Alberta-Pacific Forest Industries Inc.
Forest Management Agreement Area

Forest Stewardship Report Overview
Reporting Period 2006 - 2010
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List of Acronyms

AAC – Annual Allowable Cut
AAM – Active Adaptive Management
ABMI – Alberta Biodiversity Monitoring Institute
ACC – Alberta Caribou Council
AESRD – Alberta Environment and Sustainable Resource Development
APSI – Alpac Pulp Sales Inc.
ASR – Alternative Regeneration Standards
AVI – Alberta Vegetation Inventory
BCC – Boreal Caribou Committee
CIR – Colour Infrared Photography
CTP – Conifer Timber Permit
DFMP – Detailed Forest Management Plan
EFM – Enhanced Forest Management
FMA – Forest Management Agreement
FMP – Forest Management Plan
FMFT – Forest Management Task Force
FMU – Forest Management Unit
FSC – Forest Stewardship Council
ILM – Integrated Land Management
LAG – Landscape Advisory Group
LARP – Lower Athabasca Regional Plan
LiDAR – Light Detecting and Ranging
LUF – Land Use Framework
MOSA – Mineable Oil Sands Area
MOU – Memorandum of Understanding
MTU – Miscellaneous Timber Use
NDM – Natural Disturbance Model
NRV – Natural Range of Variation
OGR – Operating Ground Rules
PAR – Progressive Aboriginal Relations
PIR – Partners in Injury Prevention
R & D – Research and Development
RSA – Regeneration Standards of Alberta
SHS – Spatial Harvest Sequence
TDA – Timber Damage Assessment
TSA – Timber Supply Analysis
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Alberta rose
I: Setting the Scene

About this Report

This Stewardship Report documents progress towards the goals and objectives described in the 2006 Forest Management Plan (FMP) for the Alberta-Pacific Forest Products Ltd. (Al-Pac) Forest Management Agreement (FMA) area. The report specifically covers the years 2006 to 2010, or approximately half way through the 10-year life span of the FMP.

A first, general Stewardship Report was published in 2002 describing progress towards goals and objectives to 2000 – as described in Al-Pac’s Detailed Forest Management Plan (DFMP) approved in 2000 and preceding interim forest management plans from the beginning of operations in 1993 under Al-Pac’s FMA. In addition, Al-Pac has also published sustainability, community and social responsibility reports on its corporate performance since 2004. These reports are available from the company and on the www.alpac.ca website.

The Stewardship Report is meant to satisfy both the regulatory requirements of Alberta Environment and Sustainable Resource Development (AESRD) and the need for accountability and transparency with stakeholders. As a result, we have endeavoured to make the contents accessible by anyone who is interested, whether they want to see general trends or to track a technical issue in detail.

Challenges of Report Preparation

The format and content for the preparation of the Alberta Pacific Forest Products Inc. Forest Management Agreement Area Forest Stewardship Report (Reporting Period 2006 – 2010) was left for Al-Pac to define. The lead authors of the report saw this as an opportunity to re-imagine how the report might be prepared to meet the regulatory requirements of Alberta Environment and Sustainable Resource Development (AESRD) while at the same time be an accessible and informative engagement document for interested people who may only have a passing knowledge and understanding of the technical aspects of forest management. The document was also prepared to reflect the interests and requirements of Al-Pac’s ongoing Forest Stewardship Council (FSC) Certification.

Seeking the Best Advice Possible

Al-Pac realized that advice from people who knew the company well and had the ability to provide constructive advice and criticism on Al-Pac’s forest management performance would be critical to producing a consistent, credible and usable document for the range of intended audiences.

To ensure success three important steps were taken:

1. Bob Bott, a technical writer familiar with the forest industry generally and Al-Pac specifically, was engaged to support the development of the report’s content and consistency through his expert understanding of the industry, editorial and document sequencing skills.

2. A two-tiered format was prepared:
   a. General overview report for a larger audience; and,
   b. Detailed technical report on the 29 objectives.

3. Recruitment of five members of the company’s Landscape Advisory Committee (LAG) who had among them:
   a. Direct experience in the preparation of the company’s 2006 detailed forest management plan;
   b. A demonstrated understanding of forest management and ecosystem function;
c. An appreciation for the regulatory requirements of AESRD as well as the need to communicate with audiences who would be interested in reviewing the report from a non-technical perspective, and most importantly; and,
d. Provided a range of unique perspectives on the issues.

Report Preparation Process

The group comprised of five members of the LAG, Dave Cheyne from Al-Pac, Bob Bott and a professional facilitator to support the process. The group met 10 times between January 2011 and April 2012 to provide detailed comments on the 29 objectives in the company’s FMP and the strategies that supported them.

The editorial group provided detailed comments on the merits of the objectives, individual strategies and identified indicators. While most objectives and strategies have, in the view of the group, met the requirements outlined in the forest management plan it was acknowledged that since 2006 the regulatory, landscape and forest management planning conditions had, in some cases, changed. They also noted that some of the objectives and strategies were ambitious and, although the best of intentions were driving them, not possible for Al-Pac to accomplish. Where those changed or difficult situations appear to exist, the group provided its commentary with the hopes of assisting both Al-Pac and AESRD in developing the next FMP.

The Stewardship Report represents a formal, regulatory accounting of Al-Pac’s legacy, particularly the 2006-2010 period and the role the LAG has played. This is the first time the LAG has had an opportunity to participate in a process to report on its legacy of advice.

While the process for preparing the document relied on advice from the editorial group, whose contribution is gratefully acknowledged, the content and accuracy of the Stewardship Report is wholly the responsibility of Al-Pac and the company’s representatives.

Presentation of the Stewardship Report

The Stewardship Report is presented in two parts. The General Report summarizes progress by topic, while the Technical Report addresses the 29 FMP objectives in detail, in the order they appear in the FMP. The complete 2006 FMP can be viewed at:


The General Report is intended for all stakeholders and general readers. The Technical Report is addressed to more specialized readers and those interested in specific topics; it is available on the Al-Pac website www.alpac.ca or in a print copy by request from Al-Pac Public Affairs at 1-800-661-5210. The Technical Report deals with the 29 objectives and the associated strategies. The Technical Report is prepared in a “report card” format for each objective.

The General Report is based on detailed information from the Technical Report and in other supporting documentation.

The FMP deals with forestry throughout the FMA area (refer to Map 1), including some activities of other forest companies in addition to Al-Pac. Other companies are principally the nine quota holders that have conifer timber rights in the FMA area, although there is also activity under the Commercial Timber Permit and Miscellaneous Timber Use programs of AESRD. When available, relevant information on quota holder activities is included in this report when we refer to “the forest companies.”

Additional quota holder information can be found in the Technical Report.
Quota Holders in the FMA Area

1. Alberta-Plywood Ltd. – Slave Lake
2. Ed Bobocel Lumber (1993) Ltd. – Lac La Biche
3. Ghost Lake Timber Lake Inc. – Smith (acquired by Ed Bobocel in 2010)
4. Millar Western Forest Products Ltd. – Boyle
5. Northland Forest Products Ltd. – Fort McMurray
6. S-11 Logging Company Ltd. – Trout Lake
7. Spruceland Millworks Ltd. – Fort Assiniboine
8. St. Jean Lumber Ltd. – Wandering River
9. Vanderwell Contractors – Slave Lake

About Al-Pac

Al-Pac operates the largest single-line pulp mill in North America. Approximately 1,100 team members and contractors use environmentally sustainable practices to produce upwards of 650,000 tonnes of high quality, elemental-chlorine-free bleached kraft pulp annually. Al-Pac has a business office in Edmonton and the mill is located about 50 kilometres northeast of Athabasca, Alberta, or 200 kilometres northeast of Edmonton.

Al-Pac is jointly owned by Japan-based Mitsubishi Corporation (70 per cent) and Oji Paper Co. Ltd. (30 per cent). The company’s pulp products are used around the world in the manufacture of writing and printing grade papers, commercial printing papers, glossy photograph and specialty papers, corrugated paper products and hygienic tissue papers. Alpac Pulp Sales Inc. (APSI) is based in Vancouver, British Columbia, and markets pulp produced by Al-Pac.
About the FMA area

In 2011, Al-Pac renewed its FMA with the Alberta government. Under the agreement, the company is licensed to sustainably harvest trees in an area of 6.8 million hectares in northeastern Alberta. About 2 million hectares of the FMA area are harvestable forest, while about 4.8 million hectares are comprised of wetlands (bogs, fens and muskeg), non-commercial black spruce stands and non-harvestable forest areas (river valleys, slopes, protected areas and riparian buffers).

The FMA area is a boreal mixedwood forest, containing deciduous (leafy, hardwood) tree species and coniferous (cone-bearing, softwood) species. Al-Pac primarily utilizes deciduous trees: trembling aspen and balsam poplar, plus small amounts of birch and other species. Quota holders and other forest companies that operate in the FMA area utilize conifer species such as white spruce and jack pine, and provide conifer chips to Al-Pac. In total, from 1993 to 2011, Al-Pac and other forest companies harvested about 250,000 hectares, equivalent to about six per cent of the commercially productive forest or two per cent of the total FMA area. Forest companies are required to reforest harvested areas within one to two years after cutting.

In addition to its own harvests, Al-Pac is responsible for all forest management in the FMA area, including inventories and planning. All forest companies must comply with laws, policies and regulations of the Alberta government and the terms of the FMA. Although AESRD is the principal regulator, forest activities are also affected by policies and regulations of many other federal, provincial and municipal governments and agencies.
For communities in and around the FMA area, forest resources are important in providing employment through the forest industry and activities such as trapping, guiding, hunting, tourism and fishing. The southern part of the FMA area lies within a three-hour drive from major population centres around Edmonton. Several lakeside summer villages are established along the southern edge of the FMA.

Lakeland Park and Recreation Area and Cold Lake Air Weapons Range are also on the southeastern edge of the FMA. Lakeland Park and Recreation Area offers tourism and recreation opportunities. Cold Lake Air Weapons Range includes a military base that provides economic benefits to the area; the large training area may contribute to protected-area ecological values because of its very restricted use.

Although the FMA area landscape encompasses almost seven million hectares, the majority of the area is comprised of wetlands and non-harvestable, or non-productive forest, areas such as river valleys, water bodies, slopes, protected areas, parks, riparian buffers and black spruce bogs. Fire is the predominant natural disturbance on the landscape. More than 500,000 hectares have been burned within the last 10 years. Insects and disease also affect forest composition. The oil and gas sector is the largest non-forestry industrial activity on the landscape. Roads and utilities also have significant impact. About two million hectares are commercially productive forest area. Chart 1 illustrates the FMA area gross landbase metrics.
When the original Al-Pac FMA was signed in 1991, there were only two operating oil sands mines and a small number of pilot in-situ oil sands projects. Since then, oil sands production has grown five-fold, and more projects are under development. Chart 2 illustrates this growth trend. Also refer to:


The population of Fort McMurray, the largest community within the FMA boundary, grew from 35,000 in 1991 to 77,000 in 2010.
The FMA Area Stakeholders

The FMA area is currently divided into 12 Forest Management Units (FMUs) (Note: 11 FMUs for the period 2006-2010). FMU S14 was added in 2011 with the signing of the new FMA. Map 2 illustrates the 2006-2010 FMUs and quota holder influence.

In addition to Al-Pac, eight quota holders and various Miscellaneous Timber Users (MTU) also have timber rights within the area. The MTU program is maintained by the government of Alberta.

Map 2: Al-Pac FMUs

Most of the FMA area is intended to be managed for multiple uses and ecological sustainability. This requires integrating the interests of many varied stakeholders, including government, industry, Aboriginal, traditional and recreational (refer to Figure 1 – Transformational Forest Planning). The interactions among these stakeholders contribute to a complex management mosaic.
Table 1 identifies other resource users and influencers in the FMA area. The other resource users and influencers are, but may not be limited to:

Table 1: FMA Area Resource Users and Influencers

<table>
<thead>
<tr>
<th>FMA Area Resource Users and Influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
</tr>
<tr>
<td>Alberta</td>
</tr>
<tr>
<td>Aboriginal Relations</td>
</tr>
<tr>
<td>Culture</td>
</tr>
<tr>
<td>Energy</td>
</tr>
<tr>
<td>AESRD</td>
</tr>
<tr>
<td>Infrastructure</td>
</tr>
<tr>
<td>Tourism, Parks and Recreation</td>
</tr>
<tr>
<td>Transportation</td>
</tr>
<tr>
<td>Canada</td>
</tr>
<tr>
<td>Fisheries and Oceans Canada</td>
</tr>
<tr>
<td>Natural Resources Canada</td>
</tr>
<tr>
<td>Municipal</td>
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<tr>
<td>Four counties</td>
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<tr>
<td>Forestry</td>
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<tr>
<td>Al-Pac</td>
</tr>
<tr>
<td>Quota holders</td>
</tr>
<tr>
<td>Miscellaneous Timber Permit users</td>
</tr>
<tr>
<td>Energy</td>
</tr>
<tr>
<td>Oils sands mining</td>
</tr>
<tr>
<td>In-situ oil sands</td>
</tr>
<tr>
<td>Natural gas</td>
</tr>
<tr>
<td>Conventional oil</td>
</tr>
<tr>
<td>Seismic programs</td>
</tr>
<tr>
<td>Pipelines</td>
</tr>
<tr>
<td>Utilities corridors</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Hunting</td>
</tr>
<tr>
<td>Trapping</td>
</tr>
<tr>
<td>Fishing</td>
</tr>
<tr>
<td>Camping</td>
</tr>
<tr>
<td>Outfitters and lodge owners</td>
</tr>
<tr>
<td>Naturalists</td>
</tr>
<tr>
<td>Recreation (quads, snowmobiles, cross-country skiing, etc.)</td>
</tr>
<tr>
<td>Aboriginal Peoples</td>
</tr>
<tr>
<td>First Nations</td>
</tr>
<tr>
<td>Metis Nation of Alberta</td>
</tr>
<tr>
<td>Metis Settlements</td>
</tr>
</tbody>
</table>

![Figure 1: Transformational Forest Planning](image)
Transformational Forest Planning
(TRIAD + Energy Sector)

Forest Management Planning & Consultation

Government of Alberta

Land-Use Planning Process (LUF)

Forest Company Planning Units

Industrial Salvage Fibre to

Al-Pac & QHs

Sustainable Forest Management

Protected Areas

Poplar Farms

Intensive Forest Management

All-Weather Roads
ILM Plans
(Energy Sector “LOC”)

Transformational Management
About the Landscape Advisory Group

The LAG, and its predecessor the Forest Management Task Force (FMTF), have provided input to Al-Pac forest management planning since 1992, a year before mill operations began. The LAG was established in 2007 as a forum that brings together forest companies, Aboriginal people, government officials and land users (hunting and fishing, trapping, conservation and naturalist interests, and public members) to discuss needs, interests and issues affecting the forest landscape and provide advice to address them.

Until 2006, Al-Pac had considerable latitude in forest management planning and operating ground rules (OGRs), as long as essential government requirements were met. From 1992 to 2006, the FMTF played an active role in drafting plans and ground rules. In 2006, AESRD published a new Planning Manual with generic OGRs. This prescriptive approach defined the scope for stakeholder groups and forest companies to innovate and customize their forest management plans and operational practices.

In addition, in 2005, Al-Pac opted to certify its sustainable management practices through the FSC. As part of the certification, FSC required that Al-Pac demonstrate the extent and inclusiveness of its stakeholder, community and public engagement and Aboriginal consultation.

To better address the changes in government direction and the requirements for FSC certification, new terms of reference were developed and adopted along with a new name (refer to Appendix I of this Stewardship Report).

A subcommittee of LAG actively participated in the development of the Stewardship Report. They reviewed drafts, suggested revisions, and advised on content and presentation.

Definitions

We define a goal as a broad, general statement that describes a desired state or condition related to one or more forest values. An objective is a clear, specific statement of expected results to be achieved within a defined period of time related to one or more goals. Strategies are means employed to reach the objective.
To measure progress, the FMP suggested potential criteria or indicators; these are benchmarks or means from which to measure progress towards a given objective. For example, the number and amount of fines imposed might be an indicator of regulatory compliance. Where proposed criteria proved impractical, alternative indicators may have been selected to measure progress. Ideally, indicators should reflect outcomes (i.e., actual effects on people, resources or ecosystems). For each objective, the Technical Report contains a discussion of progress and, where applicable, the data to indicate progress.
II: Overview: Highlights of Performance

Forest management is considered sustainable when it ensures that all of the economic, environmental and social values of the landscape are maintained or enhanced, today and over the long term.

An important principle in working towards sustainability in forest management is the adoption of active adaptive management (AAM), which involves researching, testing, adjusting and applying changes to forest practices as new information is gathered.

The following is a summary of progress at the mid-point in implementation of the 2006 Al-Pac FMP, which is due for renewal in 2016. This summary is based on the Technical Report’s detailed account of progress on the goals and objectives set out in the FMP, documents and reports cited below, perceptions of foresters and stakeholders, and views of the LAG.

Environmental Sustainability

The key objectives identified by Al-Pac in working towards environmental sustainability of the FMA area are:

- Maintaining biological diversity;
- Protecting species-at-risk;
- Maintaining the distribution of coniferous, deciduous and mixedwood stands;
- Reforestation;
- Avoiding impacts on groundwater and surface water resources; and,
- Designing harvest patterns to approximate natural disturbances.

Maintaining biological diversity on the landscape is a central goal of sustainable forest management. Al-Pac has maintained that large, ecologically representative areas should be protected from industrial activity so they can serve as benchmarks for comparison with the ecosystems of other, managed parts of the FMA area. It has been difficult to gain government and stakeholder agreement for such designations; this matter is now addressed through the Land-Use Framework (LUF) and the Alberta Land Stewardship Act (2000).

An alternative means of assessing biodiversity has emerged through the sampling methods of the Alberta Biodiversity Monitoring Institute (ABMI). The institute’s reports on the FMA area indicate that habitat and species are largely intact despite recent high levels of industrial activity. Integrated Land Management (ILM) agreements among forest users also reduce the ecological footprint (the cumulative effects of forestry and energy sector activities) compared to what might otherwise occur without integrated planning.

Among species at risk, woodland caribou have been identified as a particular concern in the FMA area. Al-Pac has taken steps to avoid impacts on caribou and their habitat, and the company participates in regional and provincial initiatives to protect the species. Al-Pac continues to work with the Alberta government, the energy industry and other stakeholders to address the caribou issue. The Alberta Woodland Caribou Recovery Team, which included an Al-Pac representative, proposed a province-wide caribou recovery strategy that was endorsed by the provincial government in 2005. At that time, the Alberta Caribou Committee (ACC) was created as an advisory body to the provincial government. Al-Pac has representatives on the committee, which seeks ways to integrate industry operations and caribou conservation. The company has developed the Al-Pac Caribou Strategy and served as a technical advisor on the Athabasca Landscape Team of the ACC. Recommendations for caribou conservation in northeastern Alberta were submitted by the ACC to the Alberta government in July 2009. In 2011, the government issued A Woodland Caribou Policy for Alberta, which stated:

Efforts will be undertaken to stabilize, recover and sustain woodland caribou populations in Alberta. Actions will be undertaken to address caribou habitat needs, including achievement of these requirements in land use planning and approvals. Areas within caribou ranges will be identified and established where caribou conservation is the highest land management priority and other activities/uses minimized....
Several steps have been taken to maintain the diversity of mixedwood sites containing both deciduous and coniferous species. Traditional forestry practices would return harvested sites to either all-conifer or all-deciduous stands. Al-Pac has partially addressed this issue through understory protection (avoiding damage to young conifer while harvesting mature poplar in mixedwood stands) and supported research on mixedwood management. The Alberta government’s adoption of new regeneration standards (RSA) in 2010 has directed forest companies to ensure reforestation of mixedwood sites.

Successful reforestation of harvested sites is a requirement – legally, environmentally and economically. This is being achieved on nearly all harvest sites, but soil compaction has inhibited the natural regeneration of aspen (through suckering) on roads, landings and some areas logged in summer during wet conditions. The sites are now being decompacted and planted with conifer seedlings or balsam poplar. Research is continuing on the best methods to reforest compacted sites, and this work is also relevant to reclamation of energy sites.

The majority of harvest and hauling activities occur when the ground is frozen, which minimizes effects on both soil and water resources. Al-Pac has supported considerable research on hydrology in the FMA area. Operational changes have included more frequent culvert inspections and use of portable bridges that avoid disturbance of stream flows.

Fire is the principal natural disturbance in the FMA area, and it has also been a focus of research. One major change in forest operations over the past decade has been a move to much larger single-entry harvest areas to approximate the patterns of natural disturbance. Historically, there have been many small fires and a few large ones across the landscape, with the large ones accounting for most of the total hectares burned. As a result, cutblock size has been made more variable and now includes blocks of up to 500 hectares – although the average cutblock size 2006 to 2010 is 23.5 hectares.

Retention of trees as structure in cutblocks has also been altered due to natural disturbance research. Initially, many single trees were retained, but research has shown that it is more effective to retain clumps of trees.

When surveys of harvest areas showed that Al-Pac’s target of five per cent average structure retention was not being met, new training was instituted for harvest contractors, and monitoring of structure retention was increased. In some instances, retention areas are now selected in advance and flagged.
Economic and Social Sustainability

The following is an overview of some of the factors affecting the economic and social sustainability of forest operations in Al-Pac’s FMA area.

Since the late 1990s, the economy of the FMA area has been growing rapidly due to expansion of the oil sands industry. This has created economic benefits for many people living in northeastern Alberta; it has also created challenges for forest management and forest companies. In addition, conifer operations have been severely affected by the rising value of the Canadian dollar, falling prices, decreased demand for lumber and panelboard, effects of the U.S.-Canada softwood lumber agreement, and high operating costs in northeastern Alberta. Some of these factors also affected Al-Pac, especially during the deep recession of 2008 to 2009 when worldwide pulp markets declined, though less severely than the lumber and panelboard operations.

Forest clearing for oil sands expansion (mines, in-situ developments, plants, roads, wells, pipelines, seismic cutlines, power lines, camps, housing etc.) creates short-term fibre supply for the forest companies, but removes significant forested areas from the landscape. Under the LUF and the Alberta Land Stewardship Act, additional areas of forest may be protected for social or environmental reasons. Over the next 20 to 60 years, conifer operations may face reduced timber supply in any case due to the need to maintain all age classes across the landscape. Al-Pac may face increased transportation costs as harvests occur increasingly in parts of the FMA area that are more distant from the mill. For Al-Pac, however, reduced FMA timber supply and longer haul distance could be partially offset by the poplar plantations the company has established on private land outside the FMA area.

ILM agreements between Al-Pac and energy companies reduce the costs and maximize the benefits from industrial activity in and near the FMA area. Benefits include short-term fibre supply for the forest companies, reducing loss of productive forest, and avoiding duplication of road construction. Sales of roads and landscape data to energy companies have also produced revenues for Al-Pac. The company has supported research and development on reclamation of industrially disturbed sites so that they can be returned to productive forest as rapidly and effectively as possible after activity ceases.
Fibre-trading arrangements among forest companies ensure that maximum value is obtained from each cubic metre harvested. ILM agreements also provide fibre for forest companies from energy sector activities (refer to Figure 13).

Al-Pac makes substantial contributions to the economic and social wellbeing of the area within 100-kilometre radius of the mill. This is where most team members and contractors live, where most goods and services are purchased, and where company contributions and volunteerism are concentrated. The other forest companies have smaller, though significant, socio-economic impacts in their areas.

Elsewhere in the FMA area, forest operations and transportation have some socio-economic effects; but, they are difficult to discern because the energy sector is at least 10 times larger than forestry in northeastern Alberta, whether measured by employment, investment or revenues. Al-Pac research indicates that the energy sector is the dominant socio-economic factor in most of the FMA area.

Al-Pac is now working with other industries, the County of Athabasca, and the towns of Boyle and Athabasca on the Alberta Energy Corridor. This project aims to encourage new development such as manufacturing or fabrication that can take advantage of the county’s strategic location between the Edmonton-Fort Saskatchewan area and Fort McMurray. The area’s assets include Al-Pac’s “green” electrical power generation and the Al-Pac plant’s steam and water treatment facilities.
Al-Pac is thoroughly integrated into the social fabric of northeastern Alberta and in Athabasca County, where the mill is located and 77 per cent of team members reside. Another 15 per cent of team members reside in adjacent Lac La Biche County to the east. Al-Pac purchases more than $100 million in Alberta goods and services annually, mainly in the nearby region. The county taxes paid by Al-Pac from 1993 to 2009 totaled nearly $69 million. The company’s direct community investment, also focused in the region, averages about $1 million annually. Between 2006 and 2010, Al-Pac invested more than $11 million in scientific research and development, of which more than $4 million directly related to environmental science or forestry.

“Social license” is essential for any activity involving public lands and resources. Government approval constitutes one form of social license, whether for forestry and energy sector operations, hunting and fishing, trapping, or recreational uses. That approval is generally based on public engagement, stakeholder involvement and Aboriginal consultation, and a judgment that the activity is in the public interest. (One definition of public interest is that Albertans are better off with the activity than without it.) As part of its approval for forest management, the government also requires certain forms of stakeholder engagement, including forums such as the LAG, community meetings, and dissemination of public information such as the company’s forestry plans.

Beyond government requirements, Al-Pac undertakes a variety of initiatives to validate and enhance social sustainability of forest management. Al-Pac’s sustainable forest management certification by the FSC recognizes the company’s community and Aboriginal commitments and consultation, as well as environmental performance. Other forest companies in the area receive public input by participating in the LAG and consulting with people directly affected by their operations.

Al-Pac demonstrates its commitment to Aboriginal communities through ongoing consultation, employment, economic development and education partnerships that provide lasting benefits. In 2007 the company adopted an Aboriginal Relations Strategy that focuses on four key areas: economic development; employment and training; education and consultation; and traditional use of land, forests, wildlife and cultural sites. Since 2006, Al-Pac has been awarded a Gold Level certification in Progressive Aboriginal Relations (PAR), a national initiative that recognizes commitment to increasing Aboriginal employment, assisting in business development, building individual capacity and enhancing community relations. Al-Pac is in compliance with Alberta’s First Nations Consultation Guidelines on Land Management and Resource Development.
Integrating Values

Sustainability and the public interest are often difficult to determine because many costs and benefits cannot be measured in dollars and cents. Moreover, there may be conflicts and trade-offs among economic, environmental and social objectives, so they need to be weighed and judged together as well as individually. If there are negative effects, are they temporary or permanent? Are there alternative approaches or ways to reduce impacts?

Summer harvesting provides an example of how values are integrated.

The majority of Al-Pac’s logging and trucking activities occur when the ground is frozen. This minimizes disturbance that can affect soils and watersheds. Winter operations reduce soil compaction that prevents natural regeneration of aspen and balsam poplar. However, about one-third of the harvest takes place during the frost-free months for a number of social and economic reasons. Year-round operations maintain the flow of timber to the mill, make efficient use of roads and equipment, and provide economic security for contractors. As a result, some compaction and disturbance inevitably occurs, and Al-Pac continues to develop ways to reduce and remediate the effects.

The challenges of compaction were highlighted after heavy rain occurred in 2005 during summer harvest in one area (township 68-10-4) south of Conklin, Alberta. Subsequent surveys showed natural regeneration of aspen on parts of the site was very poor. Al-Pac initiated a remediation program to replant areas within the site with white spruce and balsam poplar, and the company continues to seek ways to avoid such situations in the future. The challenges were exacerbated when grasshoppers destroyed most of the white spruce seedlings after the initial replanting.

Two other examples of sustainability challenges are:

1. Rail haul: Shipping logs by rail from Fort McMurray, Alberta to the Al-Pac millsite appeared to be an excellent way to reduce traffic on Highway 63, reduce greenhouse emissions, and reduce costs of transportation. After Canadian National Railway took over the rail line, however, the service was discontinued and it has not been possible to negotiate a new haul agreement.
2. Access management: There are instances where biodiversity and other objectives could be met by blocking or limiting access. However, this is not practical in many parts of the FMA area due to relatively flat terrain, nor could closures be enforced effectively in such a large area. Because hunting and fishing are such a big part of Aboriginal and non-Aboriginal culture and lifestyle in the region, it would also be difficult to devise socially acceptable access control in much of the area.

Research and Development

Research is an integral part of Al-Pac’s approach to ecosystem-based management and environmental sustainability. It assists the company in operations and planning and contributes to the base of knowledge on boreal forest ecosystems while providing the scientific, professional and technical resources needed for sound forestry in the FMA area and the province as a whole. Al-Pac’s research activities have advanced the understanding of boreal ecology and provided credible direction for forest management.

Research and development projects are designed to support one or more of Al-Pac’s six key environmental goals for the FMA area:

1. The maintenance of biodiversity;
2. Conservation of species at risk;
3. Maintenance of the forest cover type distribution;
4. Reforestation of disturbed sites;
5. Conservation of water resources; and,
6. Utilization of a natural disturbance pattern approach for harvest design.

Experimental, conceptual and modeling approaches contribute to the development of decision support tools for use by forest companies and government. Research and monitoring results are interpreted and used to develop implementation guidelines for use by operational staff, such as those contained in Al-Pac’s Reclamation Handbook and the OGRs for forest management activities.

Al-Pac’s R & D activities have been designed to support progress towards achieving the various forest management objectives and, ultimately, environmental sustainability. These are illustrated by Figure 2: the Knowledge-Based Best Practices wheel.

Science, traditional knowledge, strategic partnerships and continuous improvement all come together to help form the nine key result areas of Al-Pac’s knowledge-based best practices illustrated in this diagram.

Al-Pac’s research activities provide direct and indirect benefits to the company and other forest companies operating in the FMA area. Direct benefits include:

- Better knowledge of forest systems and processes, enhanced understanding of the effects and effectiveness of management and mitigation strategies on the forest;
- The ability to “learn while doing,” implementing an AAM model to enhance harvest practices;
- Leveraging opportunities for funding projects and developing partnerships;
- Informed decision-making for changes to the FMA area OGRs;
- Informed decision-making and policy applications (e.g., identifying potential ecological benchmarks and reserve areas, participating in development of the Lower Athabasca Regional Plan (LARP), supporting and working with the NSERC Industrial Research Chair in Integrated Landscape Management at the University of Alberta);
- Building the professional, scientific and technical capacity of the region and province, which helps meet Al-Pac’s research needs and also helps to recruit and retain its own professional, scientific and technical team members and contractors;
- Enabling more efficient and sustainable operations; and,
- Avoiding potential future costs.

**Figure 2: Knowledge-Based Best Practices Wheel**

Indirect benefits include:
- “Social license” as research and monitoring address public concerns and contribute to provincial and community support for operations;
- Buy-in for ecological initiatives within the Al-Pac organization;
- Inclusion of projects based on local concerns (such as access issues and healthy moose populations) raised through the LAG, Aboriginal consultation and other public input; and,
- Projects and training designed to promote learning and capacity-building among community members.

Research is principally designed to assist with the development of planning and operational practices that assist the implementation of ecosystem-based management. This management approach is based on the natural disturbance model (NDM) and zonation strategies designed on a triad of protected, multi-use and intensively managed forest lands. There is a wide range of management intensities possible under a land use zonation approach, and there is no requirement that each management category be equally allocated across the management area. The NDM is central to Al-Pac’s approach to the conservation of biodiversity and sustainable forest management.

**Research Partnerships**

Al-Pac has been involved with many different research partnerships since the 1990s. Partners include academic institutions and the research community (University of Alberta, University of British Columbia, University of Calgary, University of Saskatchewan, Alberta Research Council, Alberta Innovates, etc.), the forestry and energy industries, forest-based communities, Aboriginal organizations, non-government organizations (Ducks Unlimited Canada) and governments at all levels. The partnerships have developed primarily through identification of similar issues or information requirements that need to be addressed.
Al-Pac has conducted or collaborated on many research and development initiatives in all areas represented in the R & D wheel since 1991, two years before mill operations began. Over the past 15 years, 1996 to 2010, Al-Pac has invested approximately $39 million in research in woodlands, environmental sciences and pulp-mill operations.

The company has collaborated with many partners during the development, implementation and knowledge transfer associated with research projects. Projects are designed to “learn while doing” and address current gaps in understanding, validate assumptions or hypotheses, or monitor responses to strategies and practices based on the AAM model described below. A summary of research partnerships is presented Table 2:

<table>
<thead>
<tr>
<th>Partnership Summary</th>
<th>Number of Organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universities</td>
<td>13</td>
</tr>
<tr>
<td>Forest Companies</td>
<td>9</td>
</tr>
<tr>
<td>Government Departments and Agencies</td>
<td>12</td>
</tr>
<tr>
<td>Consultants</td>
<td>6</td>
</tr>
<tr>
<td>Co-operatives and Industry Associations</td>
<td>10</td>
</tr>
<tr>
<td>Other Industries</td>
<td>7</td>
</tr>
<tr>
<td>First Nations within the FMA Area</td>
<td>2</td>
</tr>
</tbody>
</table>

**Active Adaptive Management**

Adaptive management is a “formal process for continually improving management policies and practices by learning from their outcomes” (Taylor et al. 1997). The term describes an interactive process designed to improve the rate of learning about the management of complex systems. The system under consideration in the Al-Pac FMA area includes the boreal forest ecosystem and associated terrestrial and aquatic components.

The adaptive management process is framed around the identification and acknowledgement of uncertainties and knowledge gaps about the response of a system to management actions. Learning through the use of management experiments and monitoring programs is a method to reduce these uncertainties through the evaluation of alternatives. These alternatives can include various management practices or combinations of them (scenarios) and the setting of different indicator targets within and between scenarios.

Trial-and-error approaches are a more passive form of adaptive management compared to AAM. AAM refers to a systematic process of modeling to predict management outcomes, experimentation and monitoring to compare alternative management outcomes. It is more efficient relative to trial-and-error approaches since it tests alternate practices simultaneously in management experiments rather than sequentially. Therefore, AAM is a risk management strategy based on continuous evaluation of the effects of forest management practices on ecological systems and processes.

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Boreal forest
A commitment to monitor the outcome of management practices is a requirement of AAM, and a comparison of multiple management alternatives is a key concept of AAM. Revision of practices is undertaken as new information becomes available. Communication between managers, scientists, government representatives and stakeholders is as important to the AAM process as analysis. Flexibility with the process, as well as in policy and planning, is essential to allow rapid implementation of new practices.

**Forest Management Planning**

During the first decade of operations in the FMA area, Al-Pac had wide latitude in developing management plans and OGRs specific to the FMA area, based on ecological principles and recommendations from stakeholders and the public. More recently a number of factors have affected planning options, including:

- Rapid expansion of the oil sands industry since 2000 resulted in large deletions from the FMA area for mining projects, significant intrusions into other areas for in-situ bitumen extraction projects and related pipelines, transmission lines and primary roads. In the short term, this creates a flow of timber from sites cleared for industrial development; but, over the longer term, it reduces the area available for ecologically based multi-use management.
- In 2006, AESRD published province-wide standards for forest management planning, OGRs, road construction, public consultation and other activities. While similar to many of Al-Pac’s progressive approaches, the standards alter the scope for innovation based on landscape-specific priorities and research, forest and landscape qualities, and stakeholder concerns.
- In 2008, after several years of consultation, the provincial government announced its LUF, a series of legislative and regulatory changes to establish new, coordinated regional land-use plans. The plans may, if necessary, override existing dispositions such as those for forestry and energy. Representatives of Al-Pac and Northland Forest Products Ltd. were actively involved in the Regional Advisory Council developing the LARP for a large portion of the FMA area. They provided forestry operators’ perspectives in the regional planning process.

**Forest Resources, Harvest Patterns and Fire – the Natural Disturbance Model**

Fire has been the main natural disturbance that has shaped Alberta’s boreal forests for 10,000 years. Plants, animals and ecosystems have adapted to forest fires that sweep 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 has patterned its forest harvesting strategies after this force of nature. The company has invested considerable research into fire ecology and how forest fires historically maintained biodiversity across the boreal forest landscape. The goal is to minimize the effects of Al-Pac’s harvesting operations and restore the ecological benefits of fire by approximating this natural disturbance as closely as possible.

This research has investigated a number of aspects of fire ecology including:

- Frequency - how often fire occurs on a given piece of land?
- Size - what range of fire sizes occur on different parts of the FMA?
- Intensity - how hot do the fires burn; 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 cutblocks and stand structure.

Al-Pac’s FMP illustrates the company’s commitment to operate within an ecosystem management or sustainable forest management framework. This includes approximating the stand structure retained after forest fires by leaving on average five per cent merchantable volume of trees standing in cutblocks.
In addition to work done at the stand or cutblock level, Al-Pac has initiated landscape level strategies to implement the NDM more effectively. Al-Pac's landscape level harvest approach is designed to maintain landscape patterns created by forest fires at large scales while ensuring a continued fibre supply. For example, traditional cutblocks are small and regular in shape. Al-Pac's harvest sites follow natural stand boundaries, are a variety of shapes and sizes, and leave a mix of different aged stands across the landscape. Imitating large forest fire patterns requires a mix of harvesting techniques and bigger disturbance sizes that differs from conventional two and three-pass harvest practices, which may cause fragmentation by reducing forest patch sizes.

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.

**Integrated Land Management and the Land-Use Framework**

In the late 1990s, as energy development began to accelerate in and near the FMA area, Al-Pac recognized that working cooperatively with energy companies could reduce impacts on the ecosystem, provide fibre supply for the mill and produce economic benefits for both parties. The first ILM agreements were reached in 2000, and the Integrated Land Services team was established in 2006 to maximize the benefits from ILM. The Alberta government has now adopted the ILM approach as a key component of its LUF.

One result of co-operation has been the adoption of narrow seismic cutlines in the FMA area. The standard cutline today is a trail of mulched brush, less than three metres wide, compared to previous bulldozed corridors six to eight metres wide. From 2000 to 2009, this practice avoided clearing about 200,000 hectares of forest in the Al-Pac FMA area.

Another major benefit has come from jointly planning roads, reducing the amount of road building by up to 30 per cent. The resulting roads and bridges are often built to higher standards. Al-Pac's detailed knowledge of the
landscape (mapping its vegetation, soils, hydrology, etc.) has become another valuable asset. Providing this data to energy companies helps them make better informed decisions about sites and access.

Al-Pac has joined energy companies to support research at the University of Alberta to improve the reclamation and reforestation of abandoned well sites. The company also supported research demonstrating that building exploratory wells on ice pads could greatly improve the success of later reforestation. Al-Pac strongly supports efforts to monitor and address the cumulative effects of all activities on the landscape through support of the University of Alberta’s ILM research chair.

Energy sector infrastructure in FMU L11

**Land Use and Biodiversity**

A fundamental test of sustainable forest management is whether the ecosystem continues to support all species, from fungi and insects to large mammals. Al-Pac maintains biological diversity primarily by making sure that the distribution of ages and types of forest stays within the natural range of variability (NRV), thus providing habitat for plants and animals. Due to the effects of wildfire, however, the ranges of variability are quite wide in the boreal forest.

Much of Al-Pac’s research has focused on monitoring and improving an approach to forest management based on habitat, which is sometimes referred to as the coarse-filter approach. Al-Pac has maintained that an important means to verify the effectiveness of management in the FMA area is to set aside ecological benchmarks – large and representative portions of land where there would be no harvest or industrial development. Such benchmarks would be used to compare processes in undisturbed forests with those in similar forests under management so that divergences could be studied and addressed. Al-Pac identified potential benchmark areas and gathered considerable support from stakeholders. However, this initiative was superseded by the adoption of the Alberta Land Stewardship Act, which led to the creation of the LARP. The LARP includes provisions for protected areas within the FMA area that could serve as benchmarks, including one potential benchmark area (Gipsy-Gordon Wildland Provincial Park) that had been identified through Al-Pac’s earlier initiatives.

Protected areas, with minimal human disturbance, are one component of the triad management philosophy espoused by Al-Pac and the Alberta government in the 1990s. The other two components in this three-pronged
approach are ecologically based, multiple-use forest management (as practised by Al-Pac in the FMA area) and intensive tree farming like Al-Pac’s poplar plantations in the agricultural White Area.

Currently, there are about 50,000 hectares of legislated protected areas in the FMA area, and Al-Pac has deferred its harvests in about 200,000 hectares of ecologically representative landscape (although some conifer harvest by quota holders may occur there). In 2011, the Alberta government through the LUF proposed a further ~230,000 hectares of protected area southeast of Fort McMurray – Gysey-Gordon lakes area.

The ABMI, an initiative strongly supported by Al-Pac since its inception, represents another important way to measure biodiversity, human impacts and the effectiveness of management. ABMI surveys on a 20-kilometre grid pattern to measure the status of more than 2,000 species and habitat types.

The first ABMI survey of the Al-Pac FMA area in 2009 found that the human footprint affected about seven per cent of the landscape: four per cent by forestry, two per cent by energy development, and one per cent by transportation infrastructure. Species were judged 93 per cent intact compared to reference conditions and habitats were 97 per cent intact. Future surveys will be broadened to include status and trends reporting for lichens, mosses, soil arthropods and wetland invertebrates. Over time, the ABMI results will provide important guidance for Al-Pac’s management and practices.

The ABMI Preliminary Report on the Al-Pac FMA area can be found at: http://www.abmi.ca/abmi/reports/reports.jsp?categoryId=163

Al-Pac also supports research and monitoring specific to animals and habitat types of concern. For example, woodland caribou, listed as a threatened species in Alberta, has been a particular concern because of declining population trends. Al-Pac participates in various initiatives whose goals are to conserve caribou while maintaining resource development. Research to date indicates caribou are affected by a complex interaction of predator-prey relationships, including northward movement of deer, in addition to human activities and possibly climate change.

**Water Resources**

Al-Pac’s FMA area includes many small and seasonal streams, some large rivers, and extensive bogs, fens, muskegs and other wetlands. The forest companies do not harvest near waterways, in black spruce bogs or other water-dominated sites. However, road development and adjacent harvesting may indirectly have a longer-term effect on these areas.

Al-Pac has invested in a number of major research projects to understand how water moves at or near the surface in the boreal forest and how this movement may be influenced by forestry (harvesting or road building). The goal
is to minimize impacts and ensure compliance with provincial and federal regulations regarding water and fisheries. Al-Pac continues to improve standards and practices for the placement, construction and maintenance of roads, bridges and culverts.
III: Meeting Expectations

This section is a report card on how the forest companies have met the expectations in the FMP. In many areas, the companies get a "passing grade" because the objectives have been met as planned; these satisfactory performances are discussed in detail in the Technical Report, and there is no need to elaborate here. Instead, we discuss only those objectives that have not been fulfilled satisfactorily and strategies that have not been implemented as intended. The unattributed judgments in the discussion are a composite of input from Al-Pac, other forest companies and the LAG. Where there are multiple viewpoints, the source is identified.

There are a number of instances where, although the objectives and strategies have been fulfilled as described in the FMP, concerns or questions have arisen that LAG members would like to see addressed during the remainder of this FMP or considered in preparing the next FMP. These are highlighted in the “Other concerns” section following the report card.

Objectives or Strategies not Completed as Described

Here are the objectives and strategies that were not carried out as described in the FMP:

**FMP Chapter 3 – Objective 2:** Upgrade the Alberta Vegetation Inventory (AVI) and continue to provide sound data for planning.

<table>
<thead>
<tr>
<th>FMP Page 77</th>
<th>Strategy</th>
<th>Indicator</th>
<th>Report Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2.2</td>
<td>Continue to utilize existing leaf-off colour-infrared (CIR) photography to enhance the identification of conifer understorey and crown components in mixedwood stands and map to AVI standards.</td>
<td>One township was flown in 2007 to provide new 1:10,000 CIR photos for a case-study on current understory interpretation techniques.</td>
<td>Trial completed – not sufficient change observed to justify continuing</td>
</tr>
<tr>
<td>3.2.9</td>
<td>Monitor regeneration success on roads, decking and processing areas.</td>
<td>Program dropped as per AERSD instructions (2007). Now included in RSA surveys of all forest company cutblocks.</td>
<td>Incomplete – Part of Objective 7 and 17</td>
</tr>
</tbody>
</table>

The requirements of the objective have been met, but technology continues to advance and enhancements are possible for the next FMP. The main concern is whether or not the inventory should be further enhanced through the use of leaf-off CIR photography. This supplies the forest companies with additional information on the forest canopy and the potential of the understory to contribute to the next forest. Light Detection and Ranging (LiDAR), a relatively new remote sensing tool, is another alternative that could be explored.

Regeneration on roads, decking and processing areas remains a concern for Al-Pac and the LAG, and is a focus for research and trials to improve success.

LAG Commentary

Technology continues to advance and enhancements are possible for the next FMP. The main concern is whether or not the inventory should be further enhanced through the use of leaf-off low elevation colour photography. This supplies the forest companies with additional information on the forest canopy and the potential of the understory assisting in the next forest. LiDAR, a relatively new remote sensing tool, is another alternative that could be explored. Regeneration on roads, decking and processing areas remains a concern for Al-Pac and the LAG, and is a focus for research and trials to improve success.
**FMP Chapter 3 – Objective 5:** To develop an efficient road network for log deliveries throughout the FMA area that minimizes the amount, distribution and duration of the roading footprint, and to mitigate the effects of roads on fish and wildlife and sustaining ecosystem functions.

<table>
<thead>
<tr>
<th>FMP Page 89</th>
<th>Strategy</th>
<th>Indicator</th>
<th>Report Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5.9</td>
<td>Utilize signs to notify the public of the status of Al-Pac’s temporary access roads.</td>
<td>Number of signs in the FMA area</td>
<td>Incomplete – signs do not delineate temporary status</td>
</tr>
</tbody>
</table>

**LAG Commentary**

The intent of Strategy 3.5.9 was to ensure that temporary roads would not become “traditional access” and, thus, remain open indefinitely. This requirement, posting the temporary nature of the roads, was not included in the OGRs and has not been accomplished. LAG members urge Al-Pac to reconsider their practice and comply with Strategy 3.5.9.

**FMP Chapter 3 – Objective 6:** To ensure that human development, use and management of roads take into account the safety of all users (industrial, recreational, Aboriginal) and mitigates the potential negative environmental effects associated with access.

<table>
<thead>
<tr>
<th>FMP Page 92</th>
<th>Strategy</th>
<th>Indicator</th>
<th>Report Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.6.3</td>
<td>The forest companies working with AESRD may investigate the feasibility of the establishment of “no hunting zone” corridors (possibly 0.4 kilometres on each side of the centre) on all new permanent roads for three years following construction. After this period, the need for the no hunting corridors would be reviewed in consultation with local community groups within the scope of an overall wildlife management strategy. Trapping activities would not be affected.</td>
<td>No Hunting Zone program in effect</td>
<td>Incomplete – not feasible</td>
</tr>
</tbody>
</table>

Al-Pac did a minor investigation of a No Hunting Zone program on corridors surrounding their permanent roads. The strategy is not feasible. Hunting regulations, access management related to hunting, and enforcement is a provincial mandate. Al-Pac would co-operate with AESRD if a project were initiated, but cannot implement or enforce a No Hunting Zone program in the FMA area.

**LAG Commentary**

The safety component of the objective is achievable by Al-Pac. It is being accomplished through signage, the OGRs, road monitoring, and education of users of access in the FMA area through forest planning meetings. However, mitigation of negative environmental effects associated with access is impossible for a forest company in Alberta. This would require the complete cooperation of all users and industries, a coherent and finalized land-use plan, and a strong enforcement effort from the province.
**FMP Chapter 3 - Objective 8:** Protect species identified as “at risk” or as socially important and meet Alberta government guidelines and ground rules relevant to concerns over specific species.

<table>
<thead>
<tr>
<th>FMP Page 93</th>
<th>Strategy</th>
<th>Indicator</th>
<th>Report Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.8.1</td>
<td>Administer a furbearer monitoring program throughout the FMA area. Review the program every three years to determine future requirements of the program.</td>
<td>Number of trappers involved in the program</td>
<td>Incomplete – program terminated</td>
</tr>
</tbody>
</table>

Al-Pac no longer administers a furbearer monitoring program. The program was discontinued in 2006 when it was apparent that trapper success and selected species population trends were not management areas in the control of the forestry companies. These areas are the responsibility of AESRD. Currently, through Al-Pac’s woodlands trapper coordinator, the company communicates with all affected trappers in our planning units. Trapper notification is typically up to three years ahead of actual harvest and can result in a combination of shifting of block boundaries or special buffers around selected furbearer habitat or cabin locations. The previous program lacked sufficient rigour or consistency to yield useful data for either scientific or operational purposes.

**LAG Commentary**

While most of the strategies under this objective have technically been completed, they do little to fulfill the overall objective to protect socially important and at-risk species. Most of the strategies appear to be bureaucratic or theoretical, with little relation to what is actually happening in the ecosystem. For example, the caribou-related strategies may have been fulfilled as specified, but they can hardly be considered successful or complete if populations are declining.

Regarding the furbearer monitoring, our concern is the health of the furbearer populations rather than the specific monitoring program. Assurances are needed that the combination of trapper consultations and the ABMI will provide sufficient information about furbearers. The LAG believes that a more rigorous furbearer program is required because of the importance of trapping within the FMA area. Al-Pac needs to revive a new program or assist ABMI in designing monitoring protocols suited to furbearer species.

Because of the high public interest, more information is needed about moose in the FMA area. The intensive research conducted in the 1990s¹, and any research in the past 10 years, needs to be summarized and analyzed in the context of social importance of the species to stakeholders and resource users, and reported in a clear concise manner with areas of data deficiency and further study.

We agree with Al-Pac foresters and ecologists that the coarse-filter or landscape approach is the accepted technique for forest management. The fine-filter approach could be very useful to complement landscape approaches when dealing with species at risk and other taxonomic categories besides vertebrates. We believe that new approaches, such as the ABMI monitoring and the designation of true ecological benchmark areas, help to ensure that socially important and at-risk species are conserved. We urge continued cooperation on wildlife research and management with government agencies and academic, conservation, hunting and trapping organizations.

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In the case of two bird species, the models showed declining habitat supply, and this should be addressed in the next FMP. For another bird species, there was insufficient data to assess habitat; this should also be addressed.

**Pelicans** – FMA area

**FMP Chapter 3 - Objective 10**: Provide the opportunity to investigate/evaluate the feasibility of improving fibre supply through Intensive Conifer Forest Management (i.e. EFM²) in the FMA area.

<table>
<thead>
<tr>
<th>FMP Page 113</th>
<th>Strategy</th>
<th>Indicator</th>
<th>Report Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.10.1</td>
<td>A conifer quota holder will prepare a conceptual Intensive Conifer Forest Management case-study within the AESRD EFM technical protocols.</td>
<td>Plan prepared and approved by AESRD</td>
<td>Incomplete – no quota holder prepared an EFM plan</td>
</tr>
<tr>
<td>3.10.2</td>
<td>Develop expected yield curves and crop plans, yield verification protocols.</td>
<td>Plan prepared and approved by AESRD</td>
<td>N/A</td>
</tr>
<tr>
<td>3.10.3</td>
<td>Determine economics, magnitude and specifics of implementation.</td>
<td>Plan prepared and approved by AESRD</td>
<td>N/A</td>
</tr>
<tr>
<td>3.10.4</td>
<td>Develop a framework to rank/manage fibre objectives versus societal and ecological objectives.</td>
<td>Plan prepared and approved by AESRD</td>
<td>N/A</td>
</tr>
<tr>
<td>3.10.5</td>
<td>Delineate monitoring techniques.</td>
<td>Plan prepared and approved by AESRD</td>
<td>N/A</td>
</tr>
<tr>
<td>3.10.6</td>
<td>Prepare the EFM plan by year 10 of the FMP and present the results to all FMA area forest companies and AESRD.</td>
<td>Plan prepared and approved by AESRD</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Quota holders concluded that EFM was not economic in the FMA area, especially given the recent weak markets for softwood lumber and panelboard. EFM carries high risks due to the potential destruction of infrastructure and loss of investment given the frequency of fire in the boreal forest, as well as the amount of industrial activity in the FMA area.

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² EFM is the use of various techniques to increase growth and yield.
LAG Commentary

None

**FMP Chapter 3 - Objective 12:** Retain forest structure in harvested cutblocks in varying amounts across the FMA area landscape.

<table>
<thead>
<tr>
<th>FMP Page</th>
<th>Strategy</th>
<th>Indicator</th>
<th>Report Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>119</td>
<td>Al-Pac – in ten FMUs, an average of five per cent of the deciduous merchantable volume and five per cent of the merchantable conifer volume will be retained in cutblocks, in addition to unmerchantable structure (MOSA cutblocks in FMU A15 are excluded from this strategy).</td>
<td>Stand structure per cent per year</td>
<td>Incomplete – non-compliance with OGR 7.4.1</td>
</tr>
</tbody>
</table>

Al-Pac’s long-standing policy has been to retain an average of five per cent structure in harvest areas, but recent surveys revealed that the average retention had dropped to as low as three per cent based on a stand structure protocol (the protocol and monitoring program is articulated in the approved FMP). Based on Al-Pac’s stand structure monitoring, an average of 5.1 per cent merchantable volume was left on Al-Pac cutblocks from 2005 to 2010.

**Table 3: Average Retained Stand Structure**

<table>
<thead>
<tr>
<th>Year</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>3.1</td>
</tr>
<tr>
<td>2007</td>
<td>4.9</td>
</tr>
<tr>
<td>2008</td>
<td>4.4</td>
</tr>
<tr>
<td>2009</td>
<td>4.9</td>
</tr>
<tr>
<td>2010</td>
<td>8.1</td>
</tr>
</tbody>
</table>

Al-Pac had relied on harvest contractors to estimate how much structure they were leaving. To ensure the target is met, the company has implemented a review process with the operators as well as marking out larger retention patches prior to harvesting. Under current harvest practices, clumps and individual trees are left in the block to approximate the structure left after natural disturbance. Al-Pac monitors contractors to ensure compliance.

LAG Commentary

Al-Pac has adopted a number of strategies to address the issue of adequate stand structure retention. It should be noted that the strategies are all interdependent. The OGRs now capture this interdependence. This resulted in a sharp improvement in 2010, which offset the deficiencies in the earlier years.

**FMP Chapter 3 - Objective 16:** Continual integration of all forest management activities by quota holders, Al-Pac and the AESRD administered Conifer Timber Permit (CTP) program through the co-operative implementation of forest management strategies on the FMA area.

<table>
<thead>
<tr>
<th>FMP Page</th>
<th>Strategy</th>
<th>Indicator</th>
<th>Report Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>132</td>
<td>Explore the initiation of timber supply zone based silvicultural liability accounts and/or joint reforestation working groups.</td>
<td>Liability account</td>
<td>Requirement not met</td>
</tr>
</tbody>
</table>

This strategy would pool the forest companies’ silvicultural funds, but it has not been pursued. A formal joint silviculture committee of the forest companies has not evolved since the approval of the FMP. Al-Pac and the quota holders have differing silviculture management objectives and strategies. This is the consequence of a
conifer versus deciduous species bias for the landscape. This bias is primarily illustrated in the different means of vegetation management for conifer plantations – broad-scale use of herbicide by quota holders, versus limited spot-herbicide use and mechanical means (brush saws) by Al-Pac.

**LAG Commentary**

None

**FMP Chapter 4 - Objective 26**: Implement biodiversity, forest renewal, and forest monitoring systems to evaluate changes in landscape pattern, forest growth and yield, habitat structure and species diversity.

**LAG Commentary**

All of the strategies are being technically fulfilled except trapper monitoring (refer to Objective 8). A number of the strategies have limited applicability to forest management. We suggest the next FMP specify only monitoring programs with relevance for forest management. The bird monitoring program for example provides an important measure of biodiversity in the FMA area.

**FMP Chapter 4 - Objective 29**: Continue to develop a stewardship reporting program that provides stakeholders with a review of the forest companies’ forest management activities and performance on its forest management plan commitments.

**LAG Commentary**

The LAG questions whether an annual stewardship update (refer to Strategy 3.29.3) is needed. Al-Pac reports regularly to LAG meetings and through other means such as corporate social responsibility reports, in addition to the regulatory requirement for this formal stewardship report in the fifth year of the FMP.

Unmerchantable forest ecosystems in the FMA area
Objectives and Strategies Completed & LAG Commentary

FMP Chapter 1 - Objective 1: Continue community engagement initiatives (also referred to as public involvement) and consultative processes which involve stakeholders in the management planning process and encourage public input at all stages of planning.

LAG Commentary
Most of the strategies are being fulfilled, but it has been difficult to include LAG members in other public engagement activities such as community meetings. LAG members have also expressed concern that quota holders are not fully involved in the community engagement and consultative processes. While some quota holders participate regularly in LAG meetings, others rarely attend.

FMP Chapter 3 - Objective 3: Salvage suitable timber that can be utilized recognizing economic and ecological constraints.

LAG Commentary
The technical requirements of this objective are being met, but LAG members have several concerns:

- When salvage is purchase by Al-Pac from the agricultural White Zone (outside the FMA area), the land is typically used for agricultural purposes such as cattle grazing rather than being reforested. How does this affect biological diversity in Alberta? What is the effect on the “carbon budget” of the landscape? Is this included in Al-Pac’s carbon calculations? How does this salvage, along with Al-Pac’s poplar farms, affect agricultural incomes? Are there risks of agriculture moving into the Green Zone?
- How does industrial salvage in the FMA area affect biodiversity? What are the cumulative effects of fire salvage and industrial salvage, and how does salvage affect the future forest landscape? How will salvage affect the future annual allowable cut (AAC) for the forest companies?
- Although only about 25 per cent of the pre-burn fibre is harvested in fire salvage, the spatial distribution of the salvage is not well documented. The result is “fuzzy” maps that only show volume reductions. What are the real effects of fire salvage on the landscape and the future forest?

Al-Pac has undertaken to address these questions in presentations to the LAG in 2012. Research is underway to determine more accurately the effects of all forestry operations on the carbon budget.

FMP Chapter 3 - Objective 7: To utilize soils research in the FMA area to minimize in-block road and harvest equipment impacts to ensure vigorous post harvest regeneration.

LAG Commentary
The technical requirement has been met, but Al-Pac and the LAG have concerns about the effectiveness of the monitoring of roads and landings. These areas are still, and will continue to be, areas of potential reduced tree growth. Although roads and landings are incorporated in Alberta’s RSAs, LAG members ask whether a system should be installed that specifically monitors the growth and performance of trees on roads and landings.

To assist in addressing this concern, Al-Pac is working with a soil scientist on methods to ameliorate damage to forest soils and thus to improve regeneration. In addition to soil recovery plans, Al-Pac is exploring a new balsam poplar provenance program to develop a supply of suitable seedlings for regeneration of roads and landings. Al-Pac will continue to address the successful reclamation and reforestation of roads and landings, and will report on progress.
**FMP Chapter 3 - Objective 11**: Maintain forest cover patterns by designing and implementing landscape level harvest plans, including aggregated harvesting systems that more closely resemble natural disturbance patterns at the landscape level.

**LAG Commentary**

There is a conflict between Strategies 3.11.2 and 3.11.4 because the latter assumes the average cutblock size will be similar to the old two-pass system. However, as forest management moves towards aggregated harvest systems, the former two-pass cutblock system will be impossible to recreate. Thus, the next FMP needs to clarify that the two-pass system and associated metrics are no longer valid for the FMA area.

Reporting on planning unit size is justified, but their hectare size is misleading. The critical metric is the total disturbance on a given landscape. Landscape size and heterogeneity are the important timber and non-timber metrics. There also needs to be agreement from all stakeholders on the definitions of planning unit, disturbance unit and aggregation of cutblocks.

Stakeholders generally agree that forest landscape forecast models are of limited value if they do not include the effects of natural disturbance and anthropogenic activity. The requirement to include these models in an FMP needs to be examined to ensure that delivered products have and add value to the planning process.

**FMP Chapter 3 - Objective 18**: Al-Pac and the quota holders will continue to explore models that reflect succession and silvicultural treatments.

**LAG Commentary**

The LAG is concerned that the current timber supply models used to forecast AAC do not reflect the cumulative effects of fire and industrial activity in the FMA area.

**FMP Chapter 3 - Objective 20**: Identify a series of ecological benchmarks representative of the habitat diversity of the FMA area.

**LAG Commentary**

Al-Pac fulfilled the objective in the sense that it did identify potential benchmarks, but the actual designation was in the hands of the provincial government. The benchmark areas and parks that may be created by government may not be adequate as ecological benchmarks. The LAG is concerned that the range of habitat types is not fully represented at present and in currently proposed designations under the LARP.

**FMP Chapter 3 - Objective 23**: Identify spatially explicit, sustainable harvest levels (Timber Supply Analysis (TSA) – AAC calculation) that are sufficient for FMA area timber users and attempt to sustain the environmental and social values of the FMA area.

<table>
<thead>
<tr>
<th>FMP Page 147</th>
<th>Strategy</th>
<th>Indicator</th>
<th>Report Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.23.9</td>
<td>Model and retain old forest stands on the FMA area landscape within +/- 25 percent of the mean of the NRV.</td>
<td>NRV model; actual landscape</td>
<td>Model complete, but does not include fire and industrial activity (see Objective 24)</td>
</tr>
</tbody>
</table>

**LAG Commentary**

See LAG commentary on Objective 24.
**FMP Chapter 3 - Objective 24**: Within the gross FMA area, retain old-forest stand (over-mature forest stand) areas for each of the five main forest cover types within +/-25 per cent of the mean of the NRV.

**LAG Commentary (Objectives 23 and 24)**

LAG members note that while the strategies have all been completed, they deal solely with modeling. The stated objective is to retain old forest on the landscape, not just in the models. Thus, the forest companies can complete the strategies and still not achieve the objective.

Current timber supply models do not take into account fire and industrial activity, including the energy sector. As a result, there is a disconnect between the models and the reality on the landscape.

Models can provide guidance for planning and management. Modeling in this instance was a necessary precondition for planning, but it did not achieve the objective as written.

**FMP Chapter 4 - Objective 25**: Continue to conduct and facilitate research and development and implement innovations realized from R & D and other sources of input (e.g., operational experience, traditional knowledge studies, and regulatory change) through an AAM process.

**LAG Commentary**

Research has formed the basis for AAM. Some research has had immediate practical value and has led to changes in operations. Other research, while more theoretical, has contributed to maintaining the knowledge base as well as regional intellectual capital. We note that Al-Pac has recently focused more of its research support towards specific programs such as the ABMI, the ILM program at the University of Alberta, and boreal plains hydrology.

**Satisfactory Objectives with no LAG Commentary**

**FMP Chapter 3 - Objective 4**: Support AESRD in its strategies to minimize losses from epidemics of forest insects, diseases, infestations of restricted and noxious weeds, and large catastrophic fires on the FMA area.

**FMP Chapter 3 - Objective 9**: 1. Manage eight FMUs under an integrated (empirical yield curve set) planning system on the discreet land base; 2. Manage two FMUs under a mixedwood landbase system (mixedwood yield curve set) to maintain or increase both coniferous and deciduous fibre flows from the FMA area; and, 3. Manage FMU A15 through MOSA principles.

**FMP Chapter 3 - Objective 13**: Utilize reforestation treatments that provide for vigorous forest regeneration to meet or exceed reforestation standards in order to achieve yield objectives as set out in the TSA.

**FMP Chapter 3 - Objective 14**: Continue the maintenance and enhancement of a block-level silvicultural record keeping system that is compatible with AESRD requirements.

**FMP Chapter 3 - Objective 15**: Replace incidental conifer by regenerating or protecting sufficient conifer growing stock to produce an equivalent volume of conifer at rotation.

**FMP Chapter 3 - Objective 17**: Al-Pac, the quota holders and AESRD will design and implement Alternative Regeneration Standards (now called RSA) for FMA area forest growth and yield at the FMU level.

**FMP Chapter 3 - Objective 19**: Contribute towards the economic good of the region, and the responsible use and protection of the many social and cultural values.
**FMP Chapter 3 - Objective 21:** Minimize, through integration of industrial activities on the FMA area, the industrial footprint in terms of its size, intensity, distribution and duration on the landbase.

**FMP Chapter 3 - Objective 22:** Continue to develop and refine a system for predicting where heritage resources are potentially located and develop a process for incorporating potentially sensitive sites into operational planning.

**FMP Chapter 4 - Objective 27:** The forest companies will continue to participate in AESRD compliance audits.

**FMP Chapter 4 - Objective 28:** Al-Pac will maintain ISO 14001 and FSC certification of all applicable FMA lands.
Appendix I: History of Public and Stakeholder Engagement – the Transition to the LAG
(Sourced from LAG member input and Al-Pac FMA Area Forest LAG Governance Model of May 2008)

Al-Pac is a major and influential forest industry operator in northeastern Alberta with management responsibility for a large land base, and the need for community and stakeholder involvement in decision-making was recognized from the outset.

The FMTF, established in 1992 as Al-Pac began operating, was ground-breaking when it was first set up; very few, if any, other forest companies had similar initiatives to constantly seek direction and agreement from their communities of interest.

The FMTF was grounded in consensus building, an approach deemed necessary to overcome the controversy and public distrust of the times. The FMTF was formed as a policy and program decision-making body. Under the guidance of a mediation expert, FMTF members grouped themselves into caucuses of shared interests. Participants included senior representatives from the Alberta government, Al-Pac, as well as Aboriginal communities, hunting, trapping, fishing, recreational, and environmental interests.

Through consensus building, FMTF members found common ground to meld their concerns over the health and well-being of the forest and their various associations with it from economic, social and environmental perspectives. With the consensus building approach and use of caucuses, it was possible to make public and company policy and program decisions at the FMTF meetings. The company found the FMTF was extremely helpful in providing advice, assistance and recommended direction to the company.

The FMTF operated successfully in meeting both Al-Pac’s and the Alberta government’s needs for public involvement. The decision making capability of the FMTF was reflected by the use of lawyers specializing in mediation and consensus building as facilitators during the period from 1992 to 2002. Their skills proved invaluable to overcoming several controversies during that period.

In 1994, the environmental caucus withdrew its participation in the FMTF. This withdrawal was not based on dissatisfaction with the FMTF per se, but was a reflection of a dissatisfaction of the broader environmental community with a change in provincial policies towards corporate self-monitoring, a policy which was beyond the FMTF’s control or jurisdiction.

From its inception, the FMTF was viewed as unique, innovative, and successful. It garnered attention from academics who studied the process and, in 2000, the FMTF was recognized by the Alberta Emerald Foundation for Environmental Excellence.

In or around 2002, there began to be a change in the role of the FMTF. The provincial forestry regulator (now represented by AESRD) began to be more prescriptive in policy making and the development of guidelines as they strove for forest industry consistency in forest management planning. This resulted in the development of a provincial Forest Management Planning Manual3 and generic OGRs. Previously the plans and ground rules were developed for each FMA area by the companies so long as they met basic government requirements. The direction provided by AESRD also includes relatively prescriptive public involvement processes in terms of engagement and opportunities for comment.

Other factors that were harbingers of the changing role of the FMTF included:

- The Alberta government approved its Alberta’s First Nations Consultation Guidelines on Land Management and Resource Development in 2006. These establish requirements for consultation with First Nations in Alberta that must be actively planned, designed, implemented and reported on outside of the other stakeholder engagement, such as the FMTF.

- There was criticism of the FMTF by FSC certification auditors when Al-Pac that prompted a review of the process, structure and operation of the FMTF; this criticism was echoed by AESRD in their review of the 2006 FMP for Al-Pac’s FMA area.
- Al-Pac developed a Community Engagement Strategy that includes all of the company’s outreach and involvement initiatives; the preparation of this strategy was assisted by a sub-committee of the FMTF.

Based on the above factors, Al-Pac drew the conclusion that it was appropriate to change the emphasis of the FMTF to meet the requirements for the company, the regulators and FSC. Subsequently, it was proposed by Al-Pac that a forest Landscape Advisory Group be formed to provide a forum for discussion of issues and needs related to Al-Pac’s FMA area. The LAG is more closely aligned to the models that other companies use in their community engagement processes for planning of their FMA areas.
Appendix II: Certification and Compliance

Government agencies regulate virtually every aspect of Al-Pac’s operations. Compliance with regulations is a primary requirement for team members and contractors. Government inspections and internal audits provide further verification that high standards are being met. Voluntary certifications provide additional verification of performance.

Certifications

Forest Stewardship Council

In November 2004, a team of experts assessed Al-Pac’s operations for potential sustainable forest management certification under demanding standards established by the FSC. Al-Pac received the experts’ report in early 2005 and responded to its comments and recommendations. A decision on certification was made later in 2005, and Al-Pac’s FMA area became the largest single certified forest in the world to receive this certification, the first in the western boreal forest. In 2010, Al-Pac underwent a complete successful re-certification to the FSC standard.

ISO

Al-Pac participates in various ISO certification processes, which includes:

- ISO 9001:2008 – is primarily concerned with quality management and sets out guidelines to ensure that an organization’s products or services satisfy the customer’s quality requirements.
- ISO 14001:2004 – is primarily concerned with environmental management and ensures an efficient and effective management of processes that have an effect on the environment.

Progressive Aboriginal Relations

PAR is an identifying hallmark indicating that a business is committed to increasing Aboriginal employment, assisting business development, building individual capacity and enhancing community relations. Al-Pac is currently certified to a PAR Gold level. PAR is a program of the Canadian Council for Aboriginal Business (refer to http://www.ccab.com).

Partners in Injury Reduction (PIR)

PIR is a program of the Workers’ Compensation Board, Alberta Human Services and the Alberta Safety Council to increase safety awareness and reduce accidents.

Compliance

In 2011, Al-Pac received an administrative penalty for a spill at the river pump-house. This was the only Al-Pac mill-related enforcement action resulting in a penalty in the past six years.

Table 4 illustrates Al-Pac forestry-related enforcement actions resulting in penalties from 2006 to 2010.

Government agencies regulate virtually every aspect of Al-Pac’s operations. Compliance with regulations is a primary requirement for team members and contractors. Al-Pac had 13 non-compliance enforcement actions in the reporting period. Heavy rains and the timing of harvest activity termination contributed to the 2006 incidents. Other watercourse incidents are usually due to harvesting activity in unmapped watercourse and were not initially seen by the layout crew. These enforcement actions have resulted in steps being taken to address maintenance, prevention and inspection issues raised by the incidents.

In the same 2005 to 2006 period, throughout the FMA area, quota holders and other logging contractors had a total of 18 enforcement actions. These actions can be viewed on the AESRD website.
### Table 4: Al-Pac – AESRD Enforcement Actions (2006 to 2010)

<table>
<thead>
<tr>
<th>Date Assessed or Recommended</th>
<th>Penalty, Warning, Waiver or Closed</th>
<th>Amount</th>
<th>Planning Unit</th>
<th>Date of Infraction</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 June 2006</td>
<td>Penalty</td>
<td>$1500</td>
<td>6810 (FMU L1)</td>
<td>28 April 2005</td>
<td>Deposition of soil into watercourses in sections 18, 19, 20, 30 &amp; 32. Original penalty of $600 recommended.</td>
</tr>
<tr>
<td>15 January 2007</td>
<td>Penalty</td>
<td>$800</td>
<td>6810 (FMU L1)</td>
<td>8 September 2005</td>
<td>Failed to install a culvert and obstructed another channel VAF-8049291L.</td>
</tr>
<tr>
<td>14 August 2007</td>
<td>Penalty</td>
<td>$500</td>
<td>6810 (FMU L1)</td>
<td>2 June 2006</td>
<td>Crossing ephemeral with log; water backed up NE23, W14, NE14, SW8 &amp; SE7-68-10.</td>
</tr>
<tr>
<td>14 March 2007</td>
<td>Penalty</td>
<td>$655.56</td>
<td>6810 (FMU L1)</td>
<td>6 June 2006</td>
<td>Stream buffer two small permanents; SW18 small permanent outside of the block buffer down to 15 metres; NW16 small permanent in block insufficient buffer to no buffer.</td>
</tr>
<tr>
<td>14 July 2009</td>
<td>Penalty</td>
<td>$1000</td>
<td>7113 (FMU L1)</td>
<td>12 August 2007</td>
<td>Harvest understorey block with no authority.</td>
</tr>
<tr>
<td>12 May 2009</td>
<td>Penalty</td>
<td>$1000</td>
<td>6810 (FMU L1)</td>
<td>2 November 2007</td>
<td>Crossing needs cleaning at Touchwood Lake.</td>
</tr>
<tr>
<td>6 August 2009</td>
<td>Penalty</td>
<td>$1067.20</td>
<td>7319 (FMU L2)</td>
<td>14 November 2007</td>
<td>75 metre buffer on Amadou Lake verified by silviculture team.</td>
</tr>
<tr>
<td>6 August 2009</td>
<td>Penalty</td>
<td>$1067.20</td>
<td>7111 (FMU L1)</td>
<td>11 December 2007</td>
<td>Insufficient buffer on water course FC07111409871.</td>
</tr>
<tr>
<td>2 April 2010</td>
<td>Penalty</td>
<td>$1000</td>
<td>FMA</td>
<td>18 March 2008</td>
<td>Wood left beyond 24 months 100 TMR 100(d).</td>
</tr>
<tr>
<td>17 March 2010</td>
<td>Penalty</td>
<td>$500</td>
<td>8303 (FMU L11)</td>
<td>18 March 2008</td>
<td>Excessive waste TM 100e.</td>
</tr>
</tbody>
</table>