greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

# Wetland Health State of the Environment monitoring programme

## Annual data report, 2017/18

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# Contents

# 1. Introduction

This report summarises the results of the Wetland Health State of the Environment (SoE) monitoring programme for the period 1 July 2017 to 30 June 2018 inclusive. The Wetland Health monitoring programme has been designed to survey 150 wetlands across the Wellington Region over a 5 year timeframe. The region has been divided into five whaitua (super-catchment areas) by Greater Wellington Regional Council (GWRC) for the purposes of freshwater planning. Thirty wetlands are surveyed annually, with a whaitua-based approach being taken in the sampling programme. The order in which wetlands are being sampled in each whaitua is as follows:

- Year 1 - Ruamahanga,
- Year 2 – Kapiti Coast,
- Year 3 - Porirua and Hutt/Wellington,
- Year 4 - Eastern Wairarapa
- Year 5 - Ruamahanga and Kapiti remaining wetlands.

In addition to this sampling, three wetlands a year are surveyed in the relevant whaitua for the presence and abundance of fish and indicator wetland bird species. This report details the results of wetland health monitoring undertaken at 30 sites in Year 2 of the programme in 2017/2018.

# 2. Overview of the Wetland Health SoE monitoring programme

Wetlands are recognised by GWRC as a key ecosystem type that has undergone major decline. Only 2.3% of the original wetland extent is estimated to remain in the Wellington region (Ausseil et al 2003). The National Policy Statement on freshwater management details that 'The overall quality of fresh water within a region is maintained or improved while … protecting the significant values of wetlands." GWRC's proposed Natural Resources Plan (pNRP) contains policies, rules and methods related to the protection and improvement of wetland health.

GWRC also has a Key Native Ecosystem (KNE) programme which aims to improve ecological outcomes at selected high value ecological sites in the region. The KNE programme includes 30 wetlands. The aim of the Wetland Health SoE monitoring programme is to monitor the state of wetlands in the region to determine the effectiveness of GWRC policies and interventions through the KNE programme. We do this by surveying 30 wetlands per year, with a return time of five years, so that 150 wetlands in total will be assessed.

## 2.1 Monitoring objectives

The aim of the Wetland health SoE monitoring programme is to measure the state and trend of wetland health across the Wellington region. The work described here aims to monitor:

1. the state and trend of wetland health in the Wellington region,
2. the effectiveness of the proposed Natural Resources Plan (pNRP) policies, rules and methods, and
3. the outcomes of management at selected wetland sites.

## 2.2 Monitoring network

### 2.2.1 Wetland health programme

The monitoring network is based on sampling the 211 wetlands that have been scheduled in the proposed Natural Resources Plan (14 of which have been designated 'Outstanding" and 197 as "Significant). All 14 "Outstanding" wetlands and the 74 wetlands managed under GWRC's KNE programme were included in the sample, along with a randomised selection of the remaining wetlands. Proportional representation of wetlands between whaitua was maintained during the randomisation process. The distribution of the 30 selected wetlands surveyed in 2017/2018 in the Kapiti Coast whaitua are shown in Figure 2.1.

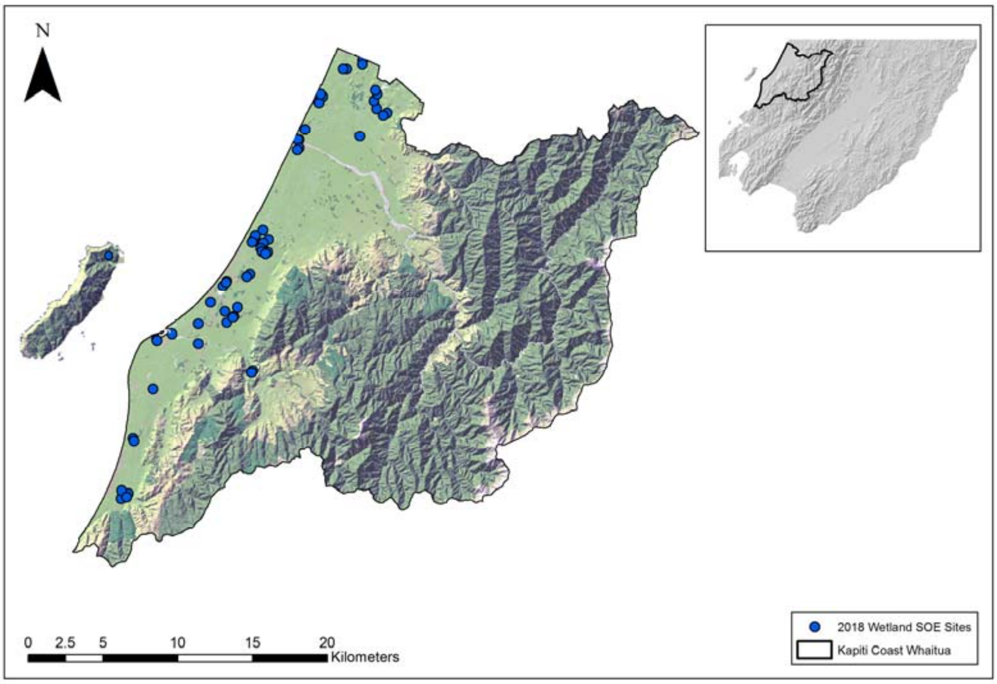


**Figure 2.1: Wetlands surveyed in the Kapiti Coast whaitua in 2017/2018**

### 2.2.2 Fish and wetland bird sampling

Three of the 30 wetlands were selected for bird and fish surveys in the Kapiti Coast whaitua based on their significance and vulnerability to change. Fish and bird survey sites were selected within the wetlands based on habitat and accessibility. The number of sites fished varied between one and four sites per wetland.

## 2.3 Monitoring variables

### 2.3.1 Wetland Health programme

Wetland monitoring followed Clarkson et al 2003, with adaptations from Clarkson et al 2013. The following indices/attributes were surveyed:

- Wetland Condition Index
- Wetland Pressure Index
- Vegetation composition
- Soil condition
- Plant nutrient status

The Wetland Condition Index is a compositie index that uses indicators of the following components of wetland health:

- Hydrologic integrity
- Physiochemical parameters
- Ecosystem intactness
- Browsing/predation/harvesting
- Dominance of native plants

Assessments were made at both the wetland scale and at a more detailed plot level. A Wetland Pressure Index was also scored at the landscape scale for each wetland.

The vegetation composition was sampled in 5m x 5m plots randomly located in all plant communities covering > 20% of the terrestrial area of the wetland. Field measurements of water table depth, water conductivity and pH (if water is present) and von Post (if peat is present) were recorded at each plot. Two soil core samples (100mm diameter x 70mm depth) were collected from the plot boundary and analysed in the laboratory for water content, bulk density, pH, conductivity, total C%, total N% and total P. Note that soil samples were not collected from all plots as in some instances the water table depth was too high at the time of sampling. Leaf samples of the two dominant canopy species present were also collected and analysed for %N and %P.

### 2.3.2 Fish and wetland bird surveys

Sampling of birds and fish was conducted in spring. Gee-minnow traps (3mm mesh) and finemesh fyke nets with exclusion chambers were set overnight and retrieved at first light to minimise hypoxia risk. Up to five fyke nets and 10 Gee-minnow traps were deployed at each site where accessibility allowed. Species, numbers and size classes were recorded for fish. All fish were released alive at their capture location.

Wetland birds were surveyed from the margins of each wetland using play-back calls for spotless and marsh crake. Surveys were conducted between 3pm and midnight, and in the morning starting 1 hour after midnight. Listening for bittern calls took place between 3am and 1 hour after sunrise. Recording devices were also left at each wetland for 4-6 weeks and were pre-set to record bird call for 4 hours at dusk and 2 hours before dawn. Species, number and location were recorded for wetland birds.

# 3. Results

## 3.1 Wetland types

Wetlands are classified by the overall wetland class, but different wetland classes can occur within a wetland, (e.g. an ephemeral wetland on the side of a swamp). Twenty-two wetlands were classified overall as swamps, with six fens and two saltmarsh wetlands also being surveyed. Three of the swamp wetlands also contained areas of marsh. Each wetland had between one and five plots established depending on the number of vegetative communities present. A total of 58 plots were established across the 30 wetlands surveyed. Eight vegetation community types were identified as present: forest, shrubland, flaxland, reedland, rushland, sedgeland, grassland and herbfield. Some wetlands are dominated by one vegetation type, while others contain more than one or multiple types.

## 3.2 Wetland Condition Index (WCI)

A range of condition scores were recorded for the 30 wetlands surveyed in the Kapiti Coast whaitua in 2017/2018, with the highest WCI score being 20.75 and the lowest 13.5 (see Figure 3.1).


**Figure 3.1: Ranked Wetland Condition Scores for wetlands surveyed in the Kapiti Coast whaitua**

Using the scoring system of Clarkson et al 2015:

- 1 site was classified as being in excellent condition,
- 24 sites were in good condition, and
- 5 sites were in moderate condition.

## 3.3 Wetland Condition Index components

The scoring for wetland condition is comprised of the following components: hydrological integrity, physiochemical, ecosystem intactness, browsing/predation and dominance of native plants. None of the surveyed wetlands had excellent scores for hydrological or physiochemical parameters on the Kapiti Coast (see Figure 3.2). This is in contrast to the results gathered last year from wetlands in the Ruamahanga whaitua (Crisp et al 2018) where there were some wetlands that had high scores for those parameters. Hydrological integrity and physiochemical factors on the Kapiti Coast have been affected by catchment-level issues, such as urbanisation, water take and land use practices. In the Ruamahanga whaitua, the surveyed wetlands were located in different catchment areas with vaying topography, while the wetlands on the Kapiti Coast were largely located on the lowlands which have undergone major transformation over time. Ecosystem intactness, browsing/predation and dominance of native plants are influenced by site-based management. As for the Ruamahanga whaitua, there were a few wetlands that had poor scores for native plant dominance. This is a reflection of pest plant invasion into the wetlands in the region.

## 3.4 Wetland Pressure Scores

The Wetland Pressure scores ranged between 5 and 25 (out of 35). In general, the Wetland Condition Index scores were a reflection of the Wetland Pressure Scores with wetland condition being inversely related to pressure scores (see Figure 3.3). When compared to the spread of Wetland Pressure Scores in the Ruamahanga whaitua however, there is a much greater clumping of scores at the higher end of the pressures scale. This is considered to be a result of the higher level of human impact on the Kapiti Coast landscape.

## 3.5 Soil analyses

The aim of soil analysis was to detect human-derived inputs and impacts of nutrients. Total carbon, total nitrogen, total phosphorus were all measured in soil cores at each plot, but understanding how this data will be used to assess wetland health is still in development. This is challenging as nitrogen levels are influenced by natural inputs from plants and the reduction of nitrogen in the wetland environment. Nitrogen levels do not necessarily reflect the nutrient inputs to a wetland as previously mentioned because denitrification is a feature of wetlands and nitrogen is bound to carbon in the wetland organic material. Similarly, total phosphorus can reflect the composition of the wetland itself, rather than nutrient inputs. Some analyses of total carbon and bulk density levels are of interest however.

Interim national limits for some soil variables have been developed for swamps, bogs and fens, but not for marsh, saltmarsh, ephemeral or shallow water wetland types at this stage (Clarkson et al 2015). It should be noted that interim national limits have been set for wetlands that have a WCI score of >15 and five of the sites reported here fell below that score. Nevertheless, all plots are included in the comparison with the national limits (even for wetlands with a WCI below 15).

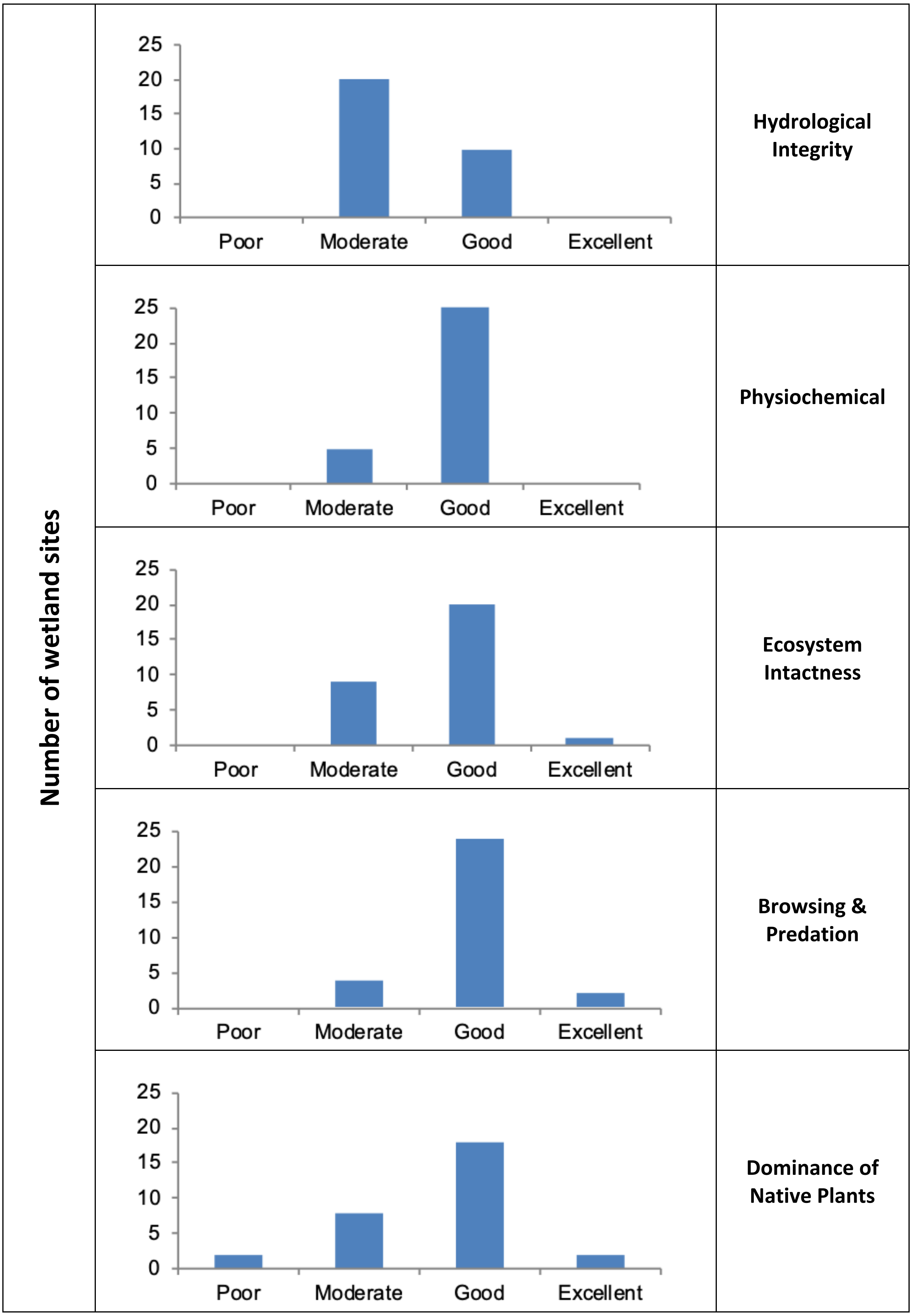


**Figure 3.2: Wetland condition component scores**

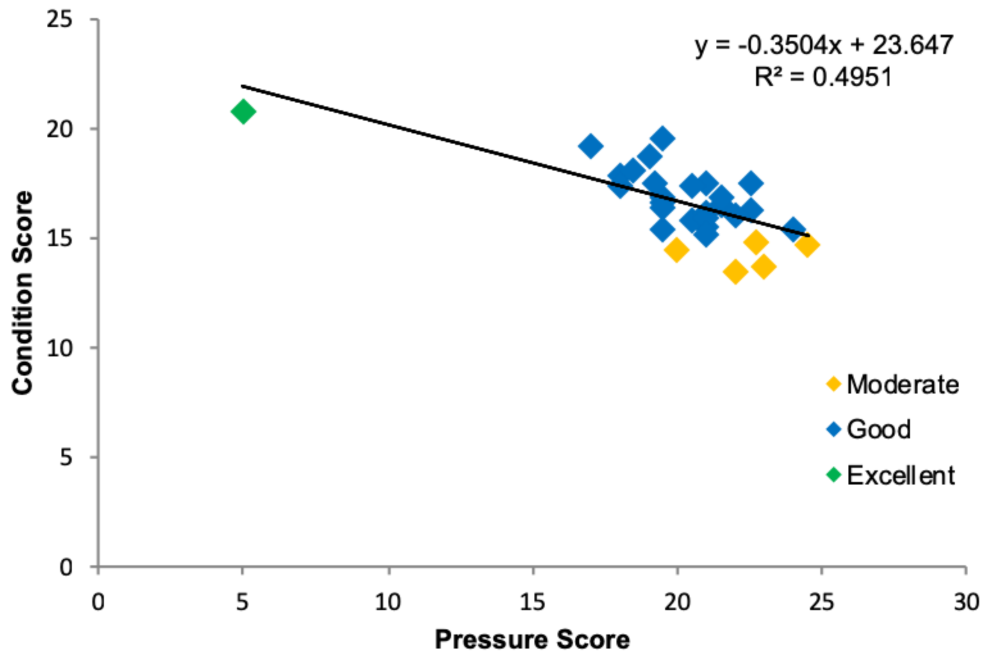


**Figure 3.3: Relationship between the Wetland Condition Score and the Wetland Pressure Scores for the surveyed wetlands**

Organic carbon and total nitrogen are indicators of the organic reserves in the soil derived from healthy plant communities. Livestock remove plant material that contributes to the organic carbon and total nitrogen stores in the soil. So where livestock have access to graze in a wetland we might expect to find lower soil organic carbon reserves. In the Kapiti Coast wetlands, ten of the swamps had organic carbon levels below the national critical limit (Figure 3.4), which we expect to have been a result of livestock grazing. Only one of these ten wetlands however had livestock accessing the wetland. This was in contrast to the results recorded for the Ruamahanga whaitua wetlands (where stock had access to six out of seven wetlands where organic C levels were found to be below the lower national critical limit). It is possible that the effects of soil compaction from past stock grazing (prior to land use change to lifestyle blocks) is still impacting the wetlands. The Kapiti Coast wetlands have largely formed as dune slack wetlands and the soil is comprised of peat on top of sand. Peat is mostly composed of organic material and so should have high organic carbon levels, but the sites that scored below the national critical limit had soils with thin peat layers overlying sands. These wetlands with low organic carbon were nearer the coast and have younger soils with less well developed peat layers that have formed in more recent times than those wetlands located further inland.

No fen wetlands had organic carbon levels below the national lower critical limit (Figure 3.5). The same wetlands that had low organic matter also had dry bulk density levels above the national upper limit (Figure 3.6).There was one fen site that had a bulk density level above the national critical limit – this site was forested (Figure 3.7).

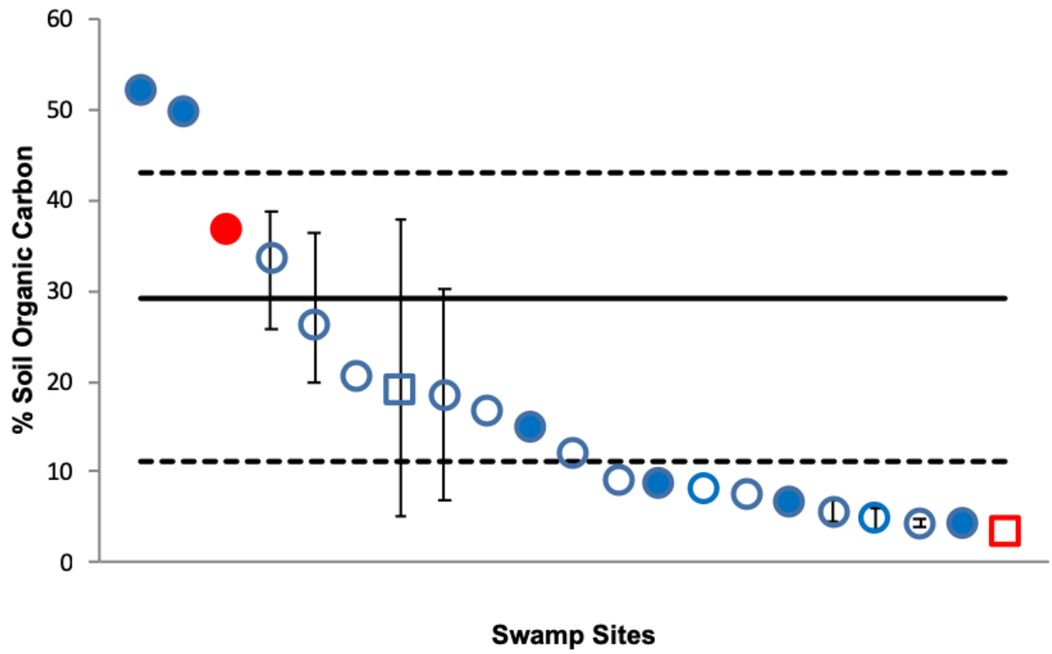


**Figure 3.4: Ranked organic carbon levels within swamp sites with national mean (black line) and upper and lower critical limits (dashed lines) (Clarkson et al 2015). Red indicates livestock have access to the wetland, open symbols are KNEs, circles are significant wetlands and squares are outstanding wetlands**

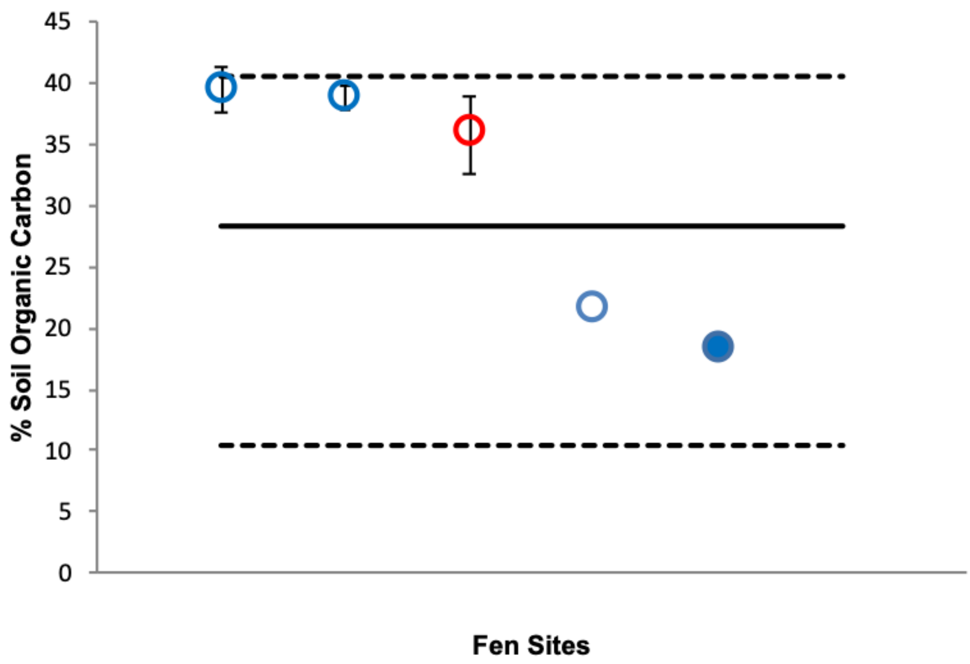


**Figure 3.5: Ranked organic carbon levels within fen sites with national mean (black line) and upper and lower critical limits (dashed lines) (Clarkson et al 2015). Red indicates livestock have access to the wetland, open symbols are KNEs, circles are significant wetlands and squares are outstanding wetlands**

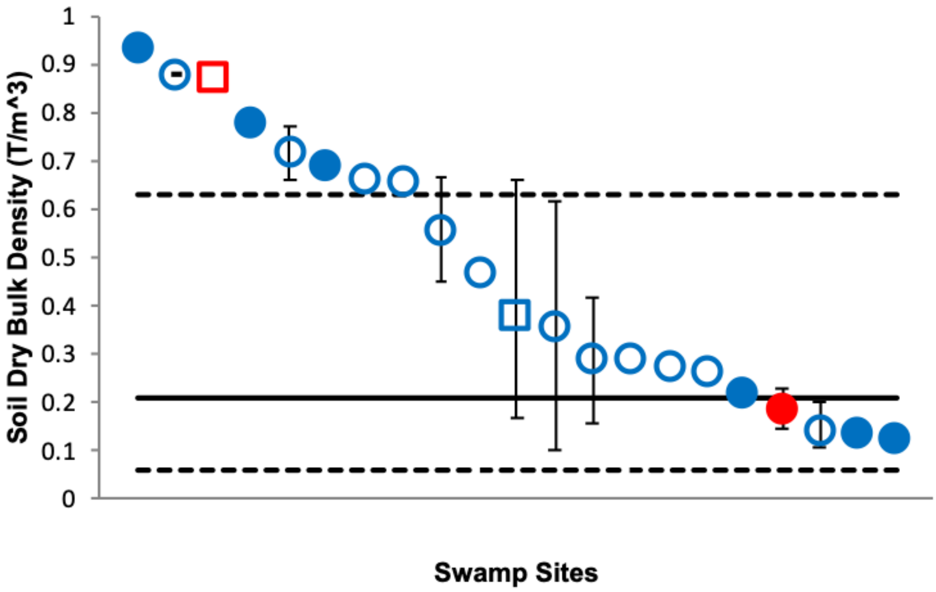


**Figure 3.6: Ranked dry bulk density levels in swamp sites with national mean (black line) and upper and lower limits (dashed lines) (Clarkson et al 2015). Red indicates livestock have access to the wetland, open symbols are KNEs, circles are significant wetlands and squares are outstanding wetlands**

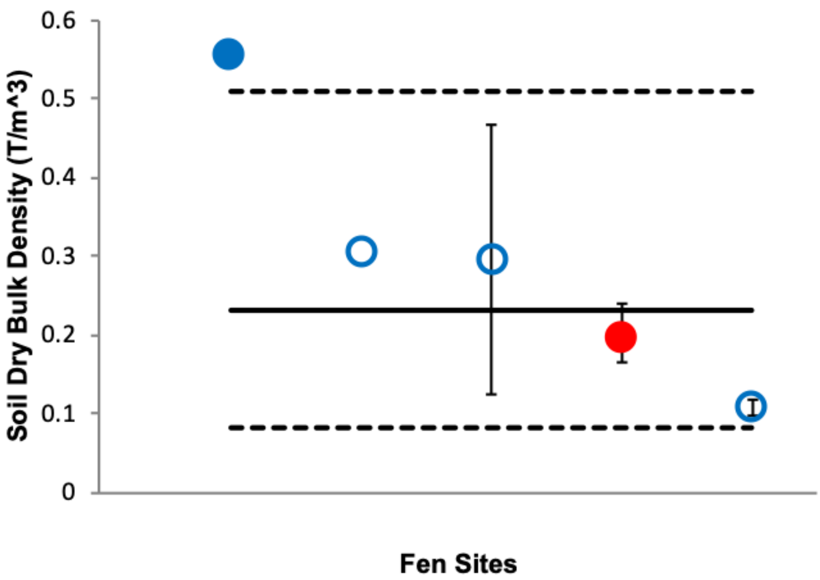


**Figure 3.7: Ranked dry bulk density levels in fen sites with national mean (black line) and upper and lower limits (dashed lines) (Clarkson et al 2015). Red indicates livestock have access to the wetland, open symbols are KNEs, circles are significant wetlands and squares are outstanding wetlands**

## 3.6 Native species dominance

Native species dominance within the different vegetation community types is shown in Figure 3.8. Wetlands with herbfield communities present had the lowest percentage of native species and cover, while forested wetlands had high native species dominance. Wetlands with herbfield, grassland and rushland communities scored the lowest native species dominance, and in lowland areas commonly contained a mix of exotic and native species. Wetland communities with low native species dominance have been impacted by external effects which allow for exotic species to invade and outcompete native wetland species, such as lowering of the water table, altered hydrology, high nutrient levels, or grazing by stock or rabbits.

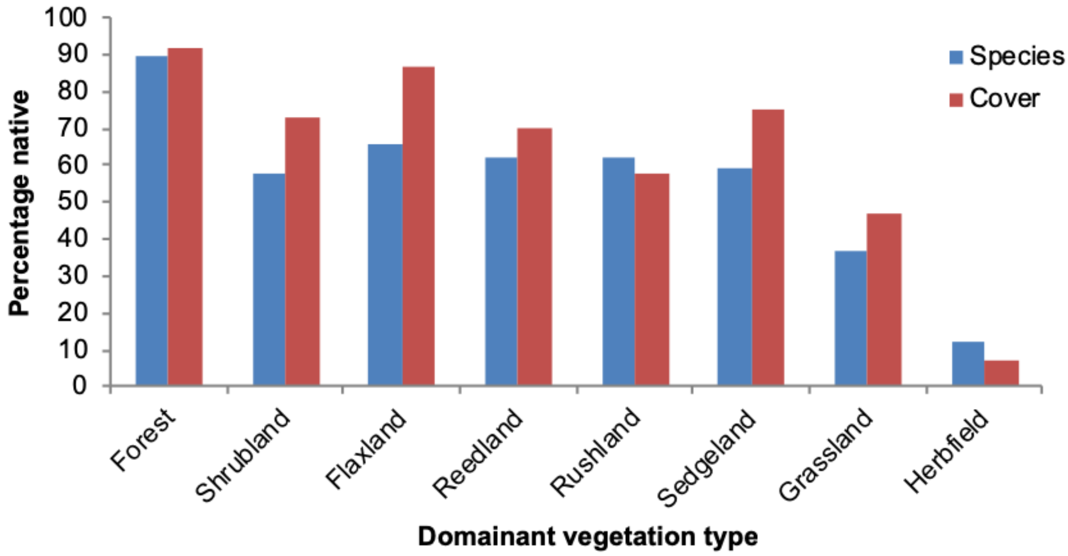


**Figure 3.8: Percentage of species and cover composed of native species in each vegetation type**

## 3.7 Spring faunal surveys

The findings from the three selected wetland sites surveyed durng the spring are shown in Table 3.1.

**Table 3.1: Wetland bird and fish species identified during spring surveys**

| Site | Wetland birds | Fish |
|---|---|---|
| Wetland 1 | 25 spotless crake | Short-finned eel, common bullies, inanga |
| Wetland 2 | 27 spotless crake, 1 marsh crake | Brown mudfish, common bullies, shortfinned eel, inanga |
| Wetland 3 | 14 spotless crake | Longfin eel, shortfin eel, common bullies |

# 4. Discussion

A high number of the wetlands surveyed in the Kapiti Coast whaitua (over 80%) were categorised as being in excellent or good condition by national standards. The national categories however have been set based on a small sample of wetlands from across New Zealand and may be refined as more data, particularly from wetlands in developed catchments, becomes available. This may, for example, mean that the national bottom line is ultimately set at a higher WCI. Wetlands in developed agricultural landscapes have significantly lower WCI scores than wetlands in indigenous dominated catchments (Clarkson et al 2013).

The Wetland Pressure scores recorded for the Kapiti Coast whaitua were higher than those of the Ruamahanga whaitua. This is thought to be due to the high degree of modification that has occurred on the Kapiti lowlands through urban and rural development.

Livestock grazing in wetlands is expected to result in low levels of organic matter and high levels of bulk density in the soil. This is because livestock feeding on plants, reduces their contribution of vegetative material to the soil organic fraction and heavy (~400kg cattle beasts) animals compact the soil through their trampling action. The organic fraction of the soil provides nutrients and creates soil structure that retains moisture for plant growth. While compaction reduces pore spaces for gaseous exchange and water infiltration in the soil (Sorenson, 2012). A pattern of low organic matter and high bulk density was seen in grazed wetlands sampled in the Ruamahanga (Crisp et al 2018). Fewer wetlands had stock access on the Kapiti Coast however, one quarter of the wetlands sampled had low organic matter. This may have been a result of the wetlands on the Kapiti Coast being located on a geologically recently formed sand plain. Soils with a high sand fraction are naturally dense and the relatively recent age of these wetlands may explain their soil low organic fraction. The soil structure of the wetlands may also be impacted by previous agricultural grazing, prior to changes in land use (e.g. urbanisation).

Twenty wetlands within Key Native Ecosystem (KNE) sites were assessed during this sampling. These surveys have been able to point to areas that need attention to improve the WCI in these KNEs and thereby can inform management actions. Changes in the WCI over time will provide data on the outcomes of management. In terms of plan effectiveness, the need for more landscape management to improve the WCI scores has been highlighted through the results detailed in Section 3.3. Changes in wetland health do not occur rapidly, but this monitoring programme has established the baseline condition of wetlands in the Kapiti Coast whaitua and will be able to provide an assessment of changes in condition that occur over time. The spring bird and fish surveys have provided good information about the species present in the wetlands sampled and the health of those sites. The high numbers of spotless crake in the Kapiti Coast wetlands highlight the importance of this habitat to those species. Shortfin eels and common bullies were the most abundant and widespread fish species found. While migratory access for aquatic fauna was present in the wetlands closer to the sea, barriers further inland have resulted in reduced wetland fish numbers.

# 5. Acknowledgements

The field team who collected the data for the summer wetland surveys included Shona Myers, Owen Spearpoint and Faline Drummond. Shona also produced a background report on the survey data, while Faline Drummond completed the analysis of the soils data and provided the figures for this report. Soil analysis was completed by Landcare Research Ltd. The spring bird monitoring was conducted by Shane Cotter and Owen Spearpoint and the fish monitoring by Amber McEwan of Riverscapes Freshwater Ecology Ltd.

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# Appendix A: Data tables

## Appendix 1: Wetland protection status in the GWRC Proposed Natural Resources Plan, current state of stock exclusion, and soil mean dry bulk density and percentage organic carbon at each fen and swamp site monitored in the Kapiti Coast whaitua over summer 2017/2018. Data are not shown for two sites where no soil cores were collected as the plots were inundated with water or for the two salt marsh sites

| Site | No. plots sampled | GWRC protection | Stock excluded | Dry bulk density (t/m²) | | | % Organic Carbon | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Mean | Min | Max | Mean | Min | Max |
| SOE WL50 | 3 | Significant, KNE | Y | 0.30 | 0.16 | 0.42 | 26.10 | 20.00 | 36.40 |
| SOE WL51 | 1 | Significant, KNE | Y | 0.28 | 0.28 | 0.28 | 16.90 | 16.90 | 16.90 |
| SOE WL52 | 5 | Oustanding, KNE | Y | 0.38 | 0.17 | 0.66 | 19.00 | 5.16 | 37.90 |
| SOE WL53 | 4 | Significant, KNE | N | 0.11 | 0.10 | 0.12 | 36.00 | 32.50 | 38.80 |
| SOE WL54 | 2 | Significant, KNE | Y | 0.20 | 0.17 | 0.24 | 39.60 | 37.70 | 41.40 |
| SOE WL55 | 1 | Significant, KNE | Y | 0.67 | 0.67 | 0.67 | 7.70 | 7.68 | 7.68 |
| SOE WL56 | 2 | Significant, KNE | Y | 0.36 | 0.10 | 0.62 | 18.50 | 6.77 | 30.30 |
| SOE WL57 | 1 | Significant, KNE | Y | 0.66 | 0.66 | 0.66 | 9.00 | 8.99 | 8.99 |
| SOE WL58 | 3 | Significant, KNE | Y | 0.14 | 0.11 | 0.20 | 33.50 | 25.90 | 38.60 |
| SOE WL59 | 2 | Significant, KNE | Y | 0.88 | 0.88 | 0.88 | 4.30 | 3.94 | 4.71 |
| SOE WL60 | 2 | Significant, KNE | Y | 0.56 | 0.45 | 0.67 | 5.60 | 4.47 | 6.79 |
| SOE WL61 | 1 | Significant, KNE | Y | 0.29 | 0.29 | 0.29 | 8.20 | 8.19 | 8.19 |
| SOE WL63 | 1 | Significant | Y | 0.69 | 0.69 | 0.69 | 6.60 | 6.63 | 6.63 |
| SOE WL65 | 1 | Significant | Y | 0.30 | 0.12 | 0.47 | 18.50 | 18.50 | 18.50 |
| SOE WL66 | 4 | Outstanding, KNE | N | 0.87 | 0.87 | 0.87 | 3.20 | 3.21 | 3.21 |
| SOE WL67 | 2 | Significant | Y | 0.12 | 0.12 | 0.12 | 51.90 | 51.90 | 51.90 |
| SOE WL68 | 2 | Significant | N | 0.19 | 0.15 | 0.23 | 36.60 | 35.50 | 37.70 |
| SOE WL70 | 2 | Significant, KNE | Y | 0.47 | 0.47 | 0.47 | 20.50 | 20.50 | 20.50 |
| SOE WL72 | 1 | Significant,KNE | Y | 0.26 | 0.26 | 0.26 | 12.00 | 12.00 | 12.00 |
| SOE WL73 | 2 | Significant,KNE | Y | 0.72 | 0.66 | 0.77 | 4.70 | 3.58 | 5.87 |
| SOE WL74 | 1 | Significant | Y | 0.14 | 0.14 | 0.14 | 49.80 | 49.80 | 49.80 |
| SOE WL75 | 1 | Significant, KNE | Y | 0.31 | 0.31 | 0.31 | 21.70 | 21.70 | 21.70 |
| SOE WL76 | 1 | Significant | Y | 0.22 | 0.22 | 0.22 | 14.90 | 14.90 | 14.90 |
| SOE WL77 | 1 | Significant | Y | 0.78 | 0.78 | 0.78 | 8.60 | 8.58 | 8.58 |
| SOE WL78 | 2 | Significant,KNE | Y | 0.56 | 0.56 | 0.56 | 38.80 | 37.80 | 39.70 |
| SOE WL79 | 1 | Significant | Y | 0.93 | 0.93 | 0.93 | 4.20 | 4.22 | 4.22 |

## Appendix 2: Wetland vegetation types and the dominance of native species and native vegetation cover in the 5m x 5m plots sampled at each site monitored across the Kapiti Coast whaitua over summer 2017/2018. Sites are numbered (e.g. SOE WL01) and plots are listed as letters (i.e. A, B, C, D and E)

| Plot | Vegetation type | Native species dominance (%) | Native cover dominance (%) |
|---|---|---|---|
| SOE WL50A | Herbfield | 13 | 7 |
| SOE WL50B | Flaxland | 69 | 62 |
| SOE WL50C | Reedland | 62 | 88 |
| SOE WL51A | Flaxland | 50 | 45 |
| SOE WL52A | Sedgeland | 100 | 100 |
| SOE WL52B | Flaxland | 50 | 83 |
| SOE WL52C | Flaxland | 64 | 85 |
| SOE WL52D | Rushland | 38 | 33 |
| SOE WL52E | Sedgeland | 50 | 29 |
| SOE WL53A | Reedland | 57 | 55 |
| SOE WL53B | Sedgeland | 54 | 59 |
| SOE WL53C | Shrubland | 73 | 71 |
| SOE WL53D | Sedgeland | 40 | 59 |
| SOE WL54A | Shrubland | 87 | 96 |
| SOE WL54B | Sedgeland | 56 | 90 |
| SOE WL55A | Forest | 63 | 80 |
| SOE WL56A | Reedland | 55 | 30 |
| SOE WL56B | Grassland | 33 | 46 |
| SOE WL57A | Forest | 93 | 99 |
| SOE WL58A | Flaxland | 80 | 98 |
| SOE WL58B | Forest | 96 | 99 |
| SOE WL58C | Sedgeland | 90 | 96 |
| SOE WL59A | Grassland | 10 | 6 |
| SOE WL59B | Sedgeland | 22 | 63 |
| SOE WL60A | Forest | 94 | 81 |
| SOE WL60B | Sedgeland | 27 | 38 |
| SOE WL61A | Reedland | 40 | 45 |
| SOE WL62A | Sedgeland | 67 | 87 |
| SOE WL63A | Shrubland | 55 | 59 |
| SOE WL64A | Grassland | 50 | 13 |
| SOE WL64B | Shrubland | 63 | 92 |
| SOE WL64C | Sedgeland | 85 | 98 |
| SOE WL65A | Sedgeland | 90 | 98 |
| SOE WL66A | Reedland | 50 | 41 |
| SOE WL66B | Reedland | 64 | 91 |
| SOE WL66C | Sedgeland | 46 | 94 |
| SOE WL66D | Flaxland | 58 | 84 |
| SOE WL67A | Sedgeland | 33 | 51 |
| SOE WL67B | Forest | 90 | 94 |

| Plot | Vegetation type | Native species dominance (%) | Native cover dominance (%) |
|---|---|---|---|
| SOE WL68A | Reedland | 63 | 78 |
| SOE WL68B | Rushland | 63 | 46 |
| SOE WL69A | Sedgeland | 95 | 95 |
| SOE WL69B | Reedland | 67 | 87 |
| SOE WL69C | Rushland | 86 | 96 |
| SOE WL70A | Sedgeland | 40 | 89 |
| SOE WL70B | Rushland | 54 | 34 |
| SOE WL71A | Flaxland | 60 | 90 |
| SOE WL71B | Reedland | 85 | 98 |
| SOE WL72A | Forest | 100 | 100 |
| SOE WL73A | Sedgeland | 46 | 58 |
| SOE WL73B | Reedland | 77 | 91 |
| SOE WL74A | Reedland | 75 | 92 |
| SOE WL75A | Shrubland | 90 | 99 |
| SOE WL76A | Flaxland | 85 | 87 |
| SOE WL77A | Forest | 100 | 100 |
| SOE WL78A | Shrubland | 86 | 98 |
| SOE WL78B | Sedgeland | 64 | 75 |
| SOE WL79A | Shrubland | 86 | 93 |

**Appendix 3: Wetland type and the condition and pressure scores by component for the 30 wetland sites monitored in the Kapiti Coast whaitua over summer 2017/2018. Wetland condition indicators are scored out of 5 and averaged to give a score out of 5 for each component. The five components that make up the Wetland Condition Index are then summed to give a score out of 25 where (<10=poor, 10 ≤ 15=moderate, 15 ≤ 20 =good and >20 =excellent). The pressure index is calculated as the sum of seven indicators, each scored out of 5 to give a score out of 35**

| Site | Wetland type | Indicator component | | | | | Overall condition index | Overall pressure index |
|---|---|---|---|---|---|---|---|---|
| | | Hydrological integrity | Physiochemical parameters | Ecosystem intactness | Browsing and predation | Dominance of native plants | | |
| SOE WL50 | Swamp | 2.83 | 3.50 | 3.50 | 3.83 | 3.17 | 16.83 | 19.50 |
| SOE WL51 | Swamp | 2.50 | 3.25 | 2.67 | 3.67 | 3.33 | 15.42 | 19.50 |
| SOE WL52 | Swamp | 3.00 | 3.63 | 3.33 | 3.58 | 3.92 | 17.46 | 19.25 |
| SOE WL53 | Fen | 2.67 | 3.33 | 3.00 | 3.50 | 3.00 | 15.50 | 21.00 |
| SOE WL54 | Fen | 3.33 | 3.67 | 3.67 | 3.75 | 4.33 | 18.75 | 19.00 |
| SOE WL55 | Swamp | 2.67 | 3.75 | 2.83 | 3.33 | 3.17 | 15.75 | 20.50 |
| SOE WL56 | Swamp | 2.17 | 3.00 | 3.17 | 3.67 | 2.47 | 14.47 | 20.00 |
| SOE WL57 | Swamp | 2.50 | 3.75 | 3.17 | 3.33 | 3.83 | 16.58 | 21.50 |
| SOE WL58 | Swamp | 3.67 | 4.00 | 3.50 | 4.38 | 4.00 | 19.54 | 19.50 |
| SOE WL59 | Swamp | 2.50 | 3.25 | 3.08 | 3.63 | 2.33 | 14.79 | 22.75 |
| SOE WL60 | Swamp | 3.67 | 2.50 | 3.33 | 2.33 | 1.67 | 13.50 | 22.00 |
| SOE WL61 | Swamp | 3.00 | 3.00 | 3.00 | 2.75 | 2.00 | 13.75 | 23.00 |
| SOE WL62 | Swamp | 2.67 | 3.25 | 2.50 | 2.75 | 3.50 | 14.67 | 24.50 |
| SOE WL63 | Swamp | 2.83 | 3.50 | 2.67 | 3.75 | 2.67 | 15.42 | 24.00 |
| SOE WL64 | Saltmarsh | 3.00 | 3.50 | 3.33 | 3.67 | 2.67 | 16.17 | 21.00 |
| SOE WL65 | Fen | 3.67 | 3.67 | 3.33 | 3.25 | 4.00 | 17.92 | 18.00 |
| SOE WL66 | Swamp | 2.92 | 3.00 | 3.67 | 3.33 | 3.33 | 16.25 | 22.50 |
| SOE WL67 | Swamp | 4.00 | 3.33 | 3.33 | 3.17 | 3.67 | 17.50 | 21.00 |
| SOE WL68 | Swamp | 4.00 | 3.50 | 3.00 | 2.75 | 2.67 | 15.92 | 21.00 |
| SOE WL69 | Saltmarsh | 2.83 | 3.75 | 3.67 | 4.00 | 3.83 | 18.08 | 18.50 |

| Site | Wetland type | Indicator component | | | | | Overall condition index | Overall pressure index |
|---|---|---|---|---|---|---|---|---|
| | | Hydrological integrity | Physiochemical parameters | Ecosystem intactness | Browsing and predation | Dominance of native plants | | |
| SOE WL70 | Swamp | 2.83 | 3.75 | 3.33 | 3.75 | 3.00 | 16.67 | 19.50 |
| SOE WL71 | Fen | 3.50 | 3.33 | 3.33 | 3.17 | 3.50 | 16.83 | 21.50 |
| SOE WL72 | Swamp | 2.33 | 4.00 | 3.17 | 4.00 | 3.83 | 17.33 | 20.50 |
| SOE WL73 | Swamp | 3.33 | 3.50 | 3.67 | 3.33 | 3.67 | 17.50 | 22.50 |
| SOE WL74 | Swamp | 3.00 | 2.75 | 2.50 | 3.63 | 3.33 | 15.21 | 21.00 |
| SOE WL75 | Fen | 3.00 | 3.25 | 3.33 | 3.33 | 3.50 | 16.42 | 19.50 |
| SOE WL76 | Swamp | 3.00 | 3.50 | 3.17 | 3.33 | 3.00 | 16.00 | 22.00 |
| SOE WL77 | Swamp | 2.33 | 4.00 | 3.00 | 3.75 | 4.33 | 17.42 | 18.00 |
| SOE WL78 | Fen | 4.00 | 4.00 | 3.67 | 3.50 | 4.00 | 19.17 | 17.00 |
| SOE WL79 | Swamp | 3.67 | 4.00 | 4.33 | 4.75 | 4.00 | 20.75 | 5.00 |