 FMP)	Compliance monitoring is ongoing ABMI monitoring is ongoing, with an Al-Pac report every 5 years For more information, contact Tom Habib

HCV	Attribute and Forestry Risk	Prescription, Management Direction, Guidance from Planning, Training or Communications	Monitoring for Compliance, Effectiveness and Status	Schedule & Experts
			Monitoring of species at risk is conducted by outside agencies, supported by Al-Pac depending on the species. This includes the following: • Alberta Biodiversity Monitoring Institute (ABMI) operates a long-term, province-wide monitoring program. Al-Pac commissions a report from ABMI on the status of biodiversity in the FMA area every 5 years. • Research to assess long-term migratory songbird responses to alternative forest harvest techniques and management strategies (Leston et al. 2018, 2020; Charchuk & Bayne 2016). • Research to assess long-term biodiversity response to harvest, in comparison with same-age burns (Huggard et al. 2014). • Research efforts focussed on species of particular management concern as revealed by monitoring efforts. For example Black-Throated Green Warbler showed a slight decline in the 2020 ABMI report. This species is now a research focus with efforts led by Dr. Erin Bayne underway (as of summer 2022) to better understand its interannual population dynamics and influence of cumulative industrial footprint.	

HCV	Attribute and Forestry Risk	Prescription, Management Direction, Guidance from Planning, Training or Communications	Monitoring for Compliance, Effectiveness and Status	Schedule & Experts
Species at Risk	Species managed through riparian zone management: Western Toad; Horned Grebe; Lesser Yellowlegs; Rusty Blackbird; White-winged Scoter; Western Grebe; Yellow Rail; Arctic Grayling **Risk** Local habitat disturbance in riparian areas and water quality (e.g. sedimentation from roads)	Risks from forestry are generally low for these species, although grebes and scoters may nest in upland areas adjacent to waterbodies. Riparian and wetland buffers outlined in the OGRs are the principal management strategy. Buffer size depends on the watercourse, but large lakes most likely to support grebes and scoters are buffered by 100m. Stream-crossing protocols also minimize sedimentation from roads into watercourses, which is important for maintaining water quality.	Compliance around riparian buffers is conducted internally through field operational monitoring (FOMs) and verified by GOA. Stream crossings are inspected regularly, and any problems (e.g. hanging culverts) are addressed promptly.	Compliance monitoring is ongoing For more information, contact Tom Habib

HCV	Attribute and Forestry Risk	Prescription, Management Direction, Guidance from Planning, Training or Communications	Monitoring for Compliance, Effectiveness and Status	Schedule & Experts
Species at Risk	Species with site-specific management prescriptions: Barn Swallow; Barred Owl; Little Brown Myotis; Northern Myotis; Wolverine **Risk** Loss of localized habitat features	Barn Swallows may nest under bridges in the FMA area. Management involves inspecting bridges for nests prior to starting any maintenance and delaying maintenance until after the nesting season unless it is a critical safety issue. Potential Barred Owl nesting trees (deciduous snags >34cm DBH) are identified during layout and operations and included in retention patches Northern & Little Brown Myotis management includes identifying potential roosting trees (large-diameter snags with loose bark) during layout and operations and including them in retention patches. Wolverine dens are buffered by 100m, in line with OGRs. These site-specific management considerations are used in addition to NRV-based management at the landscape scale. In particular, Barred Owl habitat supply is modelled over the long term as part of the FMP, and this is the primary tool for maintaining habitat for this species in the FMA area.	OGR-based management (wolverine den buffers) are monitored for compliance via FOMs and verified by GOA. Barn Swallow inspections are conducted annually by Al-Pac.	Compliance monitoring is ongoing. For more information, contact Tom Habib
Species at Risk	Trumpeter swan lakes **Risk** Disturbance during breeding season	Special Management Zones are created for Trumpeter Swan lakes OGRs 2.8.5-2.8.7 stipulate (paraphrased): • No timber harvesting or road construction within 200 m of high-water mark for identified lakes or water bodies. • Apr. 1 to Sept 30 no activity within 800 m of high-water mark of identified lakes or water bodies. • Oct 1 to March 31, within 800m of high-water mark of identified lakes or water bodies, only temporary roads shall be constructed and used. Layout staff training for special management zones.	Al-Pac/NFPL staff conduct compliance inspections following the approved harvest plan. Effectiveness of the prescription (at left) is based on Schmidt et al. 2009. Trumpeter Swan provincial status was downlisted from “Threatened’ to “Special Concern” in 2014, indicating a positive trend.	Compliance monitoring is ongoing For more information, contact Tom Habib

HCV	Attribute and Forestry Risk	Prescription, Management Direction, Guidance from Planning, Training or Communications	Monitoring for Compliance, Effectiveness and Status	Schedule & Experts
Regionally significant critical habitat for seasonal concentration of species	Heronries Pelican nesting colonies Tern colonies **Risk** Disturbance during breeding season	Heronries have a buffer of 100 m assigned as designated in the Operating Ground Rules. Restrictions apply to all activities within the buffer during the active breeding season and no development of infrastructure is permitted at any time. This designation is applied through the Forest Harvest Plan which provides the compliance and regulatory authority.	Al-Pac/NFPL staff conduct compliance inspections following the approved harvest plan. Effectiveness of buffer size and other restrictions is based on a number of studies. One of the most pertinent, for this type of forest (boreal) and continuous forest cover was by Naylor (2009) on 150 heronries in north and central Ontario. Ontario determined that conventional clearcutting is permitted within 151-300 m of small active colonies (Naylor, B.J. 2009. Forest management and stick-nesting birds: new direction for mitigation in Ontario. For. Chron. 85:235-244).	Compliance monitoring is ongoing For more information, contact Tom Habib
	Grayling Spawning **Risk** Sedimentation due to harvest activities and roads	Management of grayling spawning habitat is predominantly achieved through riparian buffers outlined in the OGRs. In addition, the layout manual provides training for layout staff to identify potential grayling spawning habitat when working in grayling-containing basins of the FMA area. Direct observation of grayling is unlikely, as it only occurs for a brief period in early-to-mid May. Stream-crossing protocols also minimize sedimentation into watercourses, which is important for maintaining water quality.	OGR buffers are monitored internally through FOMs. GOA surveillance provides another level of assurance. Stream crossings are inspected regularly, and any problems (e.g. hanging culverts) are addressed promptly.	Compliance monitoring is ongoing. Stream crossing inspections conducted on ongoing basis by expert consultant. For more information, contact Tom Habib

HCV	Attribute and Forestry Risk	Prescription, Management Direction, Guidance from Planning, Training or Communications	Monitoring for Compliance, Effectiveness and Status	Schedule & Experts
Featured Species Caribou	Featured Species: Woodland Caribou **Risk** Cumulative, landscape-level habitat change from multiple industrial sectors leading to altered predator-prey system (wolf-moose-deer-caribou)	Caribou management includes several strategic and tactical practices. These include large, 20-year forestry deferrals within large portions of caribou range; collaborating with GOA on caribou range planning initiatives; collaboration with government and other industrial sectors on caribou research and habitat restoration; access management to reduce linear features; site specific layout requirements for pine stands with high amounts of lichen; and several OGRs (Sections 2.8 and 4.2.6) related to operating within caribou range. See Al-Pac's Caribou Conservation Strategy (2019) for details.	Compliance monitoring around OGRs is conducted internally via FOMs, and by GOA. Caribou population monitoring is conducted by GOA via ongoing studies, including telemetry, aerial surveys, and fecal DNA (McFarlane et al. 2020). Al-Pac supports research and monitoring efforts into caribou and their habitat via the Regional Industry Caribou Collaboration (RICC) program.	Compliance monitoring is ongoing. Caribou population monitoring: Annual estimates from GOA For more information, contact Tom Habib
Protected Area Land-use Designations (Table 9)	Conservation Areas adjacent to boundaries of Al-Pac FMA area: • Provincial Parks • Wildland Provincial Parks • Provincial Rec Areas • Wilderness Areas • Ecological Reserves • Natural Areas **Risk** Impacts to adjacent parks	Boundary protection • Compliance with harvest block layout - no incursion • Operating Ground Rules • By definition, not within FMA area - National Parks, Provincial Parks • Link to NE AB NW SK Protected Areas Gap Analysis project	Field Compliance by Field Operational monitoring GOA surveillance provides another level of assurance	Compliance monitoring is ongoing. For more information, contact Tom Habib

HCV	Attribute and Forestry Risk	Prescription, Management Direction, Guidance from Planning, Training or Communications	Monitoring for Compliance, Effectiveness and Status	Schedule & Experts
Rare Wetland Types	Aquatic Bed; Graminoid Poor Fen; Emergent Marsh; Meadow Marsh; Mudflats; Open Bog **Risk** Sedimentation and altered hydrology	• Riparian and wetland buffers outlined in the OGRs • Restrictions on forestry activity in wetlands • Minimize sedimentation for water quality • Training operators for road installation and maintenance to protect water quality	Field Compliance by Field Operational monitoring GOA surveillance provides another level of assurance. Landscape and human footprint monitoring is conducted by ABMI.	Compliance monitoring is ongoing. For more information, contact Tom Habib
Fire Smart Community Zone	Communities with Fire Smart plan **Risk** Not applicable; Purpose of HCV is risk reduction	• In cooperation with communities • Compliance with harvest block layout - no incursion • Follow operational prescription to minimize risk from wildfire	Follow-up with individual communities for appropriate management implementation	No specific monitoring schedule. For more information, contact Aaron Hayward

Indigenous Values	Self identified community values related to the culture and livelihoods within the communities. **Risk** Values may be diminished by forestry activities	HCV management for Indigenous values is centered around a relationship building process in line with Principle 3 of the National Forest Stewardship Standard for Canada. The process will be specific to the community or individual to which the value pertains. Activities included in this relationship building process include consultation on Al-Pac's Forest Management Plan (FMP) and General Development Plan (GDP), and trapper engagement. Once values are identified, the approach to maintain that value will be determined through engagement with the community or values holder. Examples of management strategies include avoidance, buffers or maintenance through other means agreed to by the community or values holder. Al-Pac's 2015-2025 FMP is a strategic-level plan that was consulted on with Indigenous communities from early 2014 to late 2017, it included areas projected to be available for harvest to Al-Pac and quota holders over the 10-year period. Al-Pac and Northland Forest Products Ltd. (NFPL) have an integrated General Development Plan (GDP) that projects activities for a five-year period. The GDP is a rolling plan, meaning that, although it covers a five-year period, it is updated and consulted on regularly within that five-year period with Indigenous communities. This enables proactive communication with communities around the maintenance and enhancement of identified values. The GDP includes a forecast of the areas scheduled for harvest, the harvest volumes and road requirements. It guides the activities within the FMA area and is implemented through the more detailed Annual Operating Plan. Al-Pac employs a Trapper Coordinator who works directly with area trappers. Early in the forest management process, the Coordinator contacts trappers that may be affected by the forest operations with a letter and a map. The Coordinator typically follows up with a phone call,	Management activities described (left) are monitored for implementation and effectiveness. Al-Pac/NFPL are required to consult with Indigenous communities and report values affected by operations to GOA through the FMP and GDP consultation processes. The values and agreed upon mitigation measures are captured in the Records of Consultation, that are sent to Indigenous communities to confirm values captured and any agreed-upon mitigation measures. Compliance with GDP direction, the Annual Operating Plan and forest harvest plans is determined through site level inspection. This is normal supervision and post harvest inspection by Al-Pac/NFPL, regardless of HCV status. The GOA also does compliance audits to verify the company compliance is effective. Additionally, communities and trappers may do additional checks and provide feedback. Evaluating the effectiveness of management activities that protect social values is determined through dialogue with communities and trappers. Al-Pac engages with communities and trappers in open dialogue that provides opportunities for feedback. This is demonstrated in the number of meetings held with communities and in the number of contacts with trappers. Trapper communications and commitments made are tracked in the Trapper Coordinator Database.	Annual meetings for GDP review or as requested by communities. Contact information for each community is available from liaison staff For more information, contact Kiera Stewart-Shepherd

		visits and, often, a trapline tour of the proposed timber harvest area. This process enables the sharing of knowledge about forest operations, and also allows the trapper to share knowledge, such as: • Location of trapline assets, cabins, trails and other values that are important to the trapper. • Areas and times of the year that are important to trapping success and where forestry operations should be adjusted. The notification process helps the Trapper Coordinator and trapper find ways to minimize or resolve potential implications of operations on trapper values. The information collected by the Trapper Coordinator is relayed to the forest planners and layout crews to ensure that any modifications to harvest or other mitigative measures needed are incorporated early in the process. In addition to formal consultation and trapper engagement, Al-Pac works with Indigenous communities to build relationships that allow for the further sharing of knowledge and information through data sharing agreements and traditional land use studies. As a precautionary measure, if potential traditional trails are discovered a standard 30 metre buffer will be used in the absence of dialogue available to determine mitigation measures. Other discovered potential cultural HCV sites will be reviewed by Al-Pac's Planning and Indigenous Relations teams on case-by-case basis and a larger than 30 metre sensitive site buffer will be applied when determined necessary to preserve the value until additional information or dialogue determines other appropriate mitigation measures or confirms that the discovered site is not a HCV.		

HCV	Attribute and Forestry Risk	Prescription, Management Direction, Guidance from Planning, Training or Communications	Monitoring for Compliance, Effectiveness and Status	Schedule & Experts
Archaeo-logical sites	As defined by GOA and communities for legacy values such as burial sites, sacred ceremonial sites. **Risk** Inadvertent damage to historical values	The Government of Alberta requires that all activities that may cause a surface disturbance on the land have a Heritage Resource Review completed prior to development. Al-Pac and NFPL are legally obligated to ensure that such resources are protected within their operations. Each community may define their own traditional use in different ways than that expressed by the provincial government To protect archeological resources, those resources must first be identified and located. The Historic Resources Management Branch controls a database containing a listing of Heritage Resource Values. This database is populated with historic sites that appear as a generalized legal land description. This data is publicly accessible and the list is not comprehensive. Protection measures are determined with the cooperation and consultation of communities. The Al-Pac & NFPL Layout Standards and Guidelines Manual provides for Harvest Block Deletions for archaeological sites. Al-Pac acquires the services of archaeological consultants to complete Historical Resources Reviews and impact assessments for forest harvest planning. The impact assessments include field testing to identify heritage resource sites so they can be avoided.	Communities are contacted regularly, as described above in Indigenous values management. Field crews are trained to assess, document and report on all features they may come upon in the field. Once sites are removed from harvest plans, compliance monitoring via FOMs is only necessary to ensure block boundaries are followed. GOA surveillance provides another level of assurance	Identification during development of blocks. Ongoing monitoring not required once identified, after removal from harvest Compliance monitoring is ongoing. Community reps as requested For more information, contact Kiera Stewart-Shepherd
Clearwater and Christina Rivers	Portions of these rivers designated by the Canadian Heritage Rivers System **Risk** Effects on water quality due to operations in the rivers' watershed areas	Risks from forestry are generally low; the designated portion of each river is outside of the FMA area, but upstream river reaches or portions of the rivers' watershed do lie within the FMA area. Riparian buffers outlined in the OGRs and stream-crossing protocols are the principal management strategies to prevent negative effects on water quality, e.g. through sedimentation.	Compliance around riparian buffers and stream crossings is conducted internally through field operational monitoring (FOMs) and verified by GOA.	Compliance monitoring is ongoing. For more information, contact Tina Langille-Hayward

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Appendices

Appendix 1. Alberta Forest Management Planning System Overview

Excerpt from the **Alberta timber harvest planning and operating ground rules**:

Forest management has both a planning and operational component, each with their own products. Once operational plans have been approved, timber operations can commence and be monitored.

Strategic planning

Forest management plans

FMPs are a requirement of a FMA. They represent the highest level of operational planning (strategic) undertaken by a timber disposition holder. The FMP demonstrates the commitment of the Forest Management Agreement holder to the practices and principles of sustainable forest management (SFM), to the degree in which that FMA holder has control. The FMP focuses on the forest management activities of the FMA holder and embedded timber disposition that achieves and integrates the environmental, social, economic and cultural values across the defined forest area (DFA). The key outputs of the FMP are:

- the spatial harvest sequence (SHS) which identifies the areas to be harvested by decade for the next 20 years;
- the sustainable harvest level (annual allowable cut) at which Values, Objectives, Indicators and Targets (VOITS) are met and;
- the reforestation strategy table which identifies the post-harvest treatments.

Adherence to the approved SHS and reforestation strategy table is imperative to achieving the predicted future forest as set out in the FMP. The future forest condition, while dependent on many factors, is strongly influenced by harvest patterns, intensity and schedules.

Compartment assessment

A compartment assessment (CA) may be required when:

- information or major issues are identified that in the Department's opinion, have not been addressed in the FMP;
- the SHS is deemed by the Department to be inappropriate due to a significant change in the circumstances since the approval of the FMP; or
- the timber disposition holder identifies a shift in a management intent or potential variance outside of acceptable tolerances. The timber disposition holder may request to submit a CA for review to inform operational planning.

Operational planning

The operational planning process consists of the general development plans (GDPs), annual operating plans (AOPs) and the reforestation program, with each plan outlining the methods in the implementation of the approved FMP.

General Development Plan

The GDP is a component of the Annual Operating Plan and provides a comprehensive description of a forest disposition holder's proposed harvest operations (Standard and/or Non-Standard schedule),

and road building. The GDP guides integration with other timber disposition holders and defines where forestry operations will occur to assist in communication to the public, interested parties and Indigenous consultation. The primary components of a GDP are the spatially delineated SHS (including a spatial submission) that clearly show and document the assessed harvest areas, access roads, associated watercourse and waterbody crossings, and variance from the SHS for up to the next five years.

Annual operating plan

The AOP provides a comprehensive description and operating schedule of a timber disposition holder's proposed activities for the current or upcoming year. The operating schedule is a subset of the activities in the approved GDP.

Reforestation Program

Although the reforestation program is a component of the AOP, it is treated as a separate submission and approved separately. The reforestation program describes proposed silviculture activities in alignment with the approved FMP and GDP. The reforestation program contains a silviculture treatment schedule detailing planned silviculture activities for the upcoming season.

Appendix 2. List of adjacent and non-adjacent protected areas near the Al-Pac FMA.

Name	Province	Type	Status	IU
Athabasca Dunes Ecological Reserve	Alberta	Ecological Reserve	Legally Designated	Ia
Cold Lake Provincial Park	Alberta	Provincial Park	Legally Designated	II
Garner Orchid Fen Natural Area	Alberta	Natural Area	Legally Designated	III
Harper Creek Natural Area	Alberta	Natural Area	Legally Designated	III
Lesser Slave Lake Provincial Park	Alberta	Provincial Park	Legally Designated	II
Long Lake Provincial Park	Alberta	Provincial Park	Legally Designated	II
Marguerite River Wildland Provincial Park	Alberta	Wildland Provincial Park	Legally Designated	Ib
Meanook National Wildlife Area	Alberta	National Wildlife Area	Gazetted	IV
Moose Lake Provincial Park	Alberta	Provincial Park	Legally Designated	II
Richardson Lake Bird Sanctuary	Alberta	Migratory Bird Sanctuary	Gazetted	Ib
Richardson Wildland Provincial Park	Alberta	Wildland Provincial Park	Legally Designated	Ia
Spruce Island Lake Natural Area	Alberta	Natural Area	Legally Designated	II
Tawatinaw Natural Area	Alberta	Natural Area	Legally Designated	II
Upper Mann Lake Natural Area	Alberta	Natural Area	Legally Designated	II
White Earth Valley Natural Area	Alberta	Natural Area	Legally Designated	II
Wood Buffalo National Park Of Canada	Alberta	National Park	Legally Designated	Ib
Backes Island	Sask.	Wildlife Refuge	Permanent	IV
Bazill	Sask.	Wildlife Refuge	Permanent	IV
Beacon Hill	Sask.	Provincial Pasture	Legally Designated	V
Beatty Lake Recreation Site	Sask.	Recreation Site	Permanent	V
Beaupre Creek Recreation Site	Sask.	Recreation Site	Permanent	V
Beaver/Cowan Rivers Recreation Site	Sask.	Recreation Site	Permanent	V
Bluebell	Sask.	Provincial Pasture	Legally Designated	V
Bronson Forest Recreation Site	Sask.	Recreation Site	Permanent	V
Budd Lake	Sask.	Repres. Area Ecol. Res.	Permanent	Ib
Bug Lake Recreation Site	Sask.	Recreation Site	Permanent	V
Cabana	Sask.	Provincial Pasture	Legally Designated	V
Canoe Lake (Cole Bay) Recreation Site	Sask.	Recreation Site	Permanent	V
Caribou Flats	Sask.	Repres. Area Ecol. Res.	Permanent	Ib
Chitek Lake Recreation Site	Sask.	Recreation Site	Permanent	V
Cowan Dam Recreation Site	Sask.	Recreation Site	Permanent	V
Dore Lake Recreation Site	Sask.	Recreation Site	Permanent	V
Fairholme	Sask.	Provincial Pasture	Legally Designated	V
Fish And Wildlife Development Fund	Sask.	Fish and Wildl. Dev. Fund Land	Permanent	V

Name	Province	Type	Status	IUCN	Area km^2	Adjacent to FMA area
Fort Black	Sask.	Protected Area	Permanent	III	0.0	No
Fowler Lake Recreation Site	Sask.	Recreation Site	Permanent	V	0.7	No
Gatehouse Island	Sask.	Wildlife Refuge	Permanent	IV	0.0	No
Hackett Lake Recreation Site	Sask.	Recreation Site	Permanent	V	0.6	No
Halfway House Recreation Site	Sask.	Recreation Site	Permanent	V	0.6	No
Helene Lake Recreation Site	Sask.	Recreation Site	Permanent	V	0.2	No
Lac La Plonge Recreation Site	Sask.	Recreation Site	Permanent	V	1.2	No
Little Amyot Lake Recreation Site	Sask.	Recreation Site	Permanent	V	0.4	No
Makwa	Sask.	Provincial Pasture	Legally Designated	VI	48.9	No
Makwa Lake Provincial Park	Sask.	Natural Environ. Park	Permanent	II	25.3	No
Mccusker River	Sask.	Ecological Reserve	Permanent	Ia	1394.3	No
Meadow Lake Provincial Park	Sask.	Natural Environ. Park	Permanent	II	1688.1	No
Nesset Lake Recreation Site	Sask.	Recreation Site	Permanent	V	5.3	No
Pagan Lake Recreation Site	Sask.	Recreation Site	Permanent	V	0.8	No
Pine Woods Recreation Site	Sask.	Recreation Site	Permanent	V	0.6	No
Primrose Lake	Sask.	Wildlife Refuge	Permanent	Ia	117.5	No
Primrose Lake Provincial Ecol. Reserve	Sask.	Ecological Reserve	Permanent	Ia	195.0	No
Prince Albert National Park Of Canada	Sask.	National Park	Legally Designated	II	3954.9	No
Private Conservation Lands	Sask.	Private Cons. Lands	Private Cons. Lands	IV	131.8	No
Rock Island	Sask.	Wildlife Refuge	Permanent	IV	0.0	No
Saint Cyr Hills Trails Recreation Site	Sask.	Recreation Site	Permanent	V	4.5	No
Selenite Point	Sask.	Repres. Area Ecol. Res.	Permanent	Ib	37.6	No
Shell Lake Recreation Site	Sask.	Recreation Site	Permanent	V	0.4	No
Shirley Lake Recreation Site	Sask.	Recreation Site	Permanent	V	0.4	No
Smoothstone Lake Recreation Site	Sask.	Recreation Site	Permanent	V	0.1	No
St. Walburg	Sask.	Provincial Pasture	Legally Designated	VI	40.7	No
Steele Narrows Provincial Park	Sask.	Historic Park	Permanent	III	0.8	No
Taylor Lake Recreation Site	Sask.	Recreation Site	Permanent	V	0.4	No
Turtle Lake Recreation Site	Sask.	Recreation Site	Permanent	V	1.1	No
Waterhen River Recreation Site	Sask.	Recreation Site	Permanent	V	0.1	No
Wildlife Habitat Protection	Sask.	Wildlife Habitat Prot.	Permanent	V	1093.7	No

Appendix 3. Assessment Team

Al Pac HCV Project Team - Short biographies

Tina Langille-Hayward
Tina is a Registered Professional Forest Technician in the province of Alberta. Her educational background is in renewable resource management and business. She has been employed with Al-Pac since 2006 in a variety of roles, such as Public Affairs Specialist, Poplar Farm Land Lease Coordinator, Consultation Coordinator and, since 2017, as the FSC Certification Specialist. Past employment experience includes time as an Environmental Assessment Warden with Parks Canada and as a Resource Technician with the British Columbia Ministry of Forests.

Tom Habib
Tom Habib holds a BSc in Ecology, University of Guelph (2006), an MSc in Ecology, University of Alberta (2010) and has a background in wildlife and landscape ecology and management, and over a decade of experience working at the interface of science and policy on wildlife and land-use management issues in Alberta. He has previously worked on assessing cumulative effects on biodiversity, developing plans for recovering caribou populations, and assessing ecosystem services. As an ecologist at Al-Pac, Tom works with planners and operations staff, as well as colleagues from other resource industries, academia, environmental non-governmental organizations, Indigenous Peoples, and government on sustainably managing the forest for multiple values.

Kiera Stewart-Shepherd
Kiera is a Registered Professional Forester (RPF) in the province of Alberta. She holds a Bachelor of Science in Forestry from the University of Alberta. She has been working with Al-Pac since 2021 in the Indigenous Relations department. Previously, she worked in the consulting industry where she specialized as a forest planner and supporting clients in Indigenous consultation. She is a member of White Bear First Nation which is in Treaty 4.

Tom Clark
Tom is a consulting ecologist working on wildlife ecology and forest management. Much of his time is spent on forest values, using the High Conservation Values approach of the Forest Stewardship Council. He prepares assessment HCV reports and helps with preparation for audits. This work is informed by his experience as a forest auditor. He is on audit teams using the Independent Forest Audit (IFA) process in Ontario, and with Forest Stewardship Council (FSC) certification process in the U.S. and Canada. Tom has a strong public forest policy background. For 19 years he was a member of the Ontario Deputy Minister's (MNRF) advisory group called the Provincial Forest Policy Committee.

Kris McCleary
Kris is a management consultant working on helping organizations function more effectively. She has a bachelor's degree in Resource Conservation, Master's Degree in Forestry and a Master's Certificate in Project Management and holds the Project Management Professional (PMP) designation. With over 20 years experience in the natural resource sector, she has the skills and expertise to guide forestry companies in projects to conserve environmental values.

Appendix 4. Peer review of the HCV report (as required by the FSC standard).

Review of Assessment for the license forest area of the Alberta Pacific Forest Management Agreement Area

The following forms[20] are based on the Peer Review procedure from the HCV Resource Network. They have been modified by CMC to fit into a form, but otherwise follow all of the requirements[21]. For questions contact Tom Clark (705 645 2580 tom@tomclark.ca). Note these forms are accompanied by a covering letter providing summary findings of the review.

Findings in this review are assessed as either major, minor, not applicable (N/A), or as suggestions.

- Major findings mean that a key component of the assessment is missing or incorrectly assessed. This will have a potential impact on an actual value. It needs to be corrected immediately before the report is approved.
- Minor findings affect the clarity or usefulness of the assessment. It would be unlikely to have a real impact on the value itself, but may cause planning difficulties.
- Suggestions relate mainly to clarity and possible fixes to problems in the report itself or other sources of information.
- Not applicable means that for some reason that section of the peer review did not apply to the report being reviewed.

Each section of the report may have multiple findings that are either major, minor or suggestions. The findings are the opinion of the peer reviewer and are not binding on the Company, however, the findings need to be addressed in order for the peer review to be considered as evidence in an audit.

NOTE: Company response highlighted in BOLD text below

[20] Forms updated Aug 2020.
[21] This review process is the sole responsibility of Tom Clark. The use of HCV RN procedures does not imply their participation or oversight.

Part 1

1. Executive summary of the document

In this section the review evaluates:
a) Are the key findings clearly presented and summarized?
b) Does the summary accurately reflect the findings and recommendations of the main document?

Findings:

(a) Yes, the findings are outlined and summarized in an understandable manner.

(b) The Executive Summary (including Table 1) provides a clear and accurate overview of the content of the main body of the report. Cross-referencing throughout the report facilitated the linkage of related concepts and discussions.

Issues: None ☒ Minor ☐ Major ☐ N/A ☐ Suggestion ☐

2. Scope of the assessment

In this section the review evaluates:
a) Is the assessment area and surrounding landscape clearly defined?
b) Is there a basic summary of the company and its operations in the area?
c) Are the impact and scale of proposed operations adequately described?

Findings:

(a) Yes, a description of the assessment area and surrounding landscape is summarized in the section titled “The Al-Pac FMA Forest Description” and includes a map situating the FMA within the province.

(b) Yes, a summary of the operational structure is included in section “The Al-Pac FMA Forest Description” as well as in the “High Conservation Value – Executive Summary”. The report information is concise and clear.

(c) Yes. The scale of the proposed operations is discussed in a few locations in the report, namely, the Overview of HCV Assessment, the Al-Pac FMA Forest Description, and the 2018 Operating Ground Rules.

Issues: None ☒ Minor ☐ Major ☐ N/A ☐ Suggestion ☐

3. Wider landscape context and significance of the assessed area

In this section the review evaluates:
a) Is the wider landscape convincingly and adequately described?
b) Are the key social and biological features of the wider landscape clearly described?

Findings:

(a) A discussion of the wider landscape is presented through the characterizations of provincial and regional boreal forests and watersheds. Linkages are also made regarding the importance of viable national ecosystems to minimize risk for ecological elements such as species at risk. In addition, a discussion of the boreal landscape processes in

general and within the Al-Pac FMA specifically are included throughout the report, such as in the discussion in element 4.

(b) The discussion of key social and biological features of the wider landscape is detailed. The importance of the FMA area as an element of a larger network of critical habitat areas for importance species is clearly presented in the discussion of Category 1 and outlined in Table 6.

Valuable information on the importance of the landscape for residents and tourists is clear and helpful. This report would benefit from explicitly recognizing Aboriginal rights and the embedded values of Indigenous peoples to the landscape, including the Al-Pac FMA.

Al-Pac response: Statement recognizing Indigenous rights and the embedded values of Indigenous peoples to the landscape, including the Al-Pac FMA has been added to the report.

Issues: None ☐ Minor ☒ Major ☐ N/A ☐ Suggestion ☐
Include recognition of Aboriginal and Treaty rights and the embedded ecological values of Indigenous peoples to the landscape, including the Al-Pac FMA.

4. HCV assessment process including consultation processes

4.1 Composition and qualifications of the assessment team

In this section the review evaluates:

a) Was there adequate access to relevant expertise to assess biological and social values?

Findings:

Yes. Provincial guidelines, manuals and legislation that guide sustainable forest management are clearly referenced and identified. Local and provincial experts were consulted and the engagement with Indigenous communities was clearly outlined. The report provided helpful bios that outlined the expertise of the assessment team, company and government staff.

Issues: None ☒ Minor ☐ Major ☐ N/A ☐ Suggestion ☐

4.2. Data sources and data collection methodologies

In this section the review evaluates:

a) Are data sources and data collection methodologies clearly described or referenced and summarized (and presented in annexes if appropriate), and are they adequate to identify HCVs?

b) Were reasonable efforts made to fill gaps in the data, proportionate to the impact and scale of the operations?

Findings:

(a) Yes. The data sources and collection methods were thorough, clearly described and follow sound research protocols. Appropriate references were included and discussed as needed providing helpful information to determine assessment methodology and rationale. Each element was reviewed and described, and the identification of HCV's was clear. Live links were quite helpful in reviewing the supporting information.

(b) Yes. A section entitled *Keeping HCVs up to date - Process* is included and articulates that the HCVs and their management strategies will be reviewed annually. It is also stated that Al-Pac is open to changes on an ongoing basis is support of their adaptive management approach that will take into consideration the information found in research and monitoring.

Monitoring HCVs and ongoing efforts to fills in gaps provide a terrific opportunity for collaboration between biologists and Indigenous monitors. It is suggested that Al-Pac commit to explore the possibility of community-based monitoring to further support Indigenous engagement and maintaining Indigenous knowledge.

Al-Pac response: This is an idea that Al-Pac has considered, but hasn't yet found an effective and workable solution to implement. Al-Pac will remain open to exploring this idea further.

Issues: None ☐ Minor ☐ Major ☐ N/A ☐ Suggestion ☒
Al-Pac explore the possibility of community-based monitoring to further support Indigenous engagement and maintaining Indigenous knowledge.

4.3. Consultation processes

In this section the review evaluates consultation for identification, management and monitoring:

a. Were relevant stakeholders appropriately consulted?

b. Is this documented in a verifiable manner?

c. Were their views or the information they provided incorporated into the relevant process?

Findings:

(a) Clarify why the Fort McKay Métis Nation is not listed in Table 13 *Indigenous communities within or with traditional lands within the Al-Pac FMA area*.

(b) Yes. Links to 1) Indigenous community websites within the Al-Pac FMA area, 2) municipalities in the area of the FMA and a map of the FMA are provided allowing for verification of sources and information.

(c) Information through consultation appears to be included. For example, Table 15 and associated discussion provides management information for important economic and cultural waterbodies in the FMA area. It would be helpful if additional specific examples of Indigenous knowledge, community input and feedback was provided.

Al-Pac response: Our approach has been to engage with communities that have shown an interest in forest management issues and to also start with the Metis Nation of Alberta regions for Metis engagement. For Region 1, we worked with Cheryl Gordon, who is their consultation coordinator. When we asked which locals might be interested in participating, it was shared that representation between the local and the region was being worked out. Al-Pac has engaged the Ft McKay local in other areas including consultation and community investment, and will be engaging them on other fronts as they become more well established.

Specific examples of inclusion of views and the resultant adaptation of Al-Pac planning that occurred as a result of engagement and consultation are often confidential and site-specific in nature. Al-Pac attempted to add clarity around common examples of site specific HCVs and strategies that may be used to maintain or enhance those HCVs.

Issues: None ☐ Minor ☒ Major ☐ N/A ☐ Suggestion ☐
- Clarify why the Fort McKay Métis Nation is not listed in Table 13
- Provide additional specific examples of inclusion of views and/or adaptation of Al-Pac planning that occurred as a result of engagement and consultation.

5. Identification, location and status of each HCV

5.1. Addressing all six HCVs

In this section the review evaluates how the report assesses the individual 19 elements

Findings:

Cat 1 (A) Element 1:

Adequate. The assessment of this element is thorough and well researched. A list of species at risk (SAR) is maintained and annually updated by Al-Pac. A review of the potential habitat of species at risk is included in Table 6. It is to be applauded that this report included the International Union for the Conservation of Nature (IUCN) species rankings to provide a global context for SAR as well as the designation of "possible HCV" for transparency and to increase awareness of values.

Element 2:

The rationale for element 2 states "while endemism is sometimes misunderstood…". It may be more effective to follow up with the implications of misunderstanding this concept. You may also consider moving this statement to the Assessment Results section that includes additional context for endemism in the Canadian boreal forest.

Al-Pac response: The report has been updated to clearly identify the implications of misunderstandings around the concept of endemism, and the statement has been moved to the Assessment Results section.

Element 3:

Adequate. Assessment methodology for this element included a review of various provincial, national and global environmental sources as well as engagement with Al-Pac's Landscape Advisory Group, stakeholders and Al-Pac staff. This section includes a discussion of a discussion of critical species habitat
a map of bird areas as well as a map of bird colonies and staging areas in the FMA area (Figure 3).

- Minor comment (p.37): There is an extra period in the sentence "The Al-Pac area does not fall within the distribution…"
- Minor comment (p.37): There appears to be a missing "an" in the sentence "It is not HCV."

Al-Pac response: The report has been updated to remove the period and add an "an" to the sentence "It is not HCV".

Element 4:

The report contains clear linkages to multiple locations in the report with related and/or supporting information. The discussion and rationale regarding the regionally significant species are well detailed.

- Minor request. It is encouraging to see that the report stated, "If stakeholders have identified the species as significant, Al-Pac will do an HCV assessment (p.37)." Would it be possible to identify any species that underwent an HCV assessment as a result of stakeholder feedback?

- Minor request. The report states that "stakeholders' experiences, staff expertise, and Indigenous traditional knowledge were considered (p.37)." How was this information considered? What did consideration look like?

- Minor request: Using specific examples, clarify how the input from Indigenous engagement regarding regionally significant species was included in the assessment.

Al-Pac response: The report has been updated to clearly identify the species that were identified by stakeholders, staff and Indigenous People and that were assessed. Information was added on how input from stakeholders, staff and Indigenous Peoples was considered.

Element 5:

Adequate. Assessment clear and complete.

Element 6:

Adequate. Assessment clear and complete.

Cat 2 (B) - Element 7

The assessment is clear and well discussed.

- Minor comment. What is the process by which Al-Pac will include and/or consider ongoing agreed upon resolutions in relation to on how "forestry modelled on wildfire aligns with the natural disturbance regime of the fire-prone boreal forest (p. 49)? Stated another way, how does Al-Pac's staff engage with these important discussions of natural forest fire processes and adapt Al-Pac's management planning accordingly?

Al-Pac response: The report has been updated to clearly identify the process by which Al-Pac engages in important discussions on natural fire processes and how Al-Pac adapts its planning accordingly.

Cat 3 (C) - Element 8:

Adequate. Assessment clear and complete.

Element 9:

Adequate. Assessment clear and complete.

Element 10:

- Minor comment. According to the report, “this assessment will be reviewed in the near future when there is more clarity around the requirements of the IFL standard (p. 54)”. What is the approximate timeframe when this issue will be revisited? Annually? Or?

Al-Pac response: The report has been updated with a statement about Al-Pac’s commitment to monitoring FSC developments on IFL requirements on an ongoing basis.

Element 11:

Adequate. Assessment clear and complete.

Cat 4 (D) - Element 12:

- Minor comment. The assessment methodology for this element includes “known usage of water by local communities.” How were known usage of water by local communities identified? Was this

  information verified? If so, how? Is this referring to locations or water sources types?

Al-Pac response: The report has been updated to clarify that no concerns came forward from communities related to forestry impacts on drinking water sources through consultation or engagement processes.

Element 13:

Adequate. Assessment clear and complete.

Element 14:

Adequate. Assessment clear and complete

Element 15:

Adequate. Assessment clear and complete

- Minor comment. What do the asterisks refer to in the Rationale section? Please clarify.

Al-Pac response: The report has been updated to remove the asterisks.

Element 16:

Adequate. Assessment clear and complete

Cat 5 (E) Element 17:

- Minor comment. Please clarify why the Fort McKay Métis Nation is not in Table 13.

- Minor comment. The population numbers for Athabasca County and the Municipal District of Opportunity are missing. Please address.

Al-Pac response: The report has been updated with population numbers for Athabasca County and the Municipal District of Opportunity. See response in 4.3 Consultation Processes for an explanation on engagement of Fort McKay Métis Nation.

Cat 6 (F) Element 18:

- This section provides a detailed summary of engagement with regional Indigenous and non-Indigenous communities. Privacy protocols are in place and no propriety information is shared in this report.

- Suggestion: Al-Pac may wish to consider exploring the Cultural Keystone Places concept in ongoing engagement with local and regional communities on forest areas considered critical for cultural identity (Cuerrier, A, N Turner, T Gomes, A Garibaldi and A Downing. 2015. Journal of Ethnobiology 35(3): 427-448).

Al-Pac response: We appreciate the suggestion and will consider it to see how it fits within the FSC and Al-Pac systems in the future.

Element 19:

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Adequate. Assessment clear.

Issues: None ☐ Minor ☒ Major ☐ N/A ☐ Suggestion ☒
- See comments under each element in the above review. - Suggestion: Al-Pac may wish to consider exploring the Cultural Keystone Places concept in ongoing engagement with local and regional communities on forest areas considered critical for cultural identity.

5.2. Data quality

In this section the review evaluates:

a. Whether data is detailed, recent and complete enough to make informed decisions on HCVs.
b. Is the precautionary principle appropriately invoked in the use of data?

Findings:

(a) Yes. The data in the review is thorough, detailed and references multiple recent sources to inform the determination of HCVs.

(b) Yes. The precautionary principle is defined and invoked throughout the report particularly in the discussion of effectiveness monitoring.

Issues: None ☒ Minor ☐ Major ☐ N/A ☐ Suggestion ☐

5.3. Reference to HCV toolkits

Findings:

The HCV toolkit is referenced in the assessment methodology pertaining to critical habitat for regionally significant species and used to provide guidance when contemplating regionally specific species decline as a result of forest management.

Issues: None ☒ Minor ☐ Major ☐ N/A ☐ Suggestion ☐

5.4. Decision on HCV status

In this section the review evaluates whether the HCV decisions are clear

Findings:

Yes. The text is clear and well-structured as it pertains to HCV decisions.

Issues:	None ☒	Minor ☐	Major ☐	N/A ☐	Suggestion ☐

5.5. Mapping decisions

In this section the review evaluates how the report provides maps of HCVs, including the protection of maps for values that are confidential.

Findings:

Yes. The maps are well referenced, providing a clear display of information. Numerous references are made to the protection of confidential information and it does not appear that any confidential information was shared.

Issues:	None ☒	Minor ☐	Major ☐	N/A ☐	Suggestion ☐

6. Management of HCVs

6.1. Assessment of threats or risks to each HCV within the landscape context

In this section the review evaluates how the report assesses threats or risks from current or planned management activities to each HCV within the assessment area identified.

Findings:

A risk assessment was completed for each HCV evaluation. It was sufficient in scope and discussed threats due to management activities.

Issues:	None ☒	Minor ☐	Major ☐	N/A ☐	Suggestion ☐

6.2. Do proposed management plans adequately maintain or enhance HCVs?

Issues:	None ☐	Minor ☐	Major ☐	N/A ☒	Suggestion ☐

6.3. Protection of HCVs from land use conversion

Issues:	None ☐	Minor ☐	Major ☐	N/A ☒	Suggestion ☐

7. Monitoring of HCVs

7.1. Are monitoring plans clearly described?

In this section the review evaluates whether methodologies are clearly described and appropriate to meet stated objectives?

Findings:

Yes. Monitoring plans for designated HCVs are outlined in the Table 1 along with links for additional monitoring details.

- Table 1: Management and monitoring cells for HCV element 12 are blank. N/A could be added for consistency.

- Table 1: Element 17 has the designation HCV? What does the "?" refer to? Please clarify.

Al-Pac response: The management and monitoring cells for HCV Element 12 have been populated, and the designation status for Element 17 has been updated.

Issues: None ☐ Minor ☒ Major ☐ N/A ☐ Suggestion ☐
Minor suggestions listed above would help clarify report details.

7.2. Are monitoring plans adequate?

In this section the review evaluates whether monitoring plan adequately deal with significant changes arising from management operations or likely external threats/risks to HCVs

Findings:

Yes. Monitoring plans are described in Table 1. Supporting control documents that provide detailed operational information are referenced including references to the FMP.

Issues: None ☒ Minor ☐ Major ☐ N/A ☐ Suggestion ☐

7.3. Are plans for a regular review of data built in to the management and monitoring plan

In this section the review evaluates how the report will be updated in future.

Findings:

Yes. HVCs and their associated management strategies are to be reviewed annually as part of the monitoring process. This approach is detailed in the section "Keeping HCVs Up to Date – Process."

Issues: None ☒ Minor ☐ Major ☐ N/A ☐ Suggestion ☐

8. Responsible management of other conservation values

8.1. Conversion of non-HCV ecosystems

Issues: None ☐ Minor ☐ Major ☐ N/A ☒ Suggestion ☐

8.2. Responsible management of other conservation Values

Issues: None ☐ Minor ☐ Major ☐ N/A ☒ Suggestion ☐

Disclaimer:
"This review was conducted by Ann Garibaldi in good faith on the basis of information provided by the authors, CMC Ecological Consulting and Kris McCleary Consulting. Ann Garibaldi can take no responsibility for the accuracy of information provided and cannot be held liable in any way for any damage or loss resulting from the use or interpretation of this review by the Company or any third party."

Appendix 5. Intentionally blank