

**Wise Response Seminar on Integrated Landscape Management  
13 November 2017; (1.30 - 4.30pm)**

**Centre for Sustainability, Otago University**

**Present:**

Bethanne Jackson, James Renwick, (VUW); Dugald MacTavish, Alan Mark, Will Anglin, Jocelyn Harris, Pat Scott, Liz Slooten, Nathan Surendran (Wise Response); Alex McMillan (Public Health); Rhys Millar (Halo Project), Gretchen Robertson (1st hour), Rachel Ozanne (ORC); Junichi Sukishita, Luke McKinlay, Mandy Tocher (DCC); Mark Fitzpatrick (Ravensdown), Frank Griffin, James Hale (Ag Otago); Colin Campbell-Hunt; Aubrey Miller, Craig McDonnell (OU Surveying),

**1. Alan Mark: History of Wise Response**

- Dunedin-based, but New Zealand-wide; 5 main planks to holistic platform; comprehensive expertise
- activities include petition to Parliament (2014), requesting risk assessment to avert future problems
- government of day said concerns adequately covered; no action required but all 3 minor parties endorsed the submission
- since then, WR active with submissions, workshops, getting NGO consensus on climate change
- consensus document submitted to Parliament, via Kennedy Graham, chair of GLOBE-NZ cross-party C/C committee
- document to be presented to new government shortly, when things settle down
- politically active; 100 reputable supporters NZ-wide
- 100+ organisations; 300,000 individuals on board for the Climate Consensus Coalition Aotearoa statement.

**2. Nathan Surendran: A context: critical issues for WR relevant to land-use**

- see Power-point presentation
- energy can't restart growth
- recoverable energy in decline; ceases to be cost-effective
- considerable energy in ground, but not cheaply exploitable, or eventually at all
- photovoltaics & wind turbines cost more than oil & gas
- increasing costs due to C/C
- massive costs in transition to solar
- optimism impossible when future energy constrained
- energy squeeze 2035–2040
- radical simplification the only solution.

**3. Alan Mark: Scope for & potential of an integrated landscape approach to address emerging issues & risks**

- see Power-point presentation
- water yield studies in Otago upland from snow tussock, mainly on upper slopes
- snow tussock recovers 65–80% of water. Surprising!

- efficient in trapping water from fog; half-litre per hour per tussock
- traps water & snow, so efficient ground cover in terms of water yield
- cf. pine plantations, 41% reduction in water yield in year 22
- pines a problem, so prefer tussock grassland in the uplands
- tussock should be protected for water yield, recreation, biodiversity, landscape values
- visiting ecologist found similar result from Andes
- visitor reported procedures in place to encourage upland protection; income of inhabitants from compensation paid by those who benefit further down catchment
- in NZ, Taieri catchment a good start; time to revive.

#### **Dugald MacTavish: Scoping the potential for an integrated process for reducing risk**

- see Power-point presentation
- risks from C/C; fuel shocks; shortage of oil derivatives (e.g. plastics); loss of ecosystem; market volatility
- history of land-use transition from nature > degradation > urban
- light > extensive > intensive
- land-use impacts on carbon in soil; cultivation reduces carbon; difficult to recover
- benefits of enhanced incorporation of carbon in soils/landuse
- need to identify “common concern” as entry point
- zero net carbon by 2050 now Govt policy which implies C budget limit
- To meet it the budget will need to be distributed round different sectors (e.g. transport, agriculture)
- So carbon good "common concern" indicator
- physiographic mapping of water quality in Southland is form of ILM but so far limited to water quality outcomes and not more fundamental issues of sustainability
- Example of scope for ILM: planning failures in Taieri hydrology, where understanding of location of North Taieri recharge zone and capping zone provides opportunity to minimise contamination risk
- but gravel pits and abandoned landfills in recharge zone = potential polluters
- And drains pump nutrient rich surface drainate into Lake Waihola
- development in North Taieri threatens versatile soils, missed opportunity.

#### **4. Will Anglin: A legal viewpoint on integration in ILM**

- see Power-point presentation
- engineer, lawyer for WR
- role of RMA in integrated land management
- district plans > regional > national > RMA
- but subject to interpretation
- evolution of policy statement
- WR & others engaged in mediation this year; complicated, takes time & energy
- role of councils under RMA *passive*
- can enable, not direct
- case law: Judge Jackson said “justified reasonable regulation ... the proposed policy was not reasonable”
- shows can be interpreted

- proposed Otago Regional Policy Statement doing quite well
- prospect of management good; more attention to ILM
- helpful if stakeholders such as conservationists contribute to process early on, prior to notification

**Q:** management of physical nature & environment rather than people?

**A:** environment *includes* people and their values; sustainable development for *people*.

### **5. Alex MacMillan: A public health perspective on ILM & a participatory approach**

- senior lecturer environmental health
- links between urban environment & health
- public health = not absence disease, but holistic view; well-being, air, water, environment, policies
- because of C/C, emerging parts to human health include sustainability, more bugs, infections, over-use of antibiotics
- so work with vets, ecologists
- Margot Parkes leading thinker on relations between ecosystem & health
- interlinked health crises include water, air, plastic, & nitrates
- ILM integration of stakeholder inputs or outcomes? Alex says outcomes
- complex interactions, e.g. fresh water & C/C
- more microbes, nitrate buildups, algae, pushed by more rain into catchments
- see camphylobacter outbreak
- = food production under neoliberalism
- single-product economy > problems, e.g. mental health in farmers (debt, resilience)
- therefore transport, housing urban policies need to start with *values* of well-being, including environmental well-being
- find *common ground* among stakeholders; find solutions to complex problems
- understanding ILM requires participatory exercise
- C/C can activate people, but as threat, paralyses people
- framed as health & well-being > people more engaged
- Arnold Schwarzenegger says health can activate people better than dolphins or polar bears
- e.g. fresh water issue in recent NZ election.

**Q:** advice from public health about reaching wider audience?

**A:** in NZ & globally, health NGOs in closer relationship with environmental NGOs on quality of life & children's well-being

**Q:** more needed from government?

**A:** more agreement on C/C policy, water, & environment needed. RMA problematic: mentions well-being, but not in legislation about impact, so = tokenism. Well-being now out of local government policies.

### **6. Rhys Millar: The Halo Project: beyond the Orokonui example**

- see Power-point presentation
- 55,000 hectares
- aim to create healthy landscapes supporting resilient communities

- 4 project goals rely on farmers' input, as mostly agricultural land
- structure chaired by Jinty MacTavish
- biodiversity, predator management in Halo Project for sake of communities
- stoat incursion into Orokonui (loss of saddleback) + TB outbreak just outside fences
- needed to build on local skills, empowerment, trust
- protect 400 hectares round Orokonui + respond to desire for biodiversity in back yards
- therefore delivering eradication TB & possums in urban settings as well
- systems of communication via participation & empowerment; connect rural & urban
- coastal forest restoration with farmers between Seacliff & Karitane where no regrowth
- non-threatening, low-key approach includes burn monitoring, offer of technical resources, individual farm management projects, & restoration of corridors
- bigger picture = catching planning process
- softly, softly, "source to sea" education projects for urbanites *and* farmers.

## 7. Craig MacDonell (+ Aubrey Millar), Dept. of Surveying

- see Power-point presentation
- why use GIS?
- manage, analyse, & visualise spatial data
- what, where, why?
- interactions society, ecology, & physical space, e.g. John Snow & cholera
- create multidimensional data & earthquake maps, using drones flying over same ground multiple times
- maps bring people together, start conversations
- e.g. focus on area in Upper Clutha catchment
- different levels: vegetation, soil, drainage, soil PH, elevation, slope, stream networks, catchments
- spatial data mining *or* specific questions possible, e.g. trees, especially older ones by location and well-drained soils

**Q:** Can you confirm what the map tells you?

**A:** Yes.

**Q:** Variation?

**A:** 88% hit rate.

**Q:** What's photogrammetry?

**A:** overlapping drone photos, triangulating measurements with points on ground.

## 8. James Renwick (NIWA): Climate & ILM

- see Power-point presentation
- "climate disruption" rather than "climate change"
- opportunities to empower people v. frightening them
- but need to explain possible consequences
- global surface temperatures only 2% of story; rest of effect falls in oceans
- to end September 2017, one of 3 warmest years on record
- rate of warming increasing rapidly

- now not far from 1.5° increase, so where to from here?
- in future, anything is possible
- if keep to Paris agreement, could be only 2° increase, but needs really significant reductions
- if carry on till readily available stuff burned, 4–10° increase within 100 years
- lots of leeway via politics; heartening to hear of zero emissions by 2050
- but more extreme events will occur
- if 1° warmer in next 100 years > 2° warming > different climate state
- now 1–2° above pre-industrial rates
- after 2040, *every year* will be warmer than warmest so far
- current climate warmer for longer than we can estimate (1400–thousands of years)
- *Sydney Morning Herald* warns of 50° temperatures in Sydney & Melbourne
- unprecedented temperatures fairly soon; hurricanes now; super-high temps in India
- NZ quite temperate, but unusual extremes will come
- 2° warming > tripling of hot (30°) days
- 5–10% less rain > 3 X droughts > 4–6 months extreme fire danger, especially in east from Balclutha to Port Hills, East Coast to Northland
- glaciers gone by end century
- increased flooding (see Edgecumbe); 2–3 X occurrences of major flooding
- dry gets drier; wet gets wetter
- + extreme weather events
- % change in surface runoff affects availability of water
- already visible, e.g. salmon in dwindling streams in US; more wildfires in Canada, US, Europe; water conflicts (Sudan, hardest drought in 1000 years)
- map shows NZ as brown North Island, blue South, but really West Coast v. East
- **Conclusion:** warming this century 1° > 2° > 3° > ?°
- further change already locked in: sea-level rise (last 140 years, 25 cm rise, same again next 50 years), floods, heat
- human society has developed in time of stasis; no longer the case
- “driving the car & only looking in the rear-view mirror” (Judy Lawrence, Berkeley)
- factor all this in land management when major stresses on land management
- agricultural sector adaptable, room to move, as new crops & approaches develop
- but hard for natural ecosystems; will really struggle to survive.

## 9. Bethanna Jackson, senior lecturer, School of Geography, Environment, and Earth Sciences (Victoria): ILM initiatives elsewhere & approaches we might consider

- see Power-point presentation
- LUCI = tool for modelling multiple ecosystems
- services at the farm, catchments, regional & national scales
- some progress, but time-scale scary
- background = work in Wales
- shelter-belts and hedges ripped out; now subsidies to put back because of more flash floods, degradation, landslips, increased sedimentation
- at first, farmers said too costly, show us the benefits; now seeing advantages (ducks)
- interdisciplinary scientists worked on project
- importance of landscape organisation & models
- interactive scenarios; priorities in real time

- can generate models on national scale
- therefore, outcomes & policies both regional & national
- GIS helpful in searching for win-win solutions
- aim: to value elements already existing in landscape, then identify where intervention would be useful
- identify trade-offs & synergies via maps
- more organic carbon > more permeable soil > storage capacities > flood mitigation
- but watch out for sedimentation transport
- flood v. farm tradeoffs; losing v. sequestering
- biodiversity not currently subsidised
- in Wales, corridors for species to respond to C/C
- important to consider “hostility” of surrounding areas
- mapping Wales by LUCI; wants to do the same for NZ
- LUCI = 4-year project; big data; 5m X 5 m; subfield level detail
- ability to change scenarios
- international recognition: Bagstad looks at generalisable examples
- fine spatial scale at landscape & subfield levels unique
- UN also picks up
- will take 10 years to write reports
- services currently modelled by LUCI
- excited about potential for habitat approaches
- how to make decisions?
- optimisation of routines so users can choose
- LUCI in NZ: Waituna, Ravensdown; other countries too
- farm scale applications
- farmers now focused on water quality: sediment, nutrients, optimisation routines
- offer opportunities rather than telling people what to do
- maps of (e.g.) water-bodies, environmental impacts
- seek collaborations
- predictions possible, e.g. boggy bits
- attention to cultural valued landscapes, e.g. where water for crops derives from battle-grounds
- cf. Wales, historic landscapes, peat protection
- data sets underpin projections
- maps great for engagement, but also numbers, graphs, tables
- has stewardship programme worked?
- spatially explicit modelling shows benefits.

**Discussion Q1: To effectively achieve integrated management of resources, does it imply the need for a structured approach at scale like ILM?**

**Q:** How to get to “optimise”? Model trade-offs?

**Jackson:** yes, as win-win. Integrated management > managing increased production & nitrates

**Q:** volume or value in agricultural production?

**Jackson:** sometimes good idea to de-stock (Alison Dewes); better return = trade-offs. Working to build them in; some just started.

**Q:** Crude measure of productivity?

**Jackson:** doesn't matter for framework of models, but yes on ground. Initial project in Wales produced good analysis that de-intensifying is beneficial, but farmer sees less money coming in.

**Q:** How to work with farmers?

**Jackson:** multiple scales playing out, e.g. food/energy nexus; catchments; different countries.

**Q:** How to assess adequately?

**Jackson:** LUCI does a fantastic job asking questions, but when multiple objectives, which ball to catch? So choose tools, scale/scales, depending on question. Participatory policy-making, not too small/local, not too big/national. Transport & housing regional. People need to feel they have a stake, input into policy. Upland farmers divided from lowland ones, but *both* have a stake. Scale needs to be qualified, made appropriate to issue.

**Mark:** e.g. trade-off between water-run v. carbon sequestration in pine plantations.

**Anglin:** new legal approach goes beyond "passivity." Councils take direction for government, so really "passive"? DCC gives substance to RMA. Policies, but how to do it? To a degree ambiguous, e.g. target of 97% renewables. Competition for irrigation, so not enough hydro left to reach targets of national policy statements; locals currently decide. Not enough wind developed last 5–6 years. Economic incentives at Waitati declined on grounds of landscape amenity. So tackle at issue level; complications inevitable.

**Jackson:** start larger & work way down. Multiple scales essential > *appropriate* scales.

**Q:** how to create action on ground? Farmers don't necessarily connect to issues at play on larger scale, e.g. irrigation. Small groups > more ownership. Neighbours watch; catchment becomes group scale.

## **Discussion Q2: What issues & opportunities do we foresee in ILM?**

**Q:** should C/C be main concern?

**A:** Tim Groser said it's not what's keeping people awake at night.

**Slooten:** they will when they can't sail their boats. "Common concern" should be values-based. If hook = water, affects farmers but city people too.

**Q:** common? But *diversity* of concerns. How to capture?

**MacMillan:** in housing work, people come for different reasons, but shared values are inter-related., e.g. energy efficiency in relation to poverty. Could make decisions about trade-offs. Urban environments too, e.g. retreat from low-lying areas affecting whole populations, not just rural. Trade-offs, but where to move to?

**Millar:** at Orokonui, started involving landowners with counting birds, i.e. built trust from biodiversity perspective. Socialization in non-threatening manner > before more important things.

**Q:** taking too long? 20–30 years?

**Millar:** start with trusting relationship. Not just regulations but willingness to act in absence of regulations. Can't wait for revision of RMA. Farmer groups rising up; see opportunities for community & selves.

**Q:** aspects of health & well-being?

**Jackson (?):** yes. In water conference, Maori & farmer input, concerns almost identical. N X quantities of water don't matter beside visible bog in valley bottom. Hard to be interested in other people's welfare, so solution is *trust*.

**Slooten:** more examples on model Orokonui? With decline of DOC funding, locals doing the work.

**Jackson:** scale varies, dependent on issues.

**Q:** "common concern" too hard? Sector interests?

**Millar:** ORC focuses on landscape management. Outcomes of common concerns, e.g. riparian margins, carbon sequestration, addressing common values & benefits.

**Jackson:** define common benefits by multi-solving.

**Q3: Given ILM's community-wide implications, how would that breadth of support be secured within the necessary time-frame? (i.e. asap).**

**Millar:** Orokonui already has support of scientists, + community priorities. Started not with imperative from RMA, but counting birds.

**Pat Scott:** excellent work of regional councils on invasive weeds; incredible support; farmers not necessarily hostile. ORC 2000–2005, huge uptake from farmers.

**Colin Campbell-Hunt :** perhaps identify *goals* rather than *concerns*; knowing where we want to get to.

**MacTavish:** Yes, backcasting essential if we are to reach goals. If plane goes at 3pm, no use getting there at 3:10 (quote from Bob Lloyd). Trouble is, we are going so fast under neo-liberalist economics & market thinking. Now we are saying no. *Goals* = everything you can sign up to, then go more broadly, with constant communication

**MacMillan:** everyone concerned with *health*.

**Colin Campbell-Hunt:** nitrate smoothies!

**Q:** regulation and education too slow?

**MacMillan:** Nicki Harre talks about “communicating flourishing,” i.e. make clear opportunities to flourish; show pathways. Care of common home, not escape to Mars. Resource depletion & energy management. Classic problem = talking about getting people together, but what about those not born yet? We are only a tiny fraction of people in future.

**MacTavish:** on evidence promising a "flourishing" future would be a lie.

**MacMillan:** every generation lives by its lies/myths. Is that so bad?

**Q4: How to ensure the ILM was grounded in real biophysical imperatives (e.g. safe emissions & renewables), and continues so?**

**Mark:** we know the biophysical consequences already. Fair assumption that future people would like a livable planet. Continual population growth & finite resources *force* us into ILM.

**Renwick:** ICCP makes assumptions about continuous growth, resource depletion. Ecological economics seen as optionable.

**Surendren:** Energy depletion *happening*, & *will* happen. 5 stages of grief > adaptive response, i.e. must use less: 20% > 10% of current energy, e.g. by local food production.

**Campbell-Hunt:** how? Double votes for 5-year olds!

**Q5" Is it worth pursuing and ILM approach further and if so, how? By whom**

**Mark:** Let's run a similar seminar for catchment groups in Southland. Cf. Land & Water Forum, 500 submissions from farmers. Have to come up with drought suggestions.

**Nathan Surendran:** would welcome workshop in Southland.

**MacTavish:** role of councils? Ecan planning on water using Zone Committee a model?; something could be done in Southland.

**Jackson:** Waikato & sub-catchment groups. Have heard about tools & issues, so how to act on them? Stress co-benefits?

**Alan Mark summarises the Seminar:**

- issues, challenges, opportunities
- 10 papers, 27 people in today's seminar
- questions from terrestrial ecology perspective include water, sediment, modeling biodiversity (pathways for restoration & recovery of endemic species), mitigation, community efforts, e.g. predator-free Otago Peninsula in Dunedin
- local government in Otago: ORC working on biodiversity; DCC Env. Plan, but we have a biodiversity crisis
- interesting presentations, complementary discussions; WR trying to get messages across with various relevant submissions
- ILM desirable requirement; WR will continue to promote this
- other countries have functional ILMs, e.g. Ecuador (work with farmers), Mexico, Colombia: Discussion paper by Robt. Hofstede of Quito tabled: ILM introduced, taken up at government level; compensation by beneficiaries
- we can do it too!
- WR will continue to promote.

Jocelyn Harris  
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Ref for Luci in NZ

<http://www.sciencedirect.com/science/article/pii/S2212041616304168?via%3Dihub>