Forestry in BC
Outline

• What is Forestry?
• Ecological Context
• Management Context
• Current Issues
Forest management is the scientific management of forests for continuous production of goods and services.

This includes:
- forest protection
- co-ordination of multiple uses
- harvest regulation
- forest renewal and tending
The case for forest management:

What kinds of disturbance events lead to forest denudation?
What normally happens following denudation?
What features of forests make them susceptible to overuse and degradation?

1. Charcoal production, Catalonia Spain
2. Forest litter harvesting near Kunming, China
What happens when local forests run out?

4. Route to Annapurna base camp, Nepal
5. BC at time of European colonization, 1778
“Forestry is an art born of necessity, as opposed to arts of convenience and of pleasure. Only when a reduction in the natural supplies of forest products under the demands of civilization necessitates a husbanding of supplies, or the application of art or skill or knowledge in securing a reproduction, or when unfavourable conditions of soil or climate induced by forest destruction make themselves felt does the art of forestry make its appearance.”

B.E. Fernow, Dean, Faculty of Forestry, University of Toronto, 1911.
Who do foresters manage for?
What do foresters manage for?
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BC is geographically diverse
Complex topography creates a varied climate
Interplay between Arctic and Pacific air masses
Biogeoclimatic Zones of British Columbia

- Boreal Alfai Fescue Alpine
- Coastal Mountain-heather Alpine
- Interior Mountain-heather Alpine
- Spruce -- Willow -- Birch
- Boreal White and Black Spruce
- Sub-Boreal Pine -- Spruce
- Sub-Boreal Spruce
- Mountain Hemlock
- Engelmann Spruce -- Subalpine Fir
- Montane Spruce
- Bunchgrass
- Ponderosa Pine
- Interior Douglas-fir
- Coastal Douglas-fir
- Interior Cedar -- Hemlock
- Coastal Western Hemlock

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A more detailed version of this map at a 1:2,000,000 scale can be obtained from:
BEC

• Biogeoclimatic Ecosystem Classification (BEC) system.
• Zones reflect differences in regional climate and are classified based on leading overstory tree species on zonal sites at ‘climax’.

• http://www.for.gov.bc.ca/hre/becweb/
• Site series are distinct vegetation communities along a topographic sequence.

• On zonal site series moisture regime reflects climate.
Coastal Douglas-fir Zone –

dry, warm summers; wet, mild winters. Maritime (oceanic), semi-Mediterranean (temperate) climate

Canada’s “banana belt”

Douglas-fir, grand fir, arbutus, Garry oak, bigleaf maple

Low elevation

Fire, root rots, drought
Coastal Western Hemlock Zone –

wet cool winters, generally mild to warm summers.

Coastal, montane climate

Canada’s temperate rainforest

Western hemlock, Douglas-fir, amabilis fir, western redcedar

Low to medium elevation

Wind, Fire, landslide, decay
Mountain Hemlock Zone –

long, cool–cold winters, deep snowpack (2-10m), short warm summers. Coastal subalpine climate

Canada’s west coast, “warm snowpack” subalpine forest. The west coast ski zone

Mountain hemlock, amabilis fir, yellow cedar

Medium to high elevation

Avalanche, wind, snowpress
Interior Douglas-fir Zone –

Relatively short cool to cold winters; long, hot, dry summers. Montane. Sub-continental climate

Canada’s western savannah forest

Douglas-fir, lodgepole pine, ponderosa pine, western larch, grand fir, western birch, aspen

Low to medium elevation

Fire, insects (bark beetles, defoliators), root rots
Ponderosa Pine and Grassland Zones –

Very dry, long hot summer, relatively mild to cool winters.
Semi-arid, subcontinental climate

Canada’s semi-desert forest/western grasslands

Low elevation – valley bottoms

Ponderosa pine, Douglas fir, juniper, sage,

Fire, drought, browsing
Montane Spruce Zone –

Long, cold, snowy winters, warm summers; relatively dry.
Subcontinental, montane climate

Medium to high elevation plateaus

Interior spruce, subalpine fir, lodgepole pine, Douglas-fir, aspen

Medium to high elevation

Fire, insects (bark beetles, defoliators)
**Interior Cedar-Hemlock Zone –**

- wet, mild to cool winters; warm, relatively moist summers.
- Subcontinental, humid climate

**The interior wet belt forest**

- Western redcedar, western hemlock, Douglas-fir, lodgepole pine
- Low to medium elevation

**Fire, defoliators**
Engelmann Spruce Subalpine fir Zone –

Long, cold to very cold, snowy winters; short warm summers with frequent frost, dry to humid. Continental – subcontinental subalpine climate

The interior, cold snowpack, subalpine forest
The interior ski zone

Engelmann spruce, subalpine fir, lodgepole pine, whitebark pine, subalpine larch

Medium to high elevation

Fire, insects
SBS – Sub-Boreal Spruce

Moderated Continental Climate

- Mean Temperature 4 °C
- Growing Degree Days 1200
- Frost Free Period 85
- Extended periods < -10 °C
- Extremes to -50 °C
- Precipitation 650 mm
- Precipitation as snow 40%
- Luvisols, Brunisols
SBS – Sub-Boreal Spruce

• Interior Plateau (700 m)
• Rolling terrain, gentle slopes, lakes and wetlands

• Montane forests to south
• Boreal to north
• Drier Sub-Boreal Pine Spruce to southwest
• Subalpine above

• Very productive for timber
• Cattle grazing
• Trapping / hunting

• Wind, insects, fire
Early seral species:
- Paper birch
- Trembling aspen
- Lodgepole pine
- Douglas-fir (limited by growing season frost)

Late seral tree species:
- Hybrid white spruce (*Picea engelmannii* x *glauca*)
- Subalpine fir
Continental climate
- Mean Temperature: -2 °C
- Growing Degree Days: 550
- Frost Free Period: 70
- Very cold winters
- Extremes to: -60 °C
- Soils freeze
- Short, warm summers
- Precipitation: 450 mm
- Precipitation as snow: 40%
- Luvisols, Gleysols, Organic

Most widespread zone in Canada, from the Yukon to Newfoundland
Great Plains east of Rockies, northern BC valleys
Northern Great Plains and valleys in Northern Rockies
- Flat to rolling, valley bottoms
- 400 m

Most northerly forested zone

Productive for timber
- Trapping, abundant game east of Rockies
- Some grain and beef farming at southern edge

Fire and insects
Most of our forest ecosystems are disturbance driven, and disturbance dependent.
Bark beetles
Forest Damage Trends for Canada

Area of losses is 10-20 times the annual harvest area (1MM Ha)
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Forest products account for 30-45% of BC exports
The Evolution of Forestry

Local people with experience-based wisdom → Sustainable Exploitation — Passive Management — Active Management

Replaced by

Non-sustainable exploitation → Resource depletion

Leads to

Administrative forestry

Evolves into

Ecologically-based forestry, often initially timber biased

Application of social and biophysical sciences that respect the ecology and sociology of desired values

Sustained timber production

Social forestry – ecologically-based, multi-value ecosystem management.

Pressure from ecologically and socially inappropriate belief systems, actions and events, and incomplete knowledge about nature

Non-locals without local knowledge
Eras in BC Forestry:

**Pioneer** (1865-1912): revenue, land clearance

**Transition** (1912-1945): conservation, reforestation

**Sustained yield** (1945-1978): sustained production, industrial and community development, multiple use

**Ecologically based** (1978-1994): silviculture prescriptions, licensee responsibility for free-growing, backlog reforestation, genetic improvement, species management

**Sustainable forest management** (1994-): social license, biological diversity, ecosystem management, non-timber forest products and values, community participation
Forest use is regulated by society. In BC legislation includes:

**Forest Act** - defines forests and conditions of licences

**Ministry of Forest Act** - sets out management objectives for public forests, and role and powers of MOF

**Forest and Range Practices Act** - sets standards of practice, environmental protection, and public participation

**Foresters Act** - establishes Association of BC Forestry Professionals as self-regulating profession with exclusive right to practice.
13% in Protected Areas

Annual Cut 65 million m³

95% of BC’s forest land is publicly owned
54 million ha is certified (CSA, SFI, FSC)
25 million hectares of old-growth forest

4.5 million hectares protected old-growth, plus 11.5 million hectares in conservation or inoperable areas

Great Bear Rainforest Agreement
https://greatbearrainforest.gov.bc.ca/
Is this a “sunset industry”?
http://cfs.nrcan.gc.ca/selective-cuttings/43
Exports of Canadian forest products by province, 2017

Current annual harvest 74 million m$^3$

(Natural Resources Canada)
18 million ha in 2015

Area (ha)

- MPB
- Fire
- Harvest
- Planting

(Statistics Canada)
But what about the wildlife?

- 1700 mountain caribou (southern), in rapid decline
- < 10 pairs of spotted owl, in rapid decline
- 66,000 marbled murrelet, in decline
- 13,000 grizzlies, stable, but extirpated in 10% and declining in 8% of historic range

http://www.env.gov.bc.ca/cdc/

(BCMOE Conservation Data Centre)
Historic forest practices have improved........
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Climate Change

http://www.livesmartbc.ca/government/plan.html

http://www.genetics.forestry.ubc.ca/cfcs/climate-models.html
2015– 18 million ha

Forest-Rural Interface

“The summer of 2003 was the worst ever for forest fires in British Columbia. Abnormally hot, dry weather resulted in over 2,500 wildfire starts …. The interface fires of last summer destroyed over 334 homes and many businesses, and forced the evacuation of over 45,000 people.” (2650 km²) Filmon 2004

http://www.2003firestorm.gov.bc.ca/
http://bcwildfire.ca/faq/interface.htm
http://cfs.nrcan.gc.ca/subsite/disturbance/map-carte

August 25, 2009:
“Destructive wildfires that have scorched nearly 2,000 square kilometres … There are still nearly 150 forest fires burning across the province and at least five of them have prompted evacuation orders keeping residents from their homes.”

Sept 2017 1200 fires, 11,650 km²
Mill Closures

B.C. pulp mills refusing to pay taxes

Two B.C. pulp and paper companies say their municipal tax bills are too high and they are refusing to pay up, leaving several rural communities wondering how they'll cover their own bills this year.

Castlegar Mayor Lawrence Chernoff said he learned of the tax revolt just hours before the tax deadline when the local pulp mill, Celsar, notified the city that instead of paying its $3.6 million tax bill, the company is planning to fight it in court.

BC - 10,000 forestry jobs gone in past year

Almost 10,000 forestry sector jobs have been lost in the province of British Columbia in just this last year alone.

The Vancouver Sun surveyed all the forestry companies in British Columbia that reported a layoff since January 2007. The results show that 34 mills are down either permanently or indefinitely. Twenty-three have curtailed shifts or introduced job-sharing. The cost in jobs lost, both permanent and temporary, has climbed to 9,597.

Tembec announces mill closures

After recent news of indefinite mill closures slated for Carter sawmill operations in Radium, Valemount and Rustad, Tembec Forest Products has now confirmed that it will be stopping production at two of its East Kootenay mill operations.
Generating More Value from Our Forests
A Vision and Action Plan for Further Manufacturing
Utilize waste wood from phased-out beehive burners to produce clean energy.

Support wood gasification research, development and commercialization.

http://www.energyplan.gov.bc.ca/bioenergy/
Tenure Diversification

20% of Major Licences to be redistributed

http://www.for.gov.bc.ca/hth/community/
http://www.for.gov.bc.ca/mof/plan/frp/
Change in forest area
How much resource extraction do we want and what should we do about resource dependent communities?
Should we substitute intensive plantation silviculture for managing natural forests?
What do our communities want from their forests?
What do our communities want from their forests?

- Protection from natural disaster and forest loss
- Employment and sustainable industry
- Diversification of opportunity
- Recreation, hunting and fishing
- Food and botanicals
- Wood and energy
- Value added and market opportunities
- Spin-off jobs and industries
- Complimentary jobs and industries
- First Nations reconciliation
What do our communities want from their forests?

Forestry today must work to protect community interests and a future in more than timber.
What are the dynamics of forestry?

**Increasing:**
- Expectations
- Economic risk
- Biological risk
- Need for flexibility
- # of users

**Decreasing:**
- Economic returns
- Willingness to trade off
- Biodiversity
- Interest in careers

**Solutions:** community involvement, value added, stakeholder participation, planning for resiliency
Challenges in BC forestry:

Mountain pine beetle and its aftermath

Climate change, pathogens, movement of ecosystems and species

Unresolved First Nations land claims, access to resources

Shrinking contribution of timber production to provincial GDP

Increasing urbanization in southern BC, decline of rural communities

Renewable energy installations, new transmission corridors

Shortage of skilled workers and professionals in forest sector

Global markets and conventions
Opportunities in BC forestry:

Development of a collective cultural identity and value system that connects us to BC landscapes and ecosystems

Resolve First Nations land claims and partnerships

Less general revenue but more value via Community Forests

Working up the value chain via log and timber frame buildings and wood crafts

Extensive forest management; non-timber forest products

Eco-tourism, carbon sequestration, bioenergy

Export of forest management expertise and technology
What lessons have we learned?

- Diversity is critical to our future
- Our forests need to be resilient and healthy
- We need all the friends we can get:
  - business and trade
  - community
  - internationally
In Summary:

- BC is ecologically diverse
- We have a large, productive forest and low population density.
- Our forest management is state-of-the-art, but profits are declining.
- Climate change, forest health, fuel build-up
- We are still converting old-growth.

- We need to make choices, with the luxury of having options!