The Pohutukawa Project — Citizen Scientists assessing management options for a monoculture forest on Tiritiri Matangi.

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Tiritiri Matangi

- 220 h island
- 3 km from Whangaparaoa
- Farmed until 1970
- 6% bush remained
- Hauraki Gulf Maritime Park
- Research begun 1970’s
- WWF funding
- 1984 – 1994 planting

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Pohutukawa on Tiritiri Matangi

- Planted as “nursery crop”
- Acts as nursery crop and canopy
- Advice strike rate of 30%
- Actual strike rate – high 90%, low 60-70%
- Large number planted ≈ 90,000
- Formed dense monoculture forest
- Pilot work by rangers to introduce light wells
- 7 sites chosen - proposal to expand pilot work

- “Green desert”

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Why Citizen Science?

- Volunteer opportunities decrease as restoration project matures
- Planting ended 1994 – took away opportunities 100's volunteers
- Guiding concession involves volunteers – not for everyone
- Citizen science – ranges from data gathering to planning/running
- Traditionally led by scientists/researchers
- Tiritiri Matangi – volunteers considered partners e.g.hihi translocation
- Review 2000's - translocation monitoring focused on short term, little long term
- Citizen Science allows restoration projects to plan long term projects important for management

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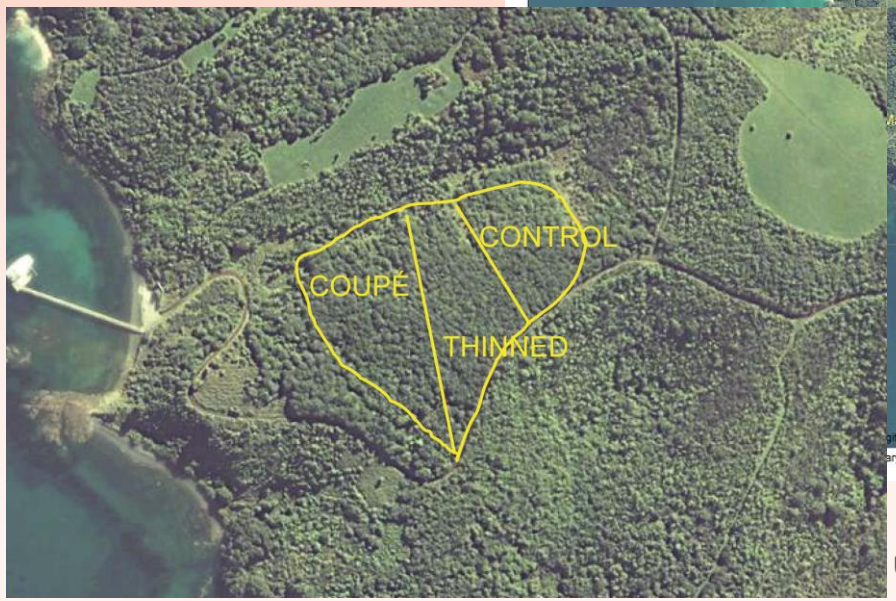
Design and Cutting

- **Simple design**
- **7 sites – 3 treatments**
  - Control (no cutting)
  - Thinning (every 2-3 trees)
  - Coupé (2-3 trees = 10 m light well)
- **Trees marked**
- **3 person team**
- **Monday – Friday only**



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Monitoring Vegetation

- Plots 2m x 1 m
- 6 plots per treatment
- Snow poles
- Core area not disturbed
- Seedlings
  - **<30 cm, 30 – 120 cm, >120 cm**
- 5 main species
- Monitored annually (excluding pandemic) until 2021
- Moved to 5 yearly cycle

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Monitoring Invertebrates

- 3 years only
- 6 sites only
- 5 pitfall traps per treatment
- 5 metres apart
- Propylene glycol
- Monthly samples for 6 months
- 540 samples per season
- Contracted identification

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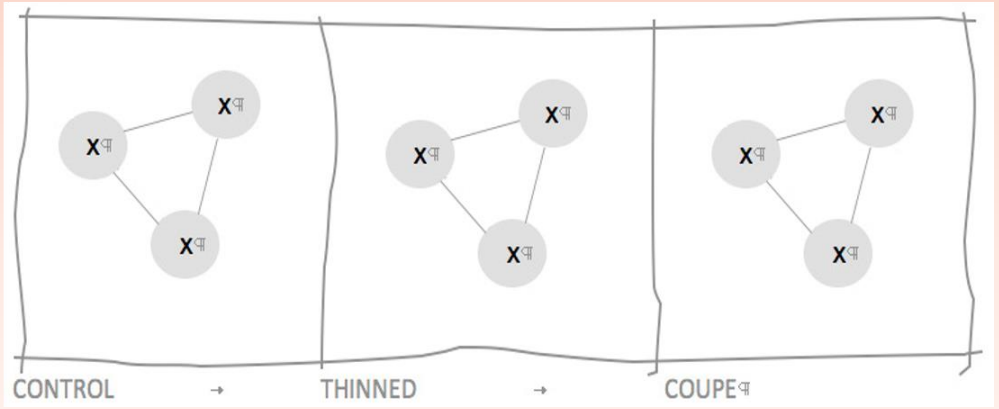
Monitoring Birds

- In all treatments…..
- 3 points equilateral triangle
- 15 metres per side
- 5-minute counts
- 10 metre radius
- Counts at points 1, 2, 3 and 1
- Counts annually since 2013
- June, July and August

- 3-4 volunteers per team
- More data
- Team approach supports training



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What did we Find?

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What Cutting Regime works Best?

- **What works? It depends!**
  - Sheltered + Moisture = Coupé
  - Drier areas = Thinning
  - Very exposed = Do Nothing!
    (Summer temperatures <38°C)

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What Came up?

- **NOT mānuka, kānuka**
- **Big 5**
  - Karamu (most)
  - Karo
  - Kohekohe
  - Māhoe
  - Mingimingi (*C.rhamnoides)*
- **Big 5 – 77% – 92% seedlings**
- **Karamu between 30% - 78%**
- **Rest from 22 plant/tree species surveyed**

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What Came up?

- **What was around!**
  - Wharangi if nearby
  - Māpou
  - Kowhai
  - Porokaiwhiri
- **Species brought in by birds came later**
  - Pūriri
  - Tawāpou

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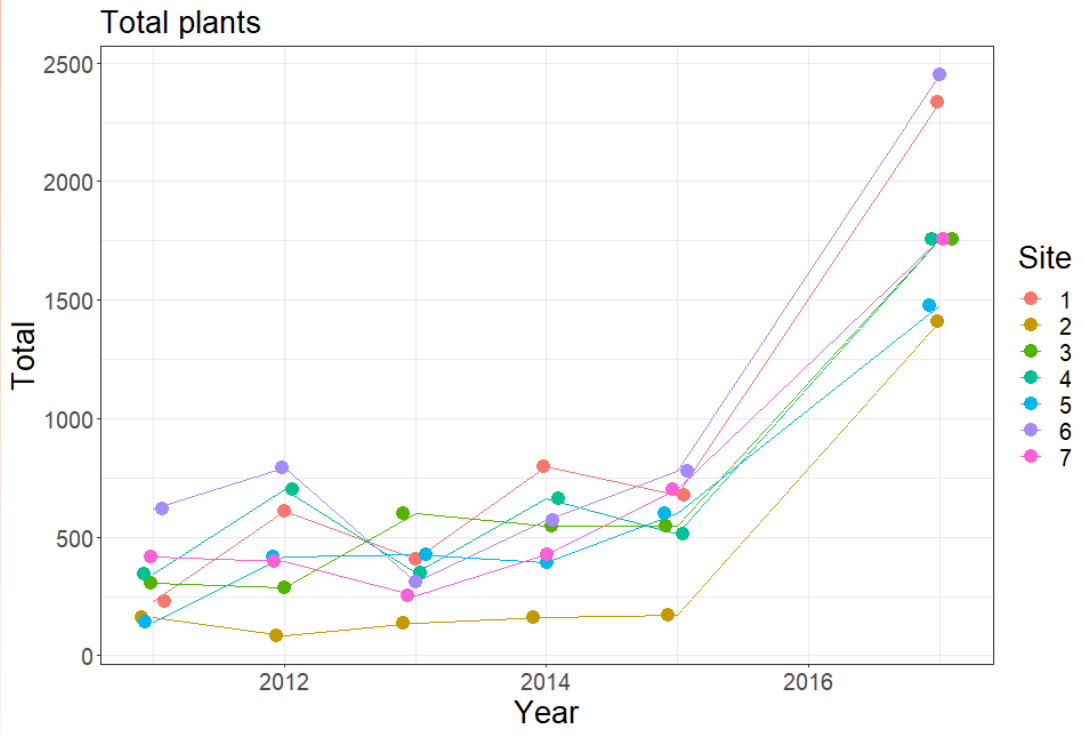
Total Plant Counts

- **Total plant counts**
  - Only small changes 5 years
  - Sharp rise in numbers
  - “Hockey stick” effect
- **No clear climate effect**
  - Rainfall up and down throughout
- **Plant counts likely to drop**
  - Larger saplings shading out plots



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Bird Counts

- **24 different species recorded once**
  - Pōpokotea most frequently sighted
- **Grouped**
  - Frugivores – 40-45% counts
  - Insectivores
  - Variation mainly due to number of counting occasions and number of observers

- **By 2017…**
  - 10% more birds on thinned, coupé sites
- **Huge differences between sites**
  - Everything statistically significant
  - Patterns not consistent across sites

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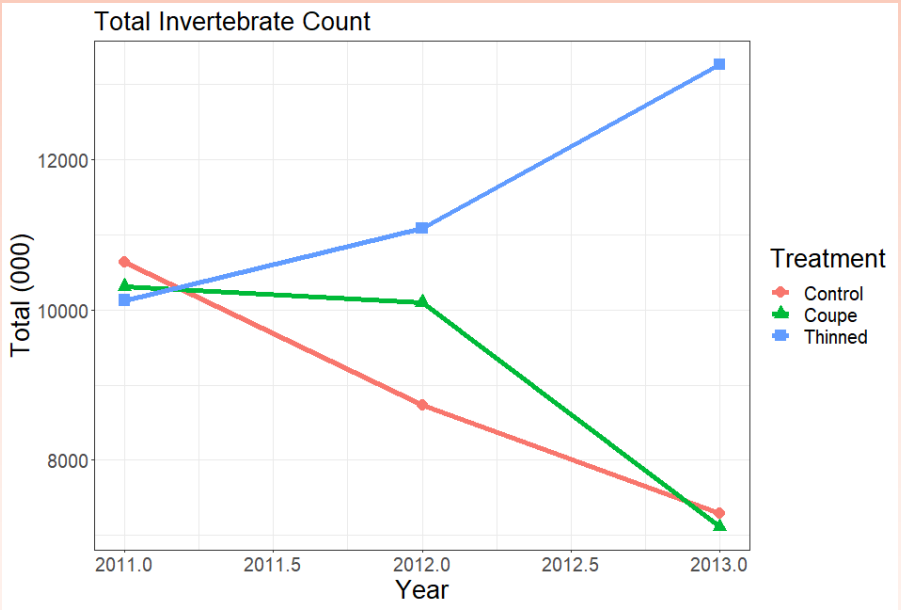
Invertebrates

- **Results consistent between sites and across time**
  - Site 5 counts highest
  - Site 4 counts lowest

Invertebrate Counts: All years				
Site	**Control**	**Thinned**	**Coupe**	**Total**
5	5897	15028	7747	28672
1	5864	4705	4898	15467
7	4939	4103	4742	13784
3	3992	4026	5263	13281
6	4087	2819	2681	9587
4	1882	3798	2192	7872
Total	**26661**	**34479**	**27523**	**88664**

- **Across first 3 years of project – appears thinning best**
- **Is this a trend or will it change?**



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What do we Recommend?

- Happy for slow change – do nothing!
- Choose sites for cutting with care
- Consider summer ground temperatures
- Extra mixed planting beneficial
- “Bird larder” trees
- Strategy for cut trees – larger branches may not break down

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Final Thoughts

- **Invertebrates our greatest challenge**
- **Need to do another 3 season "pulse" to understand effect of cutting**
  - Requires new permit
  - Dedicated volunteer team (on and off island)
  - Facilities and personnel to clean
  - Contractor to identify = funding!
- **Bird counts to continue annually, vegetation plots 5 yearly**
- **Will we cut again? What to do with logs?**
- **Project showed us how to increase diversity in monoculture forest**
- **Offered volunteers opportunities to engage in citizen science**

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Citizen Science Projects on Tiritiri Matangi

- **Current Projects**
  - Kōkako monitoring and banding
  - Ruru nest survey
  - Ruru call survey
  - Kiwi call survey
  - Titipounamu monitoring and banding
  - Tieke monitoring and banding
  - Kākāriki nesting study
  - Transect bird survey (all species)
  - Seabird survey
  - Kororā nest monitoring
  - Kuaka (diving petrel) study.
  - Ōi (grey-faced petrel) monitoring
  - Pohutukawa Project bird counts
  - Bird diet study (app-based)
  - Moko kākāriki (elegant gecko) monitoring
  - Reptile tracking
  - Tuatara survey
  - Myrtle rust monitoring
  - Plant Phenology (in planning)

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