

Bipole III Transmission Project

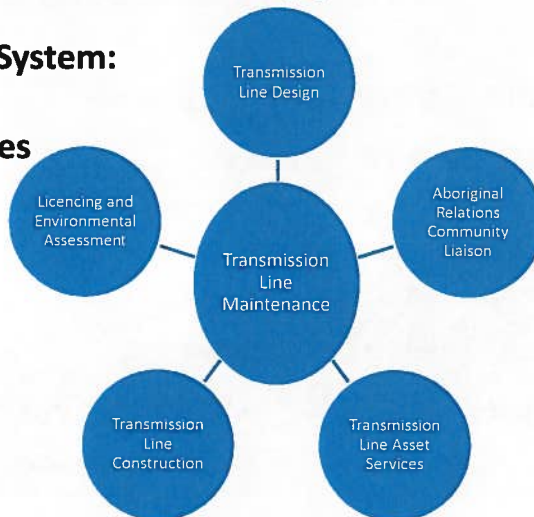
Clean Environment Commission
Transmission Line Maintenance
Vegetation Management
Wayne Ortiz



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Transmission Line Maintenance

Transmission System:
11,200 km
50,500 hectares



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Why Tree Control

- Public Safety
- Fire
- Protection of Facility
- Reliability (NERC)
- **Access for Repairs or Maintenance**



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Why Tree Control

- Public Safety
- Protection of Facility



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Why Tree Control

- **Forest Fire**



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Why Tree Control

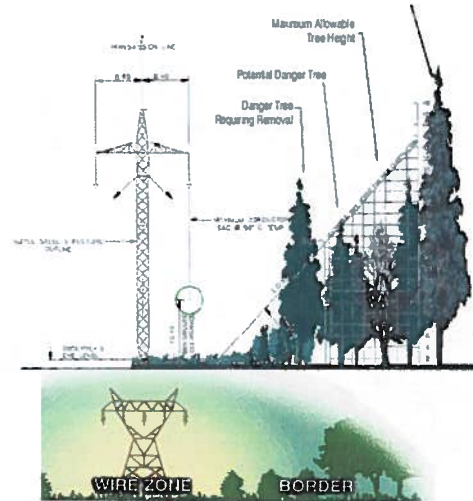
- **Reliability**

- **Blackouts caused by trees:**
 - July 1996 – Western US – 2.5 million customers
 - August 1998 – Western US – 7.5 million customers & B.C.
 - August 2003 – NE US and Canada – 50 million customers
 - September 2003 – France, Italy, Switzerland – 25 million customers
- NERC FAC-003-1 June 2007
- MB Hydro Policy to adopt standards
- MB Hydro Act Reg. 25/2012



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Transmission Line ROW Design



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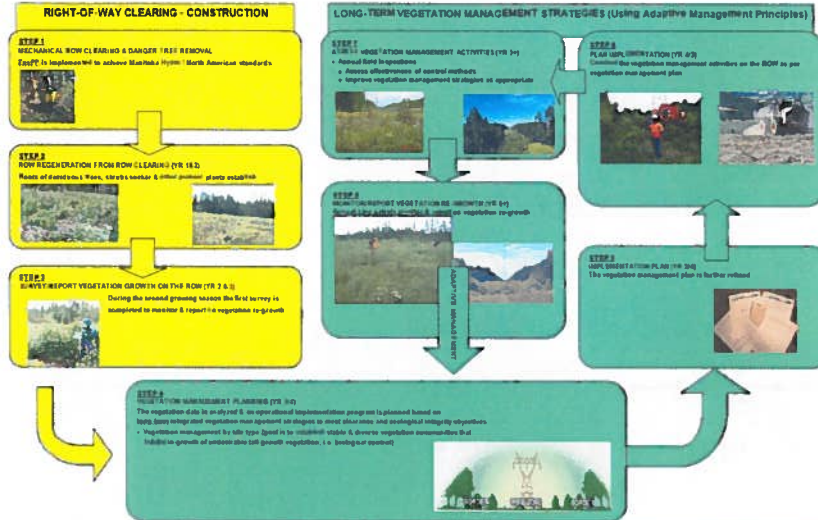
Vegetation Management Planning

- Annual Patrols identify vegetation issues
- Tree control program planning considers:
 - Target Species, size, density
 - Site Factors – terrain, access, urban/rural/remote location
 - Sensitivities & Operational Constraints:
 - Operational Environmental Protection Plans
 - Dept of Fisheries and Oceans operational statements
 - MB Conservation best practices guidelines
 - Cost of different methods/machinery
 - Landowner / stakeholder contact



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The Vegetation Management Cycle



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Tree control methods

- Mechanical Control:
 - Mechanical Mowing / Shear-blade
 - Feller Harvester
- Manual Control
 - Chainsaw
 - Brush saw / axe
 - Girdling
- Herbicide



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Mechanical Mowing / Shear-Blade

- Non-selective
- Large prime mover
 - Site restrictions
 - High fuel consumption
 - Soil disturbance
- Immediate results
- High visual impact



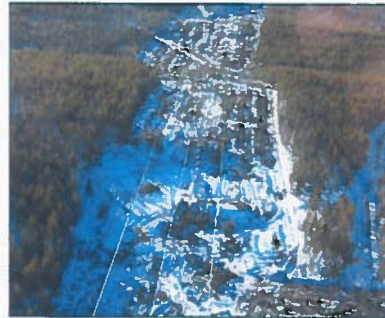
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Mowing



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Shear-Blade



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Feller - Harvester

- Large equipment
- Larger trees
- Selective clearing
 - Danger trees
 - “reach” into sensitive areas



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Feller - Harvester



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Manual cutting

- Chainsaws, brush-saws, brush axes
- Suitable for sensitive areas where machinery cannot reach:
 - Steep slopes
 - Riparian zones
 - Environmentally sensitive sites.



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Herbicide

- Pesticide Use Permit
 - Issued by MB Conservation
 - Public advertising
 - Public input mechanism
 - Specifically authorizes:
 - Which herbicides may be use
 - How they may be applied
 - Where they may be used
 - Buffer zone requirements
 - Annual reporting Requirement



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Herbicide

- Selective Herbicides – registered by Health Canada
 - Affect broadleaved plants only
 - No soil sterilants for tree control
- Selectively applied to target plants
 - Compatible plants/species left to flourish and help out-compete tree species – biological control
- Low application rates
 - Set by MB Hydro's Chief Forester annually.
- Soil permeability and depth to groundwater considerations



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Herbicide

- Licenced applicators
- Pesticide Applicators Working Group
- Reduced frequency of re-treatment
 - On the land less
 - Smaller and smaller equipment - backpacks



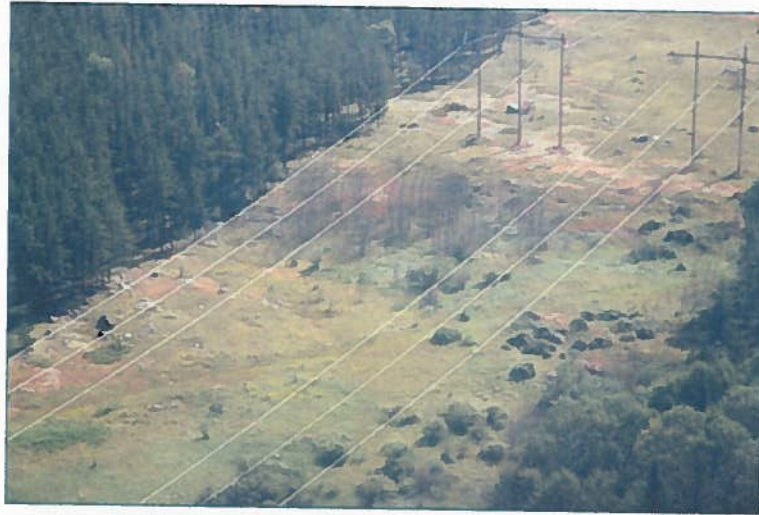
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Herbicide



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Herbicide



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Herbicide



- Set-Backs
 - Water areas – 30 meters standard
 - Sensitive sites (berries, rare plants etc.)



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Results

- Mechanical Control
 - High density areas
 - Non-selective
 - Encourages suckering of incompatible species
 - Lowers species diversity – suckering species dominate
 - Steady or shortening return cycle
 - Re-sprouting increases with each treatment.
 - More frequent environmental impact.
 - Large equipment
 - High fuel usage – increased emissions



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Results



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Results



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Results

- Herbicide
 - Selective application
 - Develop wire-zone / border zones communities with compatible species – biological control
 - Increase species diversity
 - Lengthening return cycles
 - On the land less often with smaller and smaller equipment (backpacks)
 - Increased competition from compatible non-tree species
 - Reduced tree invasion
 - Lower fuel consumption



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Results



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Continuous improvement

- Follow-up surveys
- Ongoing patrols assess results of treatments
- Annual patrols follow future tree growth
- Results of past practices are modified as part of the following vegetation management cycle.



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Thank-you



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