



**Industry:** Paper and forest products

**Duration:** 2006 – 2011

**Location:** NW Alberta

**Case study type:** Research

# Earthcover, waterbird and water chemistry inventory for Weyerhaeuser Alberta Forest Management Areas



Weyerhaeuser, one of the world's largest forest products companies, has offices or operations in 10 countries with customers worldwide. Weyerhaeuser is principally engaged in the growing and harvesting of timber; the manufacture, distribution and sale of forest products; as well as real estate development. It is the world's largest private sector owner of softwood timberland and holds logging rights to more than 5.35 million hectares of land in Canada. Weyerhaeuser has approximately 16,500 employees globally including approximately 1,900 employees at 7 operations in Canada. Canadian operations currently include facilities in the provinces of British Columbia, Alberta, Saskatchewan and Ontario, producing a range of pulp, lumber and engineered wood products for Canadian and international markets.

## Weyerhaeuser's perspective on biodiversity

### Impacts on biodiversity

Forest operations can have impacts on biodiversity during the harvesting, hauling and production phases. These can include direct loss, degradation or fragmentation of habitat due to harvest methods as well as air and water-borne pollutants from processing facilities. One area of concern is the potential to damage wetlands and fish habitat.

Weyerhaeuser has operated in Canada since 1965 and holds the philosophy that sustainability of the forests is not only key to a healthy planet, but also key to its own success and growth. In Canada, Weyerhaeuser manages public forestland under long-term licences through government regulated tenure systems. First Nations, environmental organizations, local communities and other stakeholders are invited to comment on management plans.

### Sustainable forest policy

Weyerhaeuser manages its forests for the sustainable production of wood and wood products that meet customers' needs. Weyerhaeuser is committed to independent certification of its forest management practices and products and to meeting the principles and objectives of applicable forest certification systems. Its Canadian operations are certified to a third-party audited forest management standard, the Sustainable Forestry Initiative Standard (SFI), which is recognized by the Programme for Endorsement of Forest Certification (PEFC), Weyerhaeuser's policy applies to company-owned and managed lands worldwide and includes:

- harvesting at sustainable rates;
- reforestation by planting or planned natural-regeneration;

- protecting soil stability and long-term productivity;
- meeting or exceeding applicable water-quality laws and best management practices to protect water quality;
- providing a diversity of habitats for the conservation of biological diversity;
- protecting species of concern, including cooperating with government agencies to determine how forestlands can contribute to their conservation.

Where species of concern are present, Weyerhaeuser seeks to design and implement forest-management practices to help in the conservation of these species and the habitats they need. It also engages in cooperative research to expand its knowledge of the needs of these species. For example, for woodland caribou, Weyerhaeuser initiated a 5-year deferral of timber harvest on 82,000 hectares of key caribou range in Alberta. This allowed time to develop research-based forest management plans which address important caribou habitat areas and a recovery planning process to be put in place by the provincial government.

### Environmental core policy

It is Weyerhaeuser's core policy to be responsible environmental stewards wherever it does business and may have an environmental impact. It practices sustainable forestry, sets and meets goals to reduce pollution, conserves natural resources and energy, and continually improves its environmental performance. All employees and leaders worldwide are accountable for managing and operating all businesses by:

- complying with all applicable environmental laws and company environmental standards;
- managing the environmental impacts of their business activities and products;
- resolving noncompliance promptly;

- ensuring all personnel understand environmental obligations, acquire education and training to enable them to carry out these responsibilities and understand that they are a critical part of their jobs;
- tracking and publicly reporting on environmental performance.

## Environmental compliance

Weyerhaeuser has environmental audit programs to track compliance. In addition to identifying potential risks and areas for improvement, these audits also identify best practices, which are then shared across the company.

Weyerhaeuser strives to meet or exceed all applicable water quality requirements. It recognizes the contribution of wetlands and water to biodiversity and best management practices are developed and shared that protects water quality, waterbodies and riparian areas.

## Supply chain

Suppliers must comply with Weyerhaeuser’s EHS requirements. They must also act in accordance with Weyerhaeuser’s supplier code of ethics when working on its behalf.

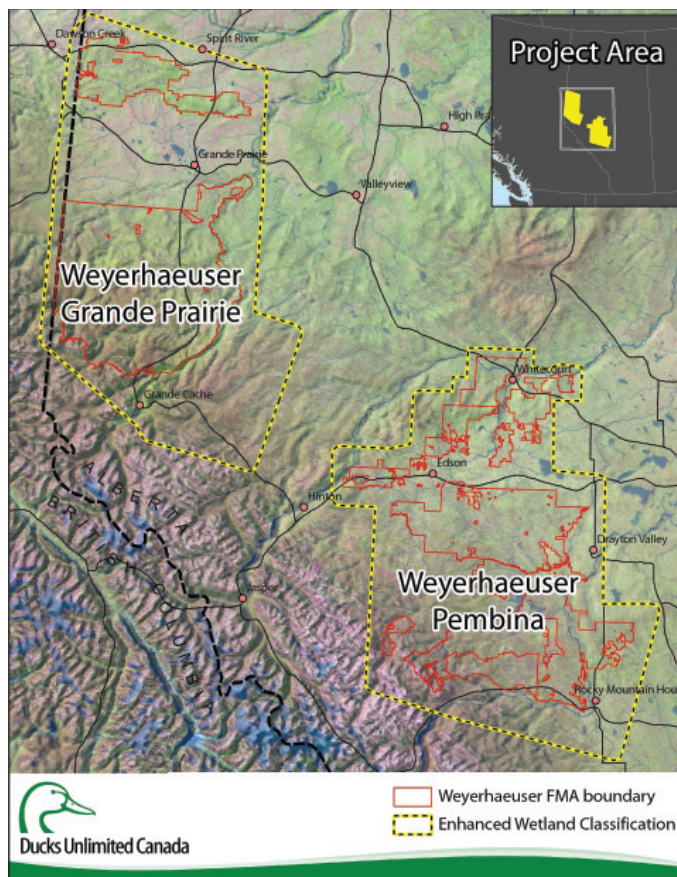
# Earthcover, waterbird and water chemistry inventory for Weyerhaeuser Alberta Forest Management Areas

## Rationale

Making sound management decisions pertaining to access, harvest locations and timing, as well as research and many other activities, requires a wide breadth of information. The information gained from these wetland and waterbird inventories will provide Weyerhaeuser managers and other industries and organizations with the knowledge needed to make environmentally sound decisions in and around wetlands and other aquatic habitats.

## Description

Three-quarters of Canada’s forest are in the boreal. The boreal (or “northern”) forest is a vast area stretching through Canada, Alaska, Norway, Sweden, Finland and Russia. About 70% of the boreal forest in Canada remains undeveloped. It is home to the world’s largest populations of caribou, wolves, grizzly bears and lynx. It is also the breeding ground for an estimated one-third of North America’s land birds and 40% of its waterfowl.



Weyerhaeuser has supported a number of projects that relate directly to sustainable management of the boreal forest. In 2006, Weyerhaeuser and Ducks Unlimited Canada agreed to fund and conduct jointly a 5-year research project on migratory bird habitat on 2.1 million hectares of Weyerhaeuser-managed land in Alberta. This area includes the Forest Management Areas (FMAs) of Drayton Valley, Edson and Grand Prairie.

The objectives of this project are to collect information on waterbird populations and water chemistry and to create the fundamental data layers necessary to provide a GIS-based wetland mapping and classification system for Weyerhaeuser Alberta FMAs.

The results of this project will lead to watershed-based forest management plans that will help protect key wetlands, help maintain watershed health, establish enhanced best management practices to advance sustainable development, and provide better information to protect key nesting and stopover areas for a multitude of North America’s migratory waterbirds.

## Earthcover inventory

Mapping and classification will result in 25 to 40 wetland and upland cover types being identified. This will be coupled with detailed site descriptions (vegetation data, landform, position in the landscape), critical in determining the distribution of wetlands and uplands and how water moves across the landscape. The approach is to map the boreal forest as an entire ecosystem using recent LandSat Thematic Mapper (TM) satellite imagery and a standardized hierarchical classification scheme that is suited to analysis at multiple scales.



This enhanced wetland classification recognizes up to 19 wetland types that conform to the five major wetland classes: *swamp*, *bog*, *fen*, *marsh* and *shallow water* of the Canadian Wetland Classification System.

The purpose of this activity is to provide recent, regional-scale baseline inventory of the various upland and wetland cover types found within the Weyerhaeuser Project area in western Alberta. These inventories will help provide resource managers, researchers, industry, and other organizations with detailed information on the spatial distribution of upland and wetland cover classes for use in making management decisions, research and many other activities.

The final product will be up-to-date landscape-level coverage of upland and wetland cover types and an ecologically-based wetland classification system for the project area. This classification will be the foundation for undertaking the waterbird and water chemistry inventories, future modeling, additional research and potential area change assessments. This information will then feed in to the development of Best Management Practices around wetlands and timber harvesting.

## Waterbird inventory

The goal of conducting waterbird (e.g., ducks, geese, swans, grebes, loons) surveys is not only to gain information about waterbirds and wetland ecosystems but also to contribute to establishing forest management strategies that minimize differences between natural and anthropogenic disturbance on waterbirds. The waterbird inventory will be conducted from a helicopter by surveying all water types (lakes, ponds and streams). Data will be used to identify key wetlands and to develop predictive models that will be used to develop wetland/watershed-based conservation strategies for the project area.

In each year of the project, Ducks Unlimited Canada will conduct two waterfowl breeding pair surveys (May, June) and two brood surveys (June, July) that will include an inventory of other wetland-associated migratory birds.

## Water chemistry surveys

Water chemistry analysis will help define linkages between uplands and wetlands, and groundwater to wetlands as well as the range of wetland productivity and waterbird use. This will help determine the effects of various land-use practices on wetlands, and guide activities to ensure the maintenance of water quality, water supply, wetland functions and overall watershed health.

Surface water will be collected and analysis will be undertaken to measure selected water chemistry parameters for the purpose of understanding relative wetland productivity and to determine a regional water chemistry profile for the project area. Analysis will include characterization of pH, conductivity, salinity, nutrients and dominant ion composition. This analysis will assist in defining:

- linkages between uplands and wetlands;
- groundwater to wetland linkages;
- productivity and waterbird use;
- the range of variability of wetland productivity within the project area.

Collection and analysis of samples for isotopes will assist in determining the relative importance of ground water versus surface water inputs to these systems. This in turn will allow development of hypotheses on the effects of various land-use practices on wetland water quality and productivity. These data will help determine how landscape features (hydrology, relief, till deposits) may affect wetland productivity.

Ducks Unlimited Canada and Weyerhaeuser will work together to develop and promote new science-based sustainable development activities, which will guide better land-use decisions. An initial collaborative research topic to build on the knowledge gained through the partnership will focus on assessing watershed vulnerability and, in turn, on determining the resiliency of varying amounts of wetland to harvesting activities.



In addition to supporting Ducks Unlimited Canada's inventory work, Weyerhaeuser will collaborate on research to develop, improve and inform on best management practices including stream and lake buffers and effect of roads on subsurface hydrology.

### Communication

Weyerhaeuser believes that hands-on, community based environmental education is essential to help people understand issues and make informed choices.

Weyerhaeuser supports and participates in selected environmental education programs that focus on developing critical thinking skills and improving environmental literacy.

### Stakeholders and roles

**Weyerhaeuser:** Weyerhaeuser provided funding support (through FRIAA Association), forest management expertise, in kind contributions and shared the project management role.

**Ducks Unlimited Canada:** DUC responsibilities included project management, field data collection and data analysis. They also provided wetland and waterbird expertise and project funding.

## Outcomes

### Benefits

#### Economic

Information gathered during the course of this project will help Weyerhaeuser forest managers make more informed decisions on such things as harvest block location and road and culvert placement. Understanding both overland and underground water flow allows managers to strategically place operations to minimize the impact on the environment and reduce such things as road erosion and seedling mortality. This has the potential to reduce road maintenance and silviculture costs.

### Biodiversity

This project will address knowledge gaps and lead to an enhanced understanding of the boreal wetland systems (wetland types – forested and non-forested, distribution, extent and connectivity throughout the landscape), associated waterbird biodiversity and forest hydrology for the three Weyerhaeuser FMA's in Alberta. This information will help advance sustainable development, help protect key wetland systems and maintain watershed health that in turn will benefit biodiversity and the people of Alberta.

## Lessons learned

To date, this project has helped to enhance the comprehensive picture of interconnectivity of water on the landscape. It has allowed foresters to better understand the relationships between surface and subsurface water, and it has provided tools, such as improved monitoring methodologies, that will help identify potential impacts on sensitive or key waterfowl habitats.

### Impact on company

The results of this work will lead to enhanced wetland mapping and tools to advance watershed-based forest management planning and practices on forestlands managed by Weyerhaeuser Company.

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