Challenges of meeting new Regional Water Quality requirements in Harvesting Operations.

Peter Weir
Chair NZFOA Environment Committee
NZ Forest Owners rep on Land and Water Forum

Steep Slopes Wood Harvest Conf. Nov 2013

Acknowledgement

MPI’s Sustainable Land Management & Climate Change programme - funding of a Forestry Harvesting Benchmarking Trip:

- Chile – Forest Harvesting practices.
- Western Europe (Germany, Italy & Switzerland) - Protection Forests & Debris Flow management

Dzhamal of Scion for organisation & logistics
This Presentation

• Land and Water Forum
  – Acknowledge widespread public & iwi concern about freshwater degradation in NZ

• National Policy Statement on Freshwater - RMA
  – National Objectives Framework (water quality)
  – PCE report on land use (Dairy Intensification)

• Benchmarking trip to Chile & Europe
  – Spencer Hill & Rodrigo Palazuelos: Chilean Wood Harvesting Operations on Steeper Terrain

• What does the future hold in NZ?

Civil Society – very concerned about state of NZ’s fresh water

NZ Environmental Defence Society:

Trouble in Paradise

Conflict in Paradise
Brand NZ damage

• Multi-stakeholder small working group: 23 reps from NZ’s primary land use sectors, 5 (big) Iwi, ENGOs, Hydro & irrigation, plus Regional Council active observers, answering to a plenary of 68 organisations.

• 2+ years: 78 Recommendations for Govt to reshape the governance & regulation of freshwater (and land use) in NZ.
Early on: Concerns on the state of the Waikato River

Read Team Green’s body language

Primary Sector
“Team Green”

Regional Issues - Team Iwi - effects of conversion of plantations to dairy pasture.

Water Quality

Land & Water Forum recommendations:

• Govt to set National bottom line limits for contaminants (Nitrate, Phosphate, bugs (E.coli) & SEDIMENT).
• Regional Councils to facilitate community of interest (catchment based) collaborative multi-stakeholder processes, to define local objectives for water quality (Very Good, Good, or Fair) and time lines to get there (perhaps Generational).
• Regional Councils to change Water Plans to reflect agreed community aspirations for freshwater.

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Recommends a policy mix of carrot & sticks

Bay of Plenty Regional Council: Approved Forestry Operator scheme

2. (New) Freshwater Objectives Framework – Nov 2013

Proposed amendments to the National Policy Statement for Freshwater Management 2011
### Contact Recreation (swim & fish) – Rivers & Lakes

<table>
<thead>
<tr>
<th>Value</th>
<th>Attribute State</th>
<th>Numeric Attribute State</th>
<th>Narrative Attribute State</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Very Good</td>
<td>SRFG</td>
<td>Water-quality tests and assessment of potential contamination sources indicate recreational beaches have very low risk of infection. The beach is considered satisfactory for contact recreation at all times.</td>
</tr>
<tr>
<td>B</td>
<td>Good</td>
<td></td>
<td>Water-quality tests and assessment of potential contamination sources indicate recreational beaches generally have low risk of infection. The beach is satisfactory for contact recreation most of the time. Exceptions may include following rainfall.</td>
</tr>
<tr>
<td>C</td>
<td>Fair</td>
<td></td>
<td>Water-quality tests and assessment of potential contamination sources indicate recreational beaches within this category have a moderate risk of infection. The beach is generally satisfactory for contact recreation, though there are potential contamination sources. Caution should be taken during periods of high rainfall, and contact recreation avoided if water is discoloured.</td>
</tr>
<tr>
<td>D</td>
<td>Poor/Very poor</td>
<td></td>
<td>Water-quality tests and assessment of potential contamination sources indicate contact recreation beaches within this category are considered to have high risk of infection. Beaches are generally not okay for contact recreation, particularly by the very young, the very old and those with compromised immunity.</td>
</tr>
</tbody>
</table>

### (Last week)

**Water quality in New Zealand:**

*Land use and nutrient pollution*
Media reaction to PCE report:

- Dairy intensification 'killing NZ fast and dirty'

- Another day. Another dire report for dairying and its impact on the environment.

- It was like a neutron bomb going off in the heart of New Zealand's economic strategy. Bernard Hickey (NZ Herald)
Forest Growing looking good..<br><em>Or is it? - Sediment</em>

Our hillsides are being scarred by poor forest harvesting - <em>Prof Dick Bellamy</em>: Jun 18, 2010

Forest plantation harvesting is in desperate need of improvement.
RMA & Regional Water Plans

In NZ, harvesting often under **Permitted Activity Rules** (subject to a Plans **Terms & Conditions**), but if contractor can’t meet these, then typically **3 Resource Consents** are needed:

- Earthworks -roads & landings (Land use Consent)
- Vegetation disturbance (Land use Consent)
- Discharge sediment laden runoff to land and to water (**Permission to pollute** - stormwater)

BUT under the Govt’s NPS on Freshwater, a Council cannot issue a discharge (or water take) consent if a river is already “Over-allocated” – eg polluted by sediment.

Otago Region – recent Plan change introduces very stringent Permitted Activity limits for Sediment

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**Meanwhile** MPI Benchmarking Project

- Undertake a review of national and international practice on **alternative harvesting and forest management approaches for risk management on steep hill country** (to reduce the incidence of post harvest landslides & debris flows).
The “Problem” (according to MPI, 2013)

• Of New Zealand’s total forest estate (1.77 million ha) at least 45% is on steep terrain (>19° slope).
• More than 50% of the land that is to be harvested in the next 10 to 15 years, with a significant proportion on Land Class 7e - “Red Zoned” ie highly susceptible to erosion after harvest (MfE ESC mapping).

Chile – Mininco & Arauco

• Visited Los Angeles & Valdivia
• [www.forestalmininco.cl](http://www.forestalmininco.cl)
• [www.arauco.cl](http://www.arauco.cl)
  — Both large integrated companies (family owned), together growing & harvesting as much as all of NZ (24 million tonnes/year, and increasing).
Los Angeles, Chile (Mininco)

Some highly erodible geology (similar to Nelson’s Separation Point granites or BoP ash)
Harvesting some very steep ground (45 deg)
Notofagus remnants retained in riparians

Riparian protection (FSC driven)
Chilean Forest Code specifies:
- Small incised streams: 5m if < 30%, 10m if 30 to 45%, 15m where > 45%.
Agreed 10 & 20m setbacks with stakeholders (FSC)

Forest Roading (Mininco)
– better than NZ

UDAR DTM’s with 2m contours available to Forest Engineers & Harvest Planners
Linear optimisation program used to locate landings on new roads (optimised for yarding distance)
- Small landings (90x15) ⇒ less soil moved / less fill.
- Company upgrades public highways prior to logging, Dust suppression outside houses in rural areas
- Higher axle loads (5 axels, only 2 on trailers)
- Small yarders typically haul 200 to 400m, require high road density (>5 km per km²).
  ⇒ More mid slope roads
- Mininco’s roads very high standards (Civil construction – QA via CBR). Winter roads @ US$70K/km, summer roads US$20/km
- Running course optimised by carting in clay to blend with quarried rock. Water carts & Vibratory compaction everywhere.
Good House Keeping and Good H&S systems - safety audit every 2 weeks
Arauco very focused on minimising site disturbance

Residue management: (Arauco, Valdivia).

- Very little mud in slash on birds-nests (attributable to metalled landings?)
- Don’t get birds-nest collapses
- Managing for Visual Impacts
- Experimenting with Hauling from bottom first to minimise soil disturbance (greater risk for breaker-outs?)
Black Forest, Germany – minimal site disturbance

Riparians common and protected

Chilean - Harvesting
Machines with Traction Winches operating on slopes up to 37°

Stumps recut close to ground level to facilitate machine passage

German research shows steep land harvest sediment yield below detection limits

Similar NZ research at Whangapoua (Phillips, et al, 2000) showed erosion rates of 70 to 590kg/ha/yr, with sediment delivery rations to streams of 0.1 to 0.9
Small coupe harvest – primarily for forest heath (Spruce bark beetle)
€40 / m³

Contractors qualify for EU Rural Development Grant: 40% to max of €1 mill per piece of kit.
Now gone (Global financial crisis)

Slope hazards & communities at risk

– Had deforested their land in past century’s
– Runoff from mountain instant
– Huge amount of research aimed at this issue
– Very good understanding

www.ernslaw.co.nz
Ultra Low impact logging (CHF 75/m³ = NZ$100/m³), Large piece size

Memorable Quotes (Europe):
Who is your logger – Attila the Hun?
**MPI SLM&CC project – Takeaway messages:**

- Chile hasn’t got the combination of thin soils & heavy rainfall to trigger landslides (except in Andes).
- Chile doing much more to minimise soil disturbance, leaving no stems on slopes and don’t haul through any headwater stream - so much less residue available to become entrained in debris flows (not that they have them).
- Chile – Harvest practices likely to produce better water quality than NZ. (Germany, Italy & Switzerland much better).
- **NZ can do better**
- In NZ, landslides producing destructive debris flows are almost inevitable after clearfell harvest of radiata on Class 7 (Extremely Erosion prone) land, and will become more frequent as climate changes (NIWA predictions)
- **No Silver bullet**

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**We need more emphasis on erosion & sediment control during & after harvest**

- Care around streams, especially in Ground based ops.
- Better protection of riparian corridors.
- Emerging: the “Pre-bunch & Grapple” challenge:
  - Must avoid track slip (rutting) in heavy winched machine operations on steep slope (operator training?)
  - Intermediate supports in cable on sensitive soils?
Better matching of machines to soil type (Ground Pressure vs. Bearing Capacity)

The way forward - Better gear & increased operator awareness (training). More care.

Changes to RMA may see fines for sediment discharges increasing to $1.5 million.