SoE Wetland Monitoring. Experiences, and Ecological Outcomes

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

GWRC Regional Wetland programme

- 3% of wetlands in the region remain = all wetlands are significant. About 300 wetlands identified in the Natural Resources Plan (NRP).
- Report on the effectiveness of new NRP Stock exclusion rules, restrictions on activities.

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

- Feedback on KNE (Key Native Ecosystem) management outcomes at all managed wetland sites
- Pest control – Weeds and animals
- Restoration – Plantings and reintroductions
- Trends on wetland condition over time

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Wetland Survey Design

- 5 year return period
- 3 of 30 wetlands surveyed for wetland birds and fish per year
- 30 wetlands surveyed per year for condition, a total of 150 regionally

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

- SoE Wetland survey will assess the condition of all 30 KNE managed wetlands
- A random selection of non managed wetlands
- Survey rotation is based on the 5 regional catchment areas

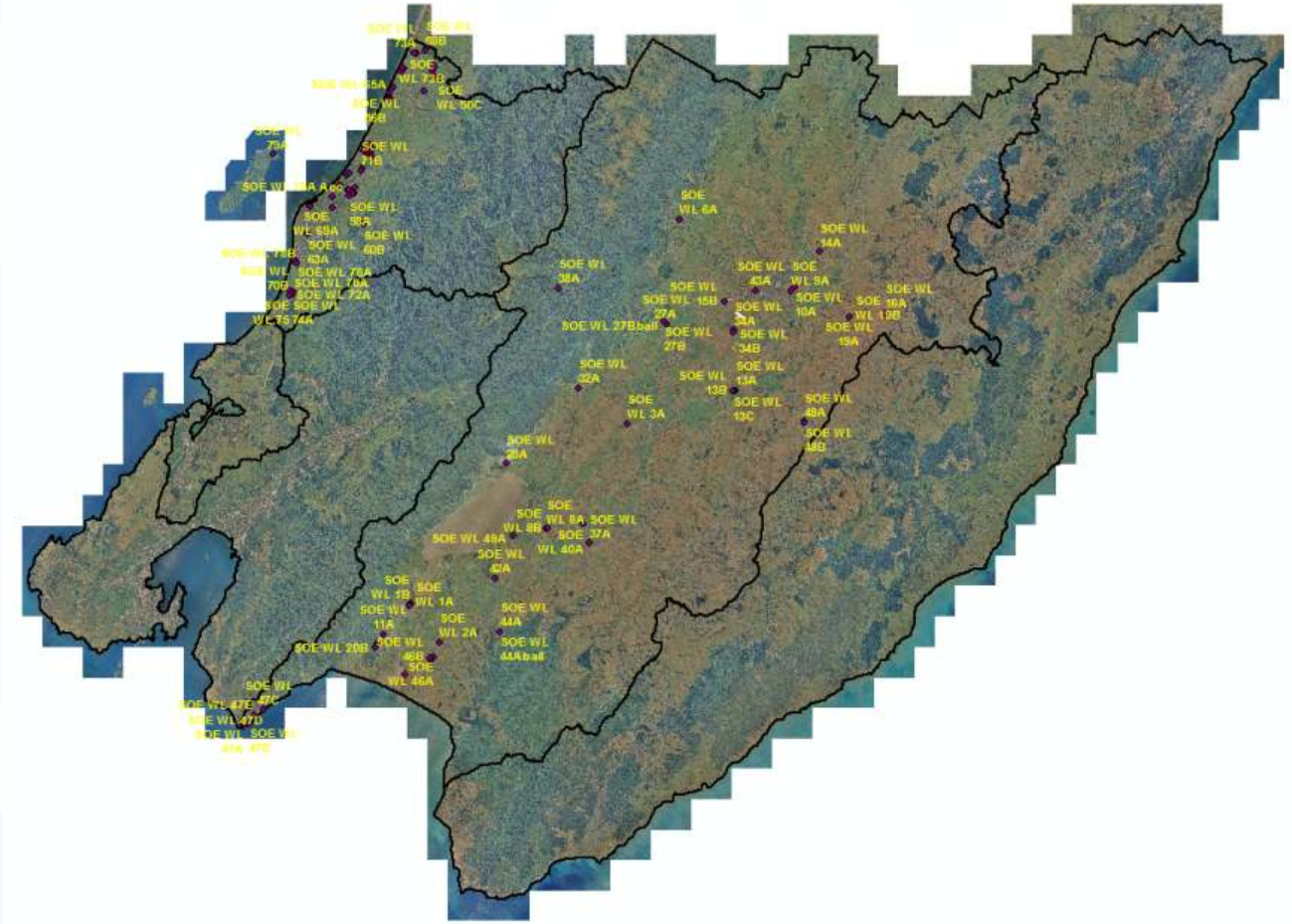
greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Programme to date:

- Year 1 – Ruamahanga catchment
- Year 2 – Kapiti coast
- Year 3 – Hutt and Porirua catchments (2019)

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

SoE plots 2017 - 18



greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Methodology

- Assessments of the Wetland Condition Index (WCI)
- Based on“Handbook for monitoring wetland condition” Clarkson *et al.* 2004 - in conjunction with more recent recommendations
- Refinements of the method continue

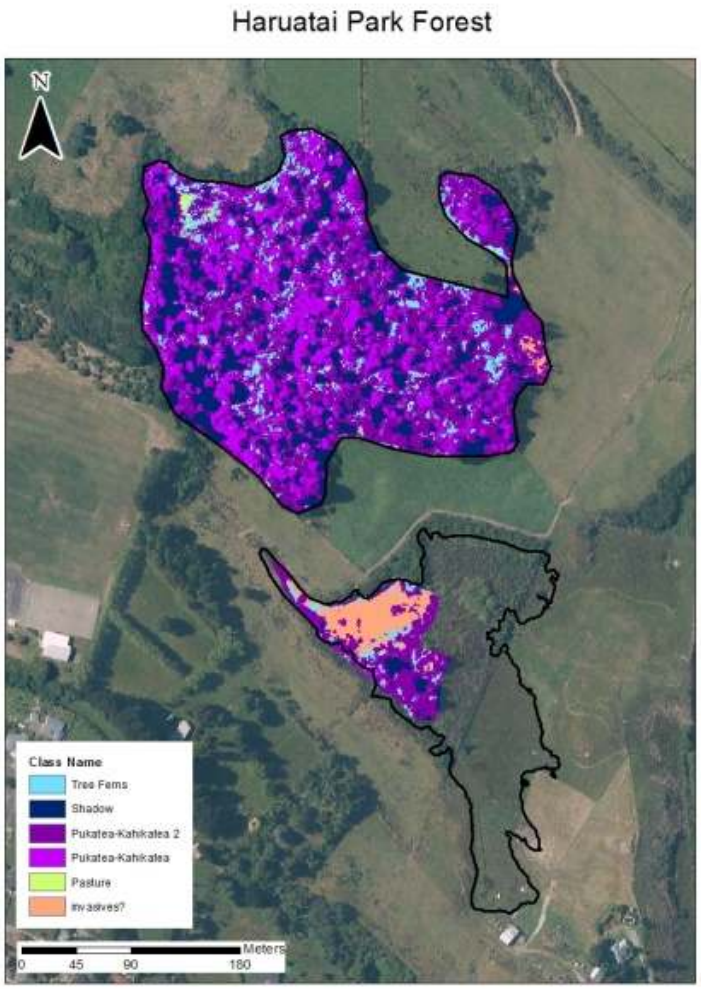
greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Wetland Survey Components

- Condition index (0-25)
- Pressure index (0-25)
- 1-5 plots - 5 x 5 meters in dominant vegetation types
  - Vegetation survey
  - Soil assessment
  - Nutrient levels – soils and plants

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Vegetation types



greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Plot Location

Haruatai Park Forest (#1)

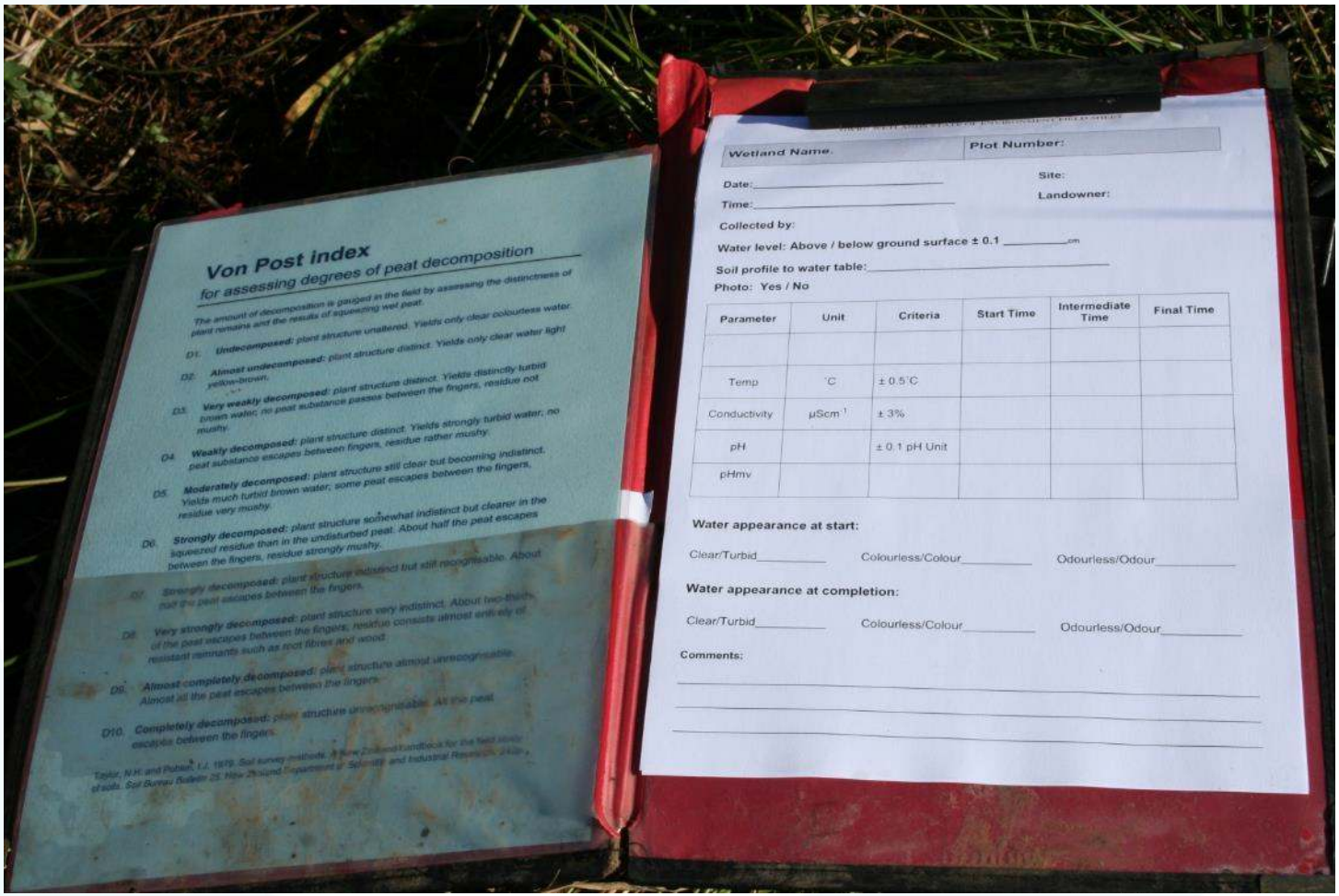
greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Plot setup

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao



Von Post index

for assessing degrees of peat decomposition

The amount of decomposition is gauged in the field by assessing the distinctness of plant remains and the results of squeezing wet peat.

D1. **Undecomposed:** plant structure unaltered. Yields only clear colourless water.

D2. **Almost undecomposed:** plant structure distinct. Yields only clear water light yellow-brown.

D3. **Very weakly decomposed:** plant structure distinct. Yields distinctly turbid brown water; no peat substance passes between the fingers, residue not mushy.

D4. **Weakly decomposed:** plant structure distinct. Yields strongly turbid water; no peat substance escapes between fingers, residue rather mushy.

D5. **Moderately decomposed:** plant structure still clear but becoming indistinct. Yields much turbid brown water; some peat escapes between the fingers, residue very mushy.

D6. **Strongly decomposed:** plant structure somewhat indistinct but clearer in the squeezed residue than in the undisturbed peat. About half the peat escapes between the fingers, residue strongly mushy.

D7. **Strongly decomposed:** plant structure indistinct but still recognisable. About half the peat escapes between the fingers.

D8. **Very strongly decomposed:** plant structure very indistinct. About two-thirds of the peat escapes between the fingers; residue consists almost entirely of resistant remnants such as root fibres and wood.

D9. **Almost completely decomposed:** plant structure almost unrecognisable. Almost all the peat escapes between the fingers.

D10. **Completely decomposed:** plant structure unrecognisable. All the peat escapes between the fingers.

Taylor, N.H. and Pohlen, I.J. 1979. Soil survey methods. A New Zealand handbook for the field study of soils. Soil Bureau Bulletin 25. New Zealand Department of Scientific and Industrial Research, 214p.

Wetland Name:	Plot Number:

Date:_____ Site:

Time:_____ Landowner:

Collected by:

Water level: Above / below ground surface ± 0.1 _____ cm

Soil profile to water table:_____

Photo: Yes / No

Parameter	Unit	Criteria	Start Time	Intermediate Time	Final Time
Temp	°C	± 0.5°C			
Conductivity	µScm $^{-1}$	± 3%			
pH		± 0.1 pH Unit			
pHmv					

Water appearance at start:

Clear/Turbid_____ Colourless/Colour_____ Odourless/Odour_____

Water appearance at completion:

Clear/Turbid_____ Colourless/Colour_____ Odourless/Odour_____

Comments:

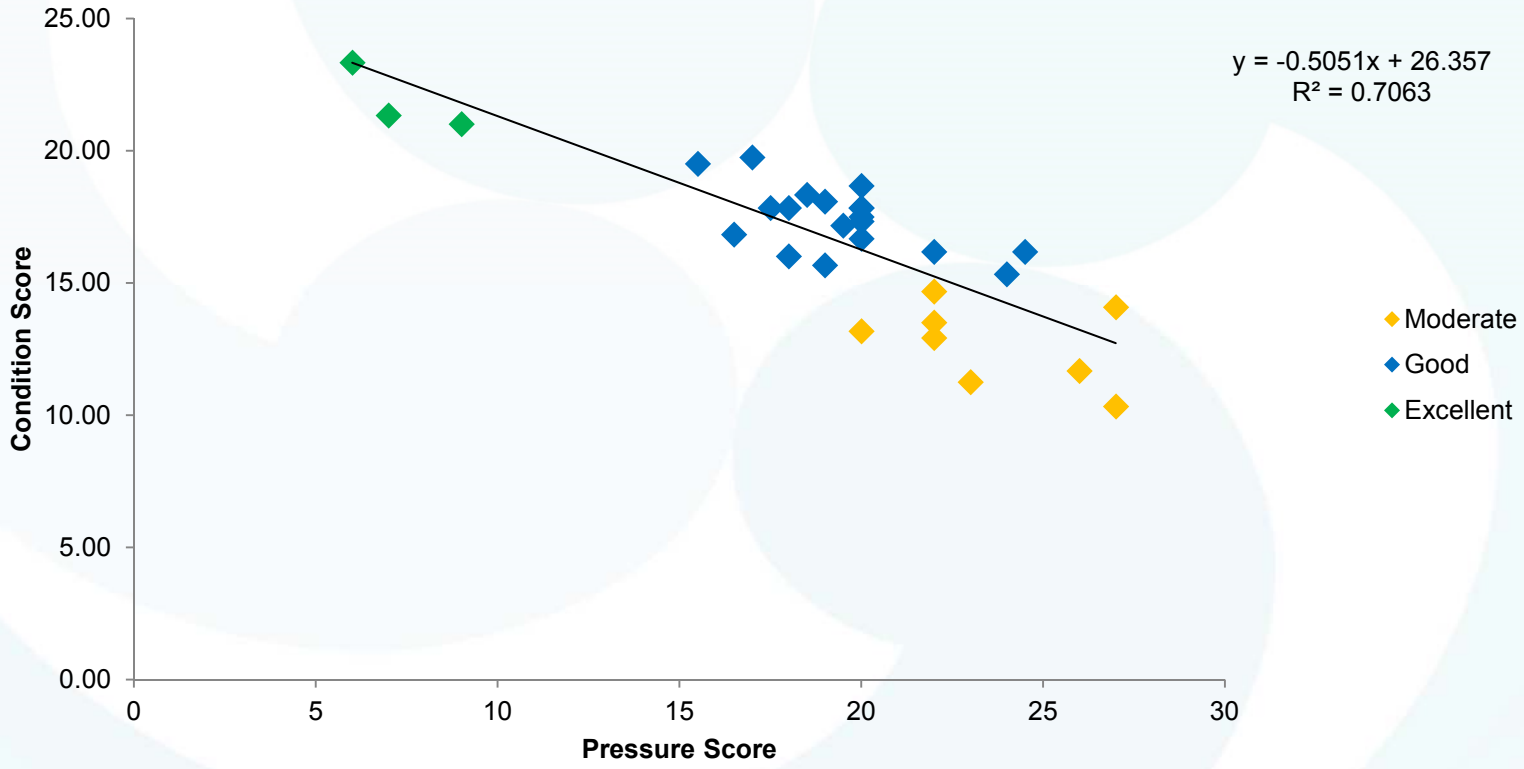
greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Results

- Ruamahanga (WCI) scores
  - 10% excellent
  - 60% good
  - 30% Fair to moderate
- Highest score - 23.33
- Lowest score – 10.33

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Relationship between the Wetland Condition Score and the Wetland Pressure Scores for the surveyed wetlands



greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Dry bulk density (a measure of soil compaction) was also highest in plots where livestock were not excluded or where earthmoving machinery had been used to re-construct wetlands (see Figure 3.5).

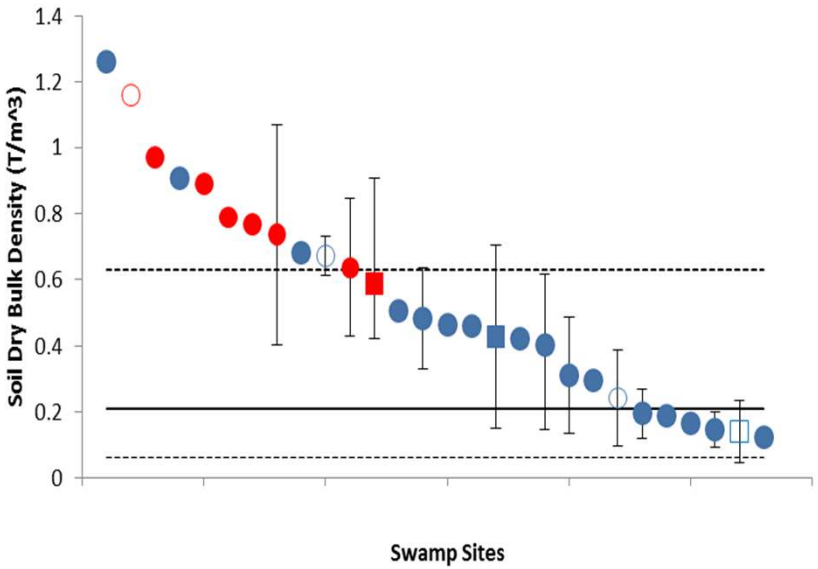


Figure 3.5: Ranked dry bulk density levels in swamp sites with national mean (black line) and upper and lower limits (dashed lines) (Clarkson et al 2015). Red indicates no livestock exclusion, open symbols are KNEs, circles are significant wetlands and squares are outstanding wetlands

Birds and Fish surveys

- Brown mudfish, bullies, koura and eels
- Spotless crake found at 2 sites

Site	Wetland birds	Fish
Wetland 1	1 pair and 2 individual spotless crake	Short-finned eel and koura
Wetland 2	4 pairs spotless crake	Brown mudfish, bullies, shortfinned eel, longfin eel
Wetland 3	No target species detected	Brown mudfish, upland bully, longfin eel

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao