Forest Management Planning

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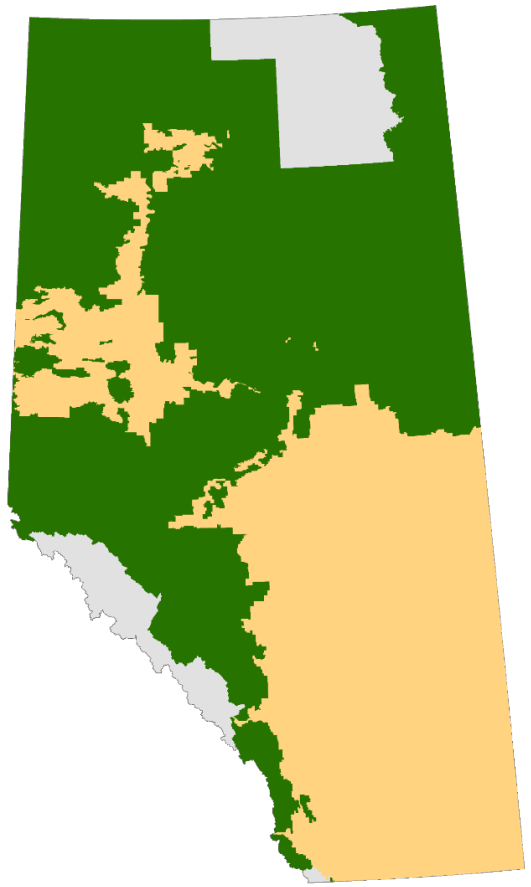
FMP Planning Process

- Technical aspects
  - Inventories
  - Landbase processing
  - Growth and Yield
  - Timber supply model
  - Documentation
- Cooperation with GoA
  - VOIT’s
- Consultation
- Several years to complete FMP
- New plan required every 10 years



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Building a Timber Supply Model

Combines the landbase, yield curves, and assumptions regarding future activity

Building a Timber Supply Model

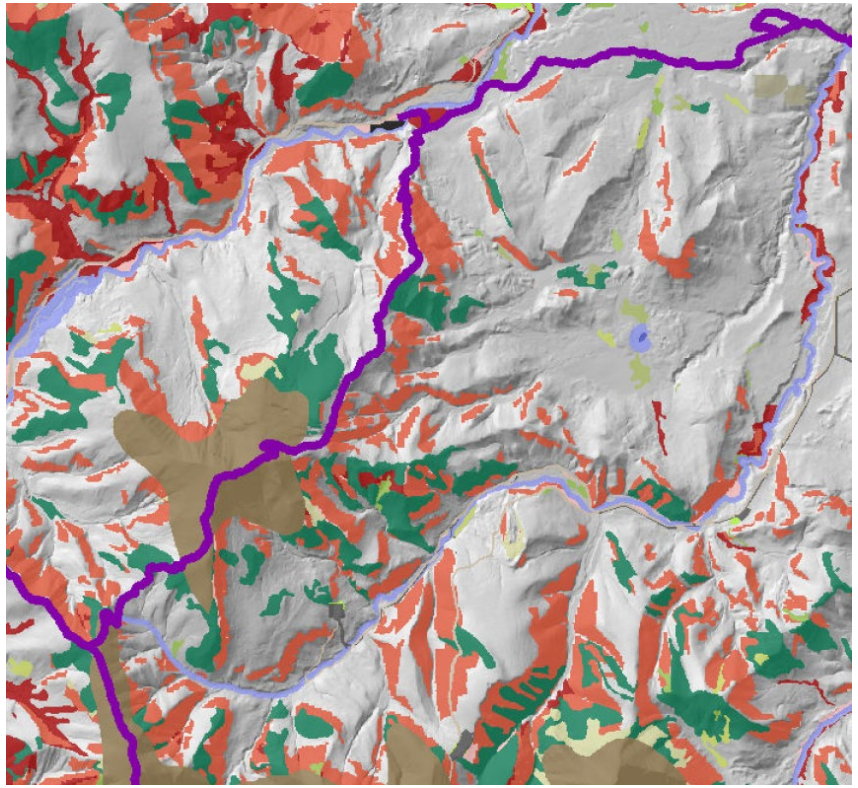
- Incorporates components into a model that predicts compares outcomes for various strategies
  - 200-year planning horizon
  - Spatial solutions showing timing of individual stands
- Common model platforms are:
  - Spatial Woodstock
  - Patchworks

Landbase Processing

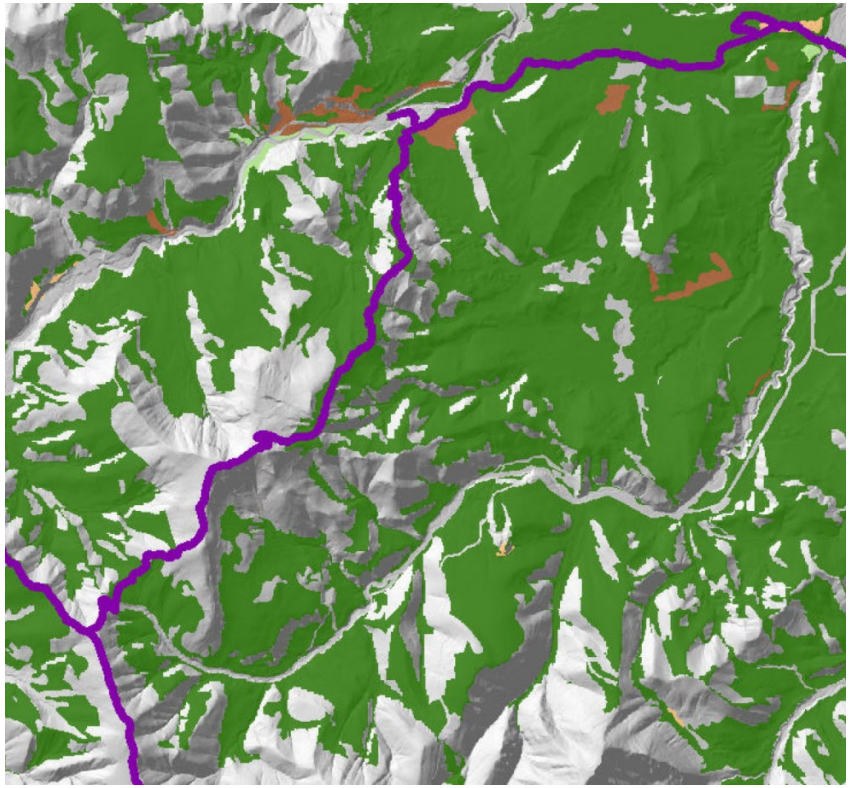
- GIS exercise to combine all input datasets into one layer
- Many decisions are represented in how layer is built
- Exclusion areas
  - Parks & private land
  - Rare species
  - Recent fires
  - Other industry activity
- Ground rules
  - Water buffers
  - Structural Retention
- Operability concerns
  - Unproductive lands
  - Steep slopes
  - Wetlands

Landbase

Deletions

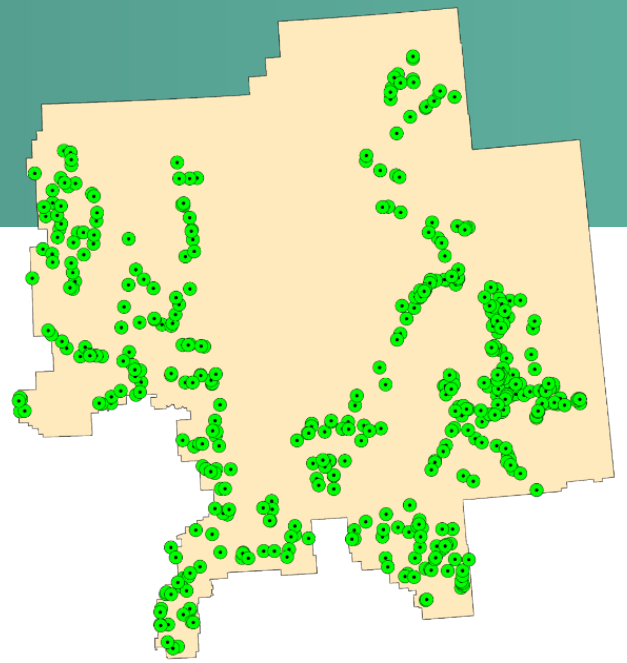


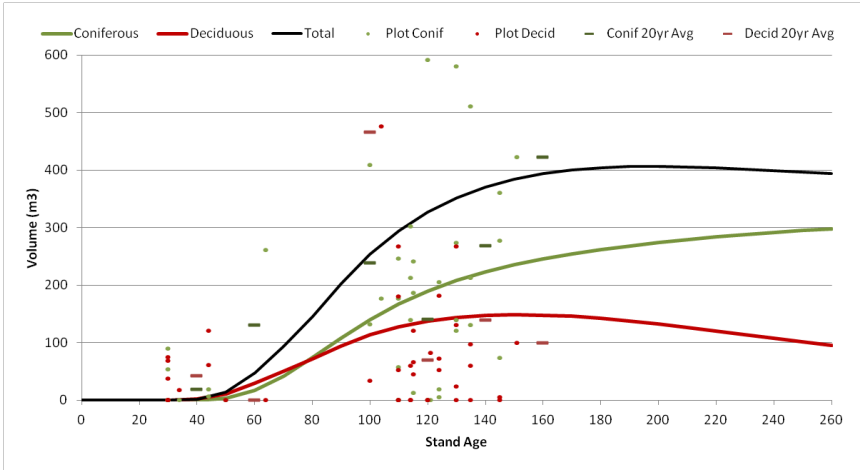
Activity Allowed



Growth and Yield

- Process of sampling forest to estimate future growth
- Network of sample plots at various ages established across forest.
- Statistical process to generate yield curves – empirical or growth models





Transitions

- Defines what age and what stand types are likely to grow back after disturbance
  - Natural succession
  - Harvest
  - Energy industry
  - Fire, insects
- Species types
- Density
- Regeneration Lag
- Length and severity of disturbance

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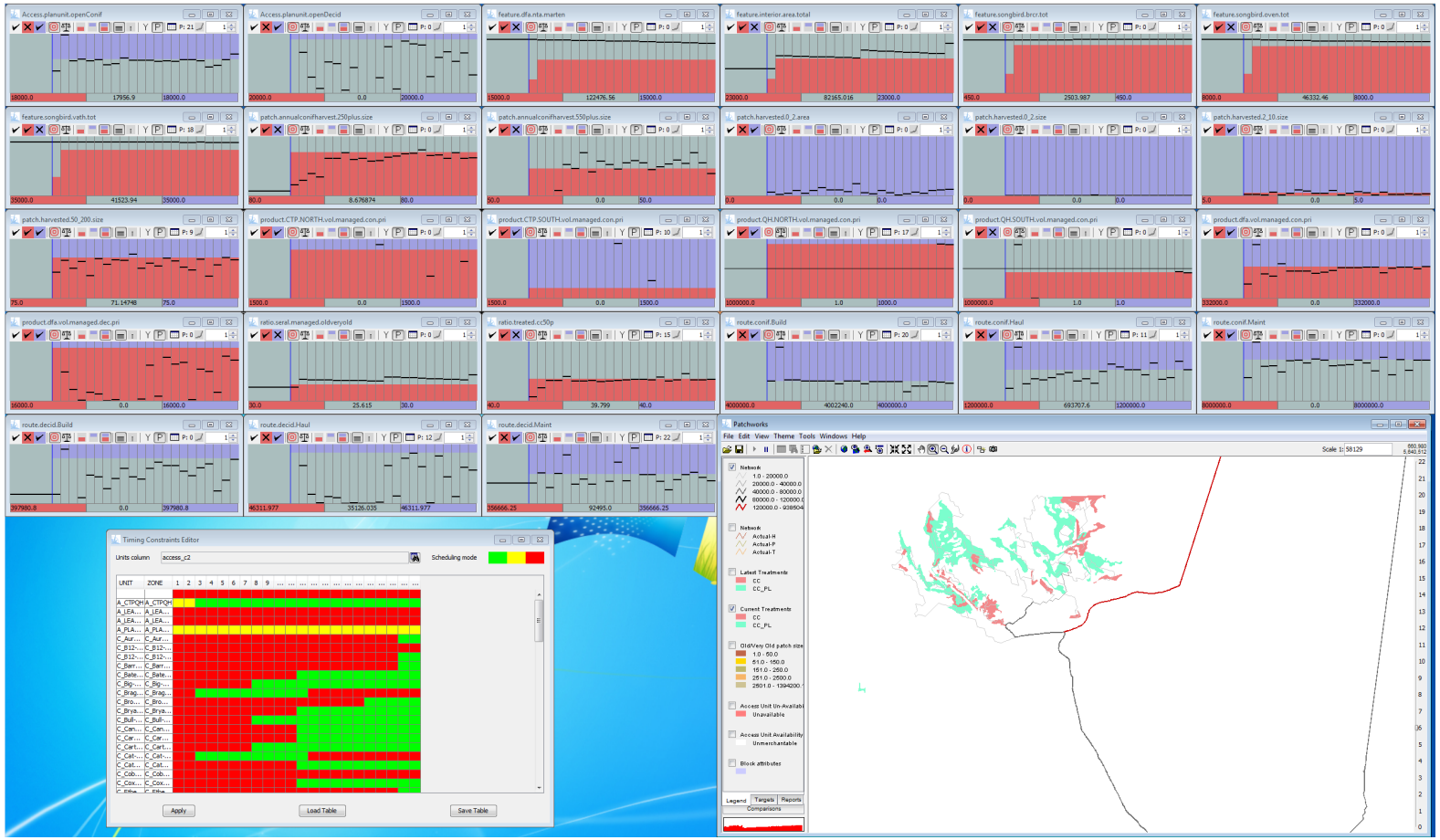
Timber Supply Analysis

- Use model and discuss outputs with client and GoA representatives
- Spatial Harvest Sequence
  - First 70 years must be presented spatially
  - First 20 years is most scrutinized
- Companies are tied to the SHS
  - Operational issues
  - Variance reporting is strict

Patchworks Interface



TSA Modelling Environment

- Change future forest condition by growing vegetation
  - Volume
  - Age
- Changes the future condition by applying management actions
  - Clearing land – harvesting or energy industry activity
  - Re-vegetating clearings after action is complete
  - Time delay between clearing and re-vegetation is user defined
- Reports on the future condition
  - Indicators
  - Activities

TSA Control

- Goal is to determine the best placement and timing of activity
  - Test assumptions through sensitivity analysis
- Some metrics are post-processed and cannot inform the solution
  - Buffers around features

TSA Control

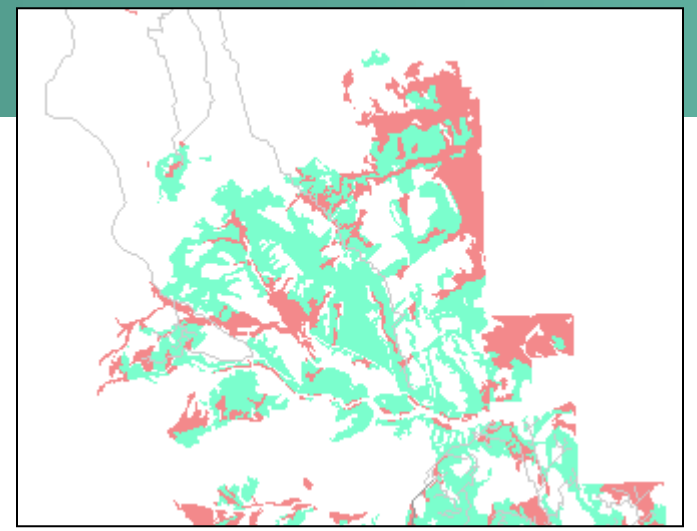
- Control using targets
  - Activity level
  - Landbase condition
    - Age class
    - Seral Stages using Natural Range of Variation (NRV)
    - Caribou
    - Songbirds
    - ECA for watersheds
    - Other NTA and wildlife
  - Spatial distribution
    - Harvest activity
    - Old seral stage
  - Zones
    - Go or no go zones for different management regimes
  - Operational
    - Road Costs and log size

Patch Sizes

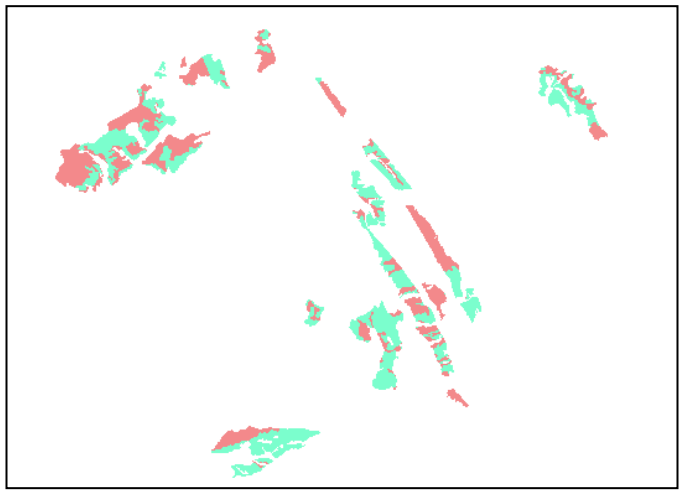
- Defined as polygons with similar characteristics within a certain distance from each other.
  - Recent harvest
  - Older forest
  - Wildlife habitat
- Typical patch targets
  - Individual harvest blocks
  - Groups of harvest blocks in a year
  - Contiguous older forest

Patch Patterns

- What patterns are achievable?
  - Historical disturbances can limit current choices



- What landscape patterns are desired?
  - Depends on other desired values
  - Watersheds
  - Road timing
  - Wildlife habitat



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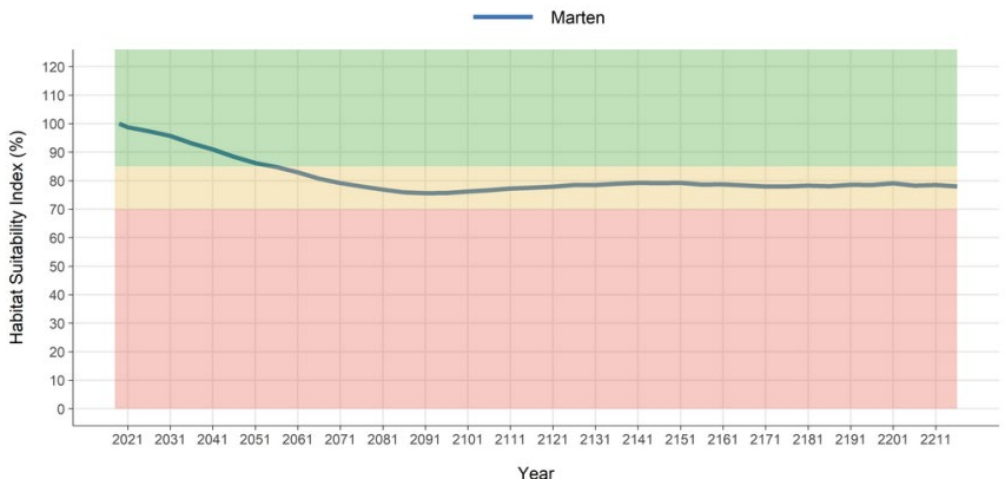
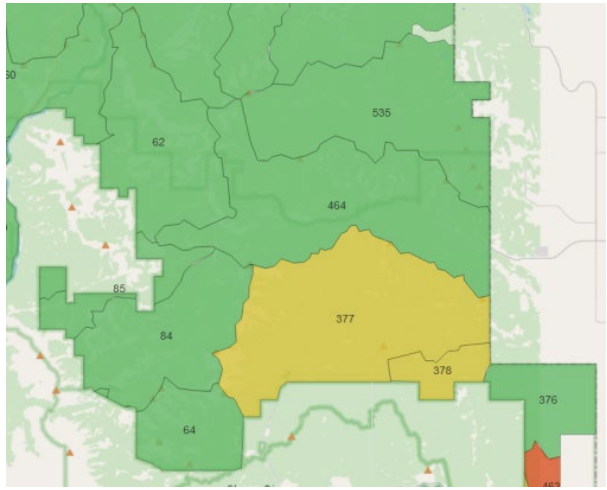
Non-Timber Values – VOIT's

- Variety of metrics are monitored and reported
- Coarse filter
  - Seral stage
  - Old forest
- Wildlife habitat
  - Caribou
  - Songbirds
  - Marten
  - Barred Owl
  - Grizzly Bear



Non-Timber Values – VOIT's

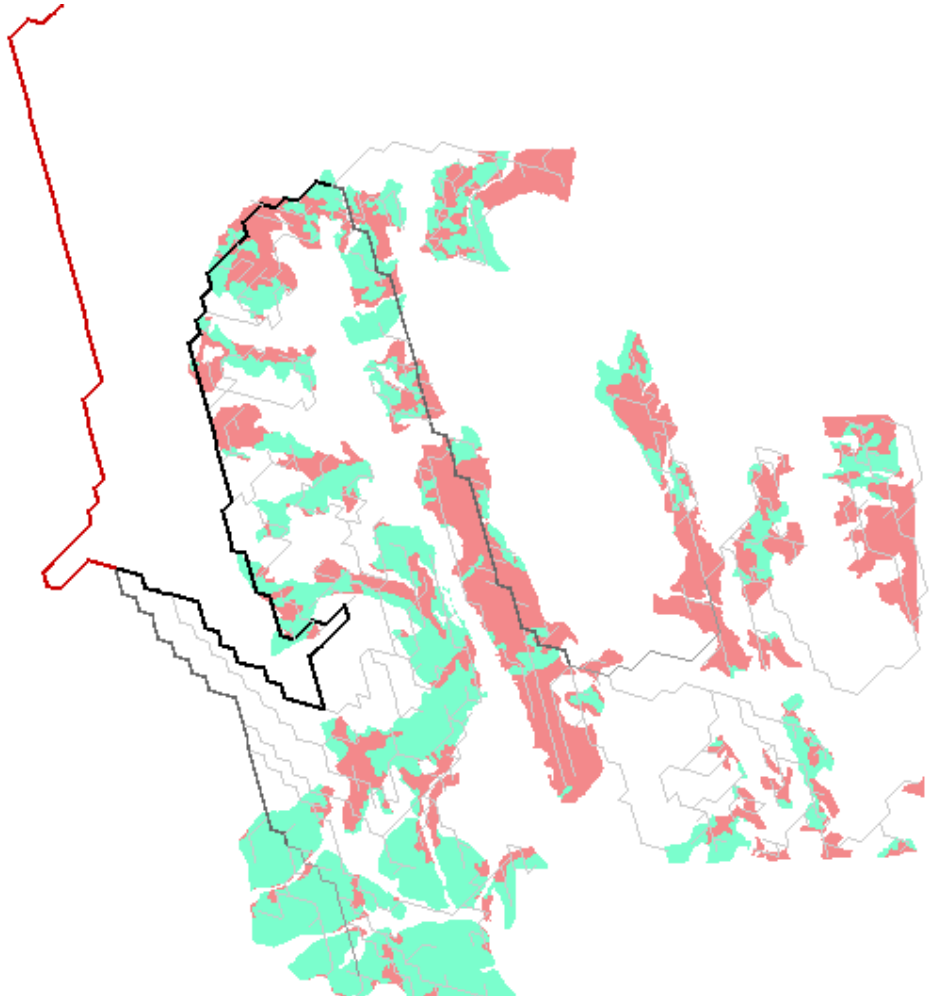
- ECA calculated for Watersheds
  - Equivalent Clearcut Area
  - Biggest impact when harvest blocks are young
  - Fire also impacts the ECA values
  - Proxy for fish habitat
  - Harvest sequence is changed to reduce impact on any given watershed.
- Road density



Operational Considerations

- Avoid steep slopes
- Avoid wetlands and stream crossings
- Determine potential roads
  - Construction costs
  - Haul costs
- Size and amount of logs
  - Varies by local conditions

Model chooses roads based on cost



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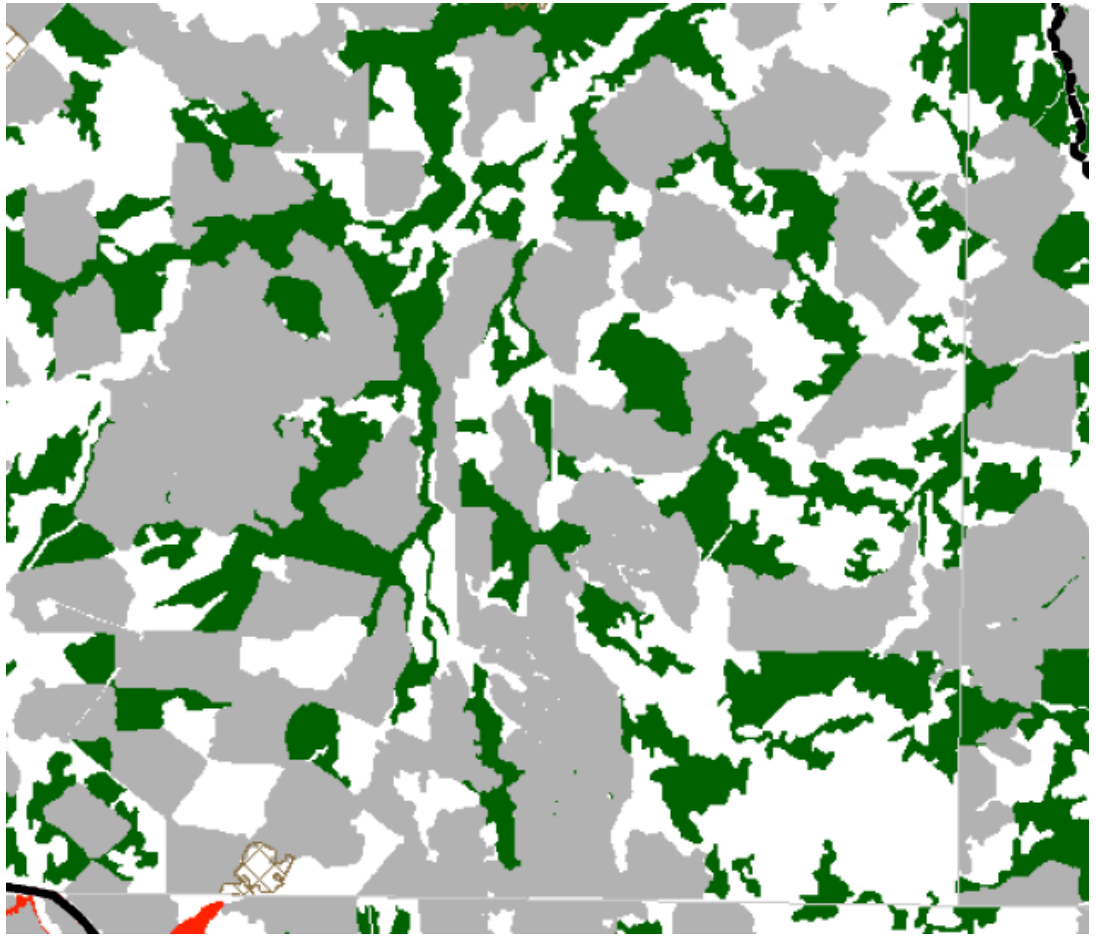
PFMS

- PFMS = Preferred Forest Management Sequence
- All metrics derived from this final sequence



Consultation

- All phases of the planning is discussed
  - Indigenous
  - Local municipalities
  - Individuals
- Use open houses, mailouts, special meetings, etc.

Stochastic Events

- Wildfire and insect outbreaks
- How is it possible to include?
  - Can predict probabilities, but…
  - Ultimately don’t know when or where it will happen
  - Only really know historical occurrences

FMP Processes for Wildfire

- Historical fire impacts are captured (implicit)
- No explicit fire loss factor is specified to address impact from future fires
- Solution = Adaptive Management
  - Continual planning (new FMP)
  - AAC trigger (2.5%)
  - Salvage & harvest sequence change

Planning Summary

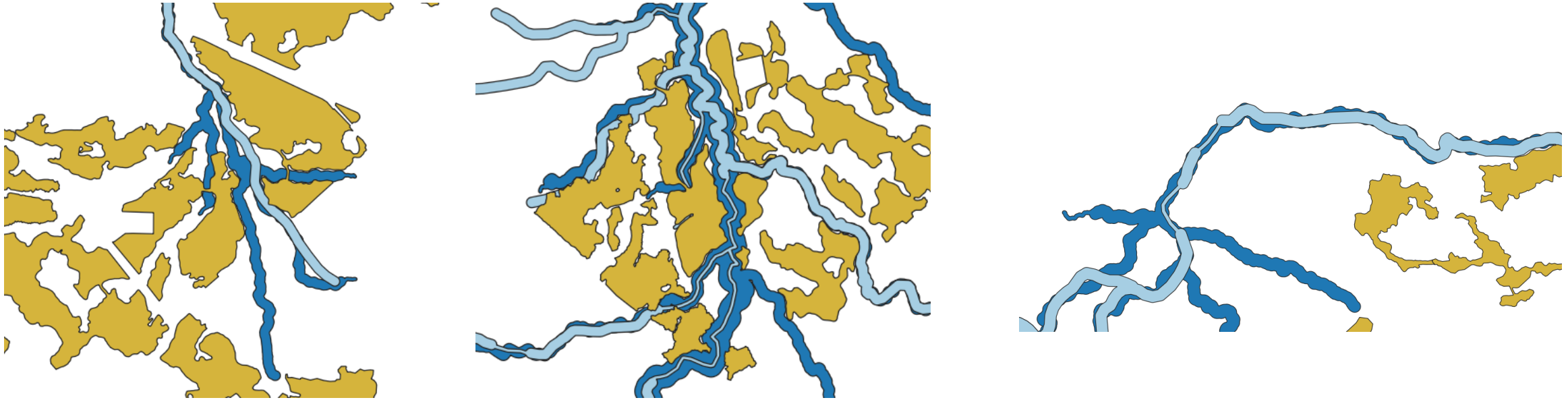
- Technical and collaborative process with many elements
  - Inventories
  - Landbase processing
  - Growth and Yield
  - Timber supply model
  - Documentation
  - Consultation
- Government Approval is required
- 200-year plan completed every 10 years

Changing Process

- FMP process is evolving
- Better data derived from Lidar and high-resolution photos
- Requirements from GoA

LiDAR derived or enhanced products

- LiDAR based watercourse data is far better than the older provincial layer
  - This example is on Canfor Grande Prairie FMA, new watercourse layer is from Terrain Works through an fRI project.

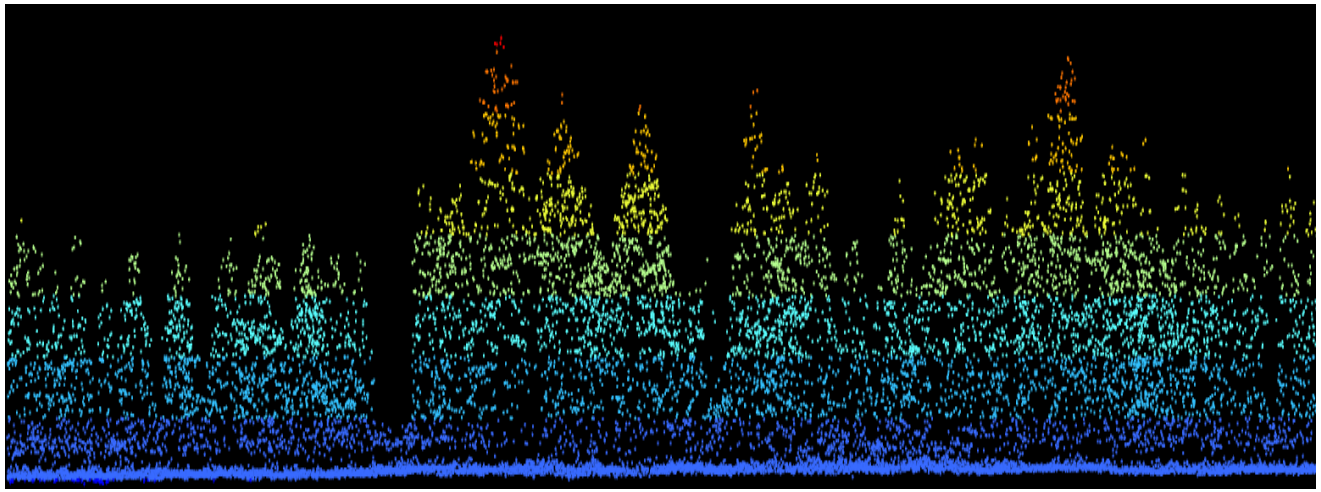


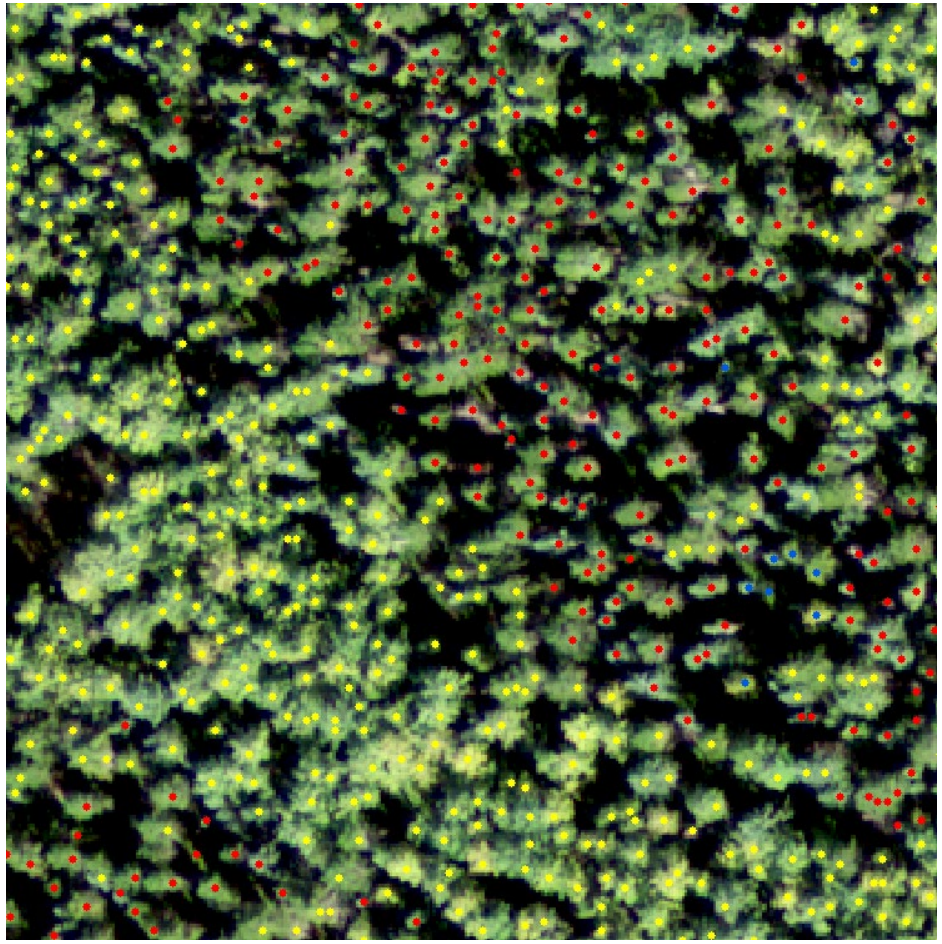
LiDAR derived or enhanced products

- Alberta Vegetation Inventory (AVI) improvements
  - Height
  - Density

LiDAR derived or enhanced products

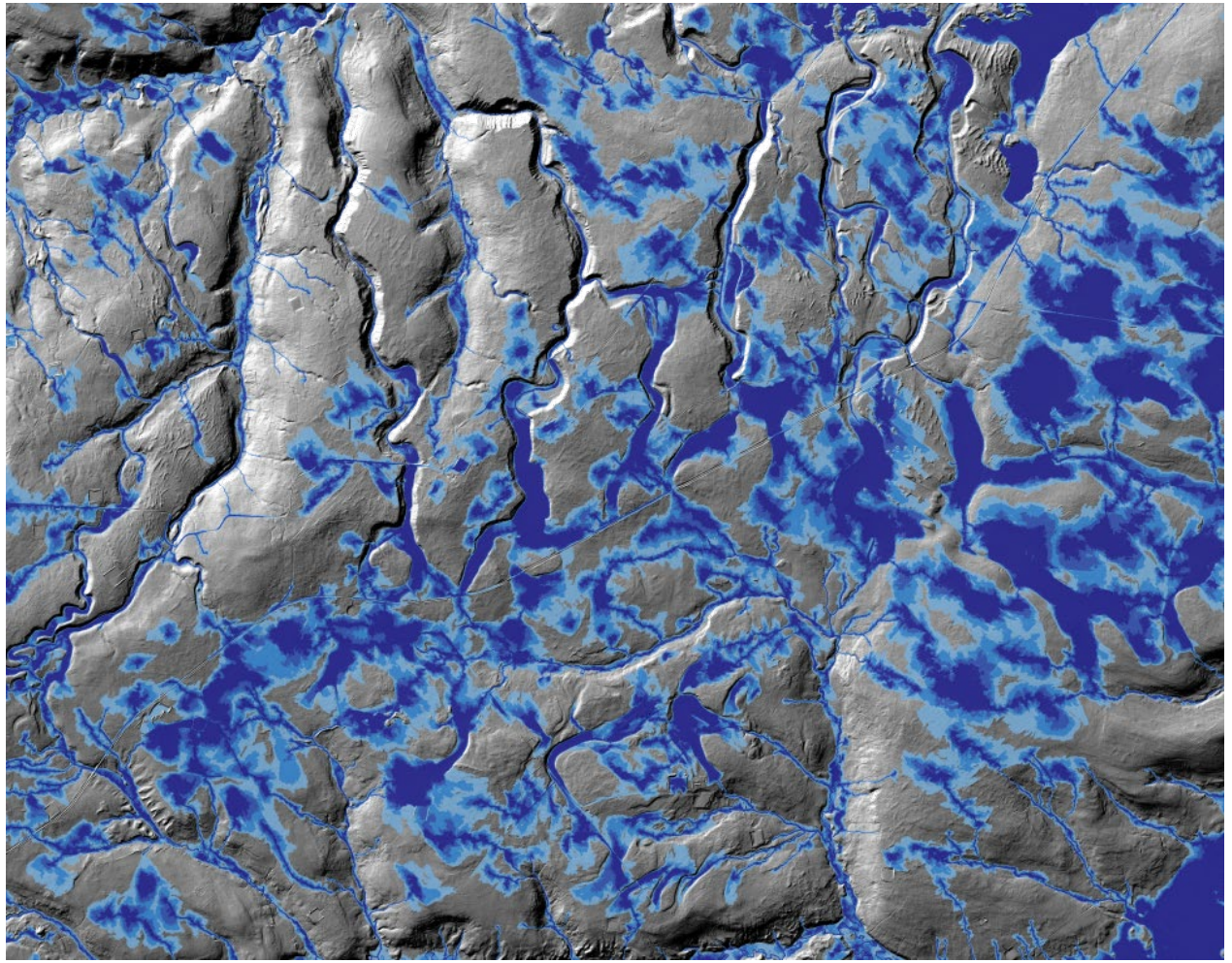
- Single Stem Inventory (SSI)





LiDAR derived or enhanced products

- Wet Areas Mapping



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Evolving Requirements

- Sub-Regional Planning – Caribou
  - Requires 500m buffer around any harvest less than 40 years old
  - Encourages grouping of harvest into small areas to allow other areas to be intact.
  - Result is some watersheds are impacted heavily and others left alone for several decades.

Evolving Requirements

- Seral stage now incorporates NRV
- NRV is Natural Range of Variation
  - Attempts to mimic fire history in amount of young, mature and old forest
  - Much discussion during the development of current FMP's on the parameters to be controlled

Evolving Requirements

- Songbird evaluation
  - Songbird models and reporting has been around for over 10 years,
  - Rules are changing on how they are to be evaluated
  - Ongoing discussion in current FMP’s.

Summary

- Combination of Technical and Regulatory analysis
- Process continues to evolve

Thank you

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