

Memorandum

To: Pete Grogan – Harmony Energy Storage Limited
From: Andrew Briggs, Ecologist – 4Sight Part of SLR
Reviewed & approved for release by: Hamish Dean, Principal Ecologist – 4Sight Part of SLR
Date: 13th February 2023
Subject: Ecological opportunities and constraints at proposed Marton Solar Farm Site.

INTRODUCTION

Harmony Energy Storage Limited is proposing the development of a ~68MWp solar farm ('the site') just off Pukepapa Road near Marton, within the Rangitikei District. As part of the planning and design stage of the project, an assessment of ecological features was undertaken at a preliminary level by 4Sight -Part of SLR. Areas of potential opportunities to undertake restoration plantings to enhance local biodiversity were identified as well as areas of constraints (i.e. areas to avoid, placing solar panels or other infrastructure).

An overview of the site and key features is provided in Figure 1, below.

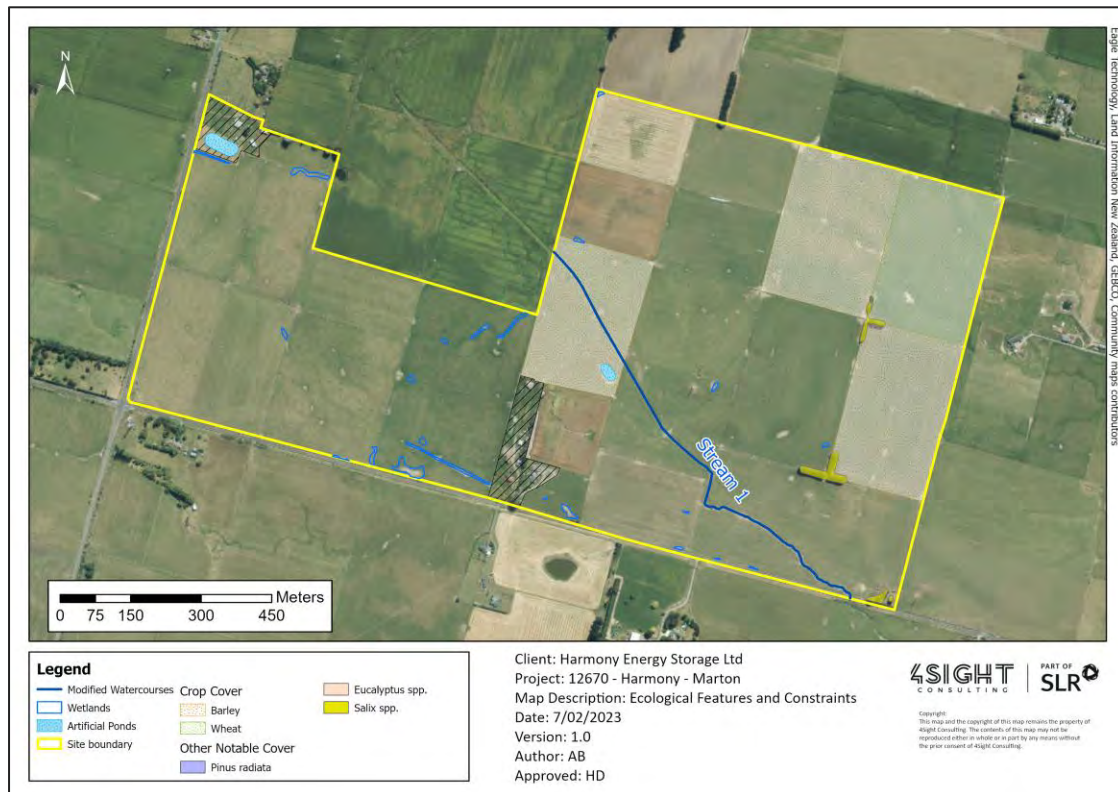


Figure 1: Enhanced site overview of key ecological features. Note that all cover not specifically identified constitutes exotic pasture.

METHODS

A desktop assessment of the area was undertaken prior to an on-site assessment to identify major vegetation types using aerial imagery.

During the field survey (18th – 19th January 2023), potential wetland features of the site were assessed using the wetland delineation protocols developed by the Ministry for the Environment to support the National Policy Statement for Freshwater management (NPS – FM) 2020.

The site assessment was undertaken under 'normal circumstances', with fair weather conditions during the week.

Multiple vegetation plots were implemented in potential wetlands during the site visit where species and cover were recorded per stratum. Based on the data collected, wetland indicator status tests (Dominance Test and Prevalence Test) were undertaken following the wetland indicator status ratings for species. The tests also included a Pasture Test to identify if the plant species found within the plot are considered pasture species or not.

In addition to wetlands, stream and terrestrial habitat types (e.g. shelterbelts and crops) were also mapped. Potential areas of constraint, as well as areas that could have restoration potential, were also identified during the field survey.

In terms of faunal sampling, formal aquatic macroinvertebrate and eDNA sampling was conducted within the stream onsite. Three bat monitors were placed in suitable trees to monitor potential bat activity onsite, birds were observed incidentally whilst potential skink and gecko habitat was checked for habitation, where available.

RESULTS

Terrestrial Habitat

From the site visit and aerial photographs, the site largely encompasses typical rural environments, with vegetation within the site dominated by managed pasture grasses used to graze cattle and sheep (Figure 1). Common pasture grasses observed within this vegetation type included rye grass (*Lolium* spp.) and annual poa (*Poa annua*). Common legumes included white clover (*Trifolium repens*) whilst exotic herbaceous species within pasture included buttercup (*Ranunculus repens*) and broad-leaved dock (*Rumex obtusifolius*).

Tree shelterbelts are located along the fence line of certain paddocks within the greater study site. Key species utilised in the shelterbelts include radiata pine (*Pinus radiata*), gumtrees (*Eucalyptus* spp.) and willow (*Salix* spp.). Four fenced areas within the overall proposed development site comprised crop cover, three of which were barley as well as one wheat field.

Representative images of terrestrial habitat onsite are included in Figure 2, below.



Figure 2: Representative photographs of terrestrial habitat onsite.

Wetlands

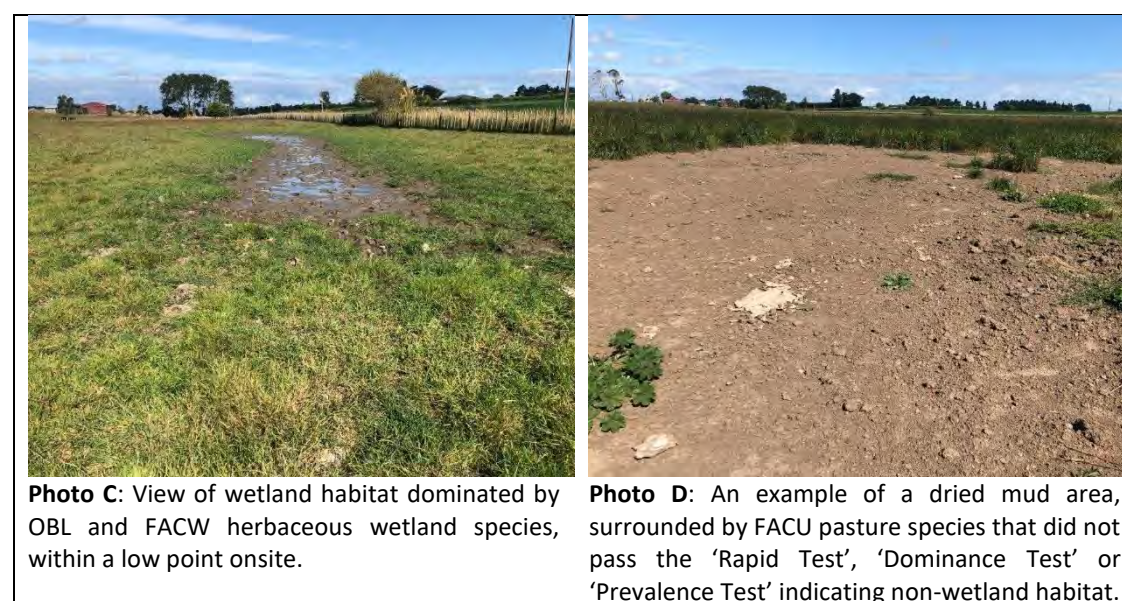
Wetland habitat comprising a variety of obligate wetland (OBL) and facultative wetland (FACW) herbaceous species were scattered throughout the site, primarily within the low points in the landscape. The primary OBL and FACW grasses that were prevalent in wetland areas included creeping bent

(*Agrostis stolonifera*), blue sweet grass (*Glyceria declinata*) and kneed foxtail (*Alopecurus geniculatus*). The 22 identified wetlands were largely identified and delineated using the 'Rapid Test', however, five vegetation plots were implemented onsite to determine the presence of wetland systems in pasture areas where the dominant species were not clearly FACW or OBL.

Certain areas within low points onsite comprised dried out mud, flanked by pasture and wetland grasses. These areas were, however, excluded as wetland habitat in terms of the wetland delineation protocols developed by the Ministry for the Environment (MfE 2020) as they meet the pasture exclusion criteria.

All of the wetlands identified were dominated by exotic species, were highly degraded and were of overall very low quality.

Representative images of wetland habitat onsite are included in [Figure 3 Error! Reference source not found.](#), below.



[Figure 3: Representative photographs of wetland and non-wetland habitat onsite.](#)

Stream

A single seasonally active (intermittent) stream, which flows in a general south easterly direction, was identified within the extent of the study site. The stream was not flowing during the field assessment, instead comprising elongated stagnant pools of murky (turbid) water.

The stream is soft bottomed with generally well vegetated banks and instream areas. Primary marginal vegetation included blue sweet grass, water pepper (*Persicaria hydropiper*), mercer grass (*Paspalum distichum*) and kneed foxtail whilst common submerged aquatic vegetation within the stream reaches included an unknown filamentous algae and curly pondweed (*Potamogeton crispus*).

The stream has been modified through excavation, straightening, diversion, stock trampling as well as through the implementation of pipe culverts for road crossings.

Representative images of stream habitat onsite are included in [Figure 4](#), below

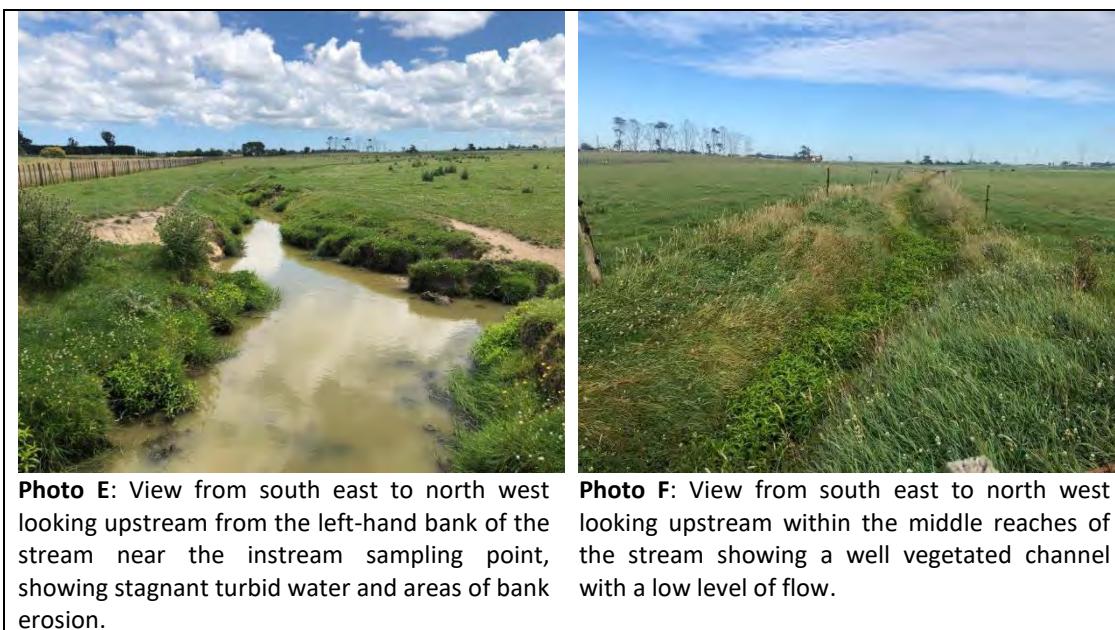


Figure 4: Representative photographs of stream habitat onsite.

Fauna

Bats

The nearest known record of New Zealand Long-tail Bats (*Chalinolobus tuberculatus*) was recorded in excess of 10km northeast of the site within the Turakina area during a survey in 2003 (DOC 2021¹). Three ABMs were placed within tree shelterbelt areas onsite during the site visit in January 2023 to detect any potential bat activity, the results of which will be discussed in the forthcoming Ecological Effects Assessment report for the project.

Birds

All birds seen and heard were noted during the site visit in January 2023, which included a total of 11 common open country bird species comprising six 'Introduced: Naturalised' species and five 'Not Threatened' native species. Given the scope of the project, no further bird monitoring will be undertaken.

Skinks and Geckos

Potential skink and gecko habitat was searched intermittently during the field survey which yielded no specimens. It is highly unlikely that significant skink or gecko populations will be present within the site, due to the limited availability of suitable habitat and history of regular disturbance for farming activities.

Fish

No active electrofishing or fish trapping was undertaken within the site. Environmental DNA sampling was conducted within the stream, the forthcoming results of which should indicate which fish species are utilising the stream onsite. A small range of native fish are potentially utilising the watercourse. A small range of native fish, including longfin / shortfin eels, can be expected within the watercourses.

Macroinvertebrates

A macroinvertebrate sample was collected from the stream, the results of which will be discussed in the forthcoming Ecological Effects Assessment report for the project. No sensitive or unique species are expected.

¹ DOC. 2021. Bat database. Spatial data provided by Department of Conservation. Dated 28 June 2021.

Pest animals

No pest animals were observed onsite although it is likely that pest animals such as hares, rats, possums, cats, mustelids and hedgehogs are present within the general area.

ECOLOGICAL CONSTRAINTS AND OPPORTUNITIES

Wetland and Watercourse Habitat

The majority of the land area onsite, including wetland habitat, is likely to house the proposed solar arrays and necessary infrastructure. The objectives and policies of the NPS-FM include the protection of natural wetlands and the associated National Environmental Standards for Freshwater 2020 (NES-F) require resource consents for works occurring within 10m of a wetland, or discharges occurring within 100m of a natural wetland, and the partial or full drainage or reclamation of a wetland is prohibited, other than under a few specific circumstances. The specific circumstances include for specified infrastructure, and we understand that the proposed solar farm would meet the definition of specified infrastructure. All wetlands onsite have been subjected to varying levels of degradation and are of very low quality. If wetland areas cannot be avoided, the impact of small-scale displacement of soils for the installation of steel poles of the solar array structure is likely to be very low. Identified wetland areas were highly modified and therefore minimal opportunities exist for active restoration of these areas. Impacts to these wetlands can be managed onsite.

Similarly, where stream crossings or culvert extensions are required, under the NPS-FM there is a directive to avoid loss of stream extent or value unless a functional need is demonstrated and adverse effects are managed by applying the effects management hierarchy. Ideally no new culverts should be installed onsite, however, in the case that culvert crossings are required, the lengths will need to be minimised. Additional opportunities to improve fish passage for existing / potential new culverts, fencing off stream areas and vegetating stream banks with indigenous riparian plants should also be considered in the design.

Fauna

The tree shelterbelts bordering some of the pasture areas onsite could potentially provide habitat for New Zealand Long-tail Bats, however, it must be noted that the results of the ABMs set-up onsite are not yet available. Potential effects to bats, birds and lizards linked to proposed construction / operational activities such as direct habitat disturbance, stormwater runoff, artificial lighting, noise and glare, are likely to be low and easily managed onsite. In the case that bats are detected onsite, and the tree shelterbelts are to be removed, additional mitigation measures and investigation will be required prior to any development being undertaken.

SUMMARY AND RECOMMENDATIONS

The proposed development site comprises primarily grazed pasture with tree shelterbelts on the edges of some of the paddocks. An intermittently flowing stream bisects the site, whilst degraded and low value wetland habitat is located sporadically throughout the site. In general the site is highly modified, consistent with a history of pastoral farming. Given the general level of habitat modification, it is likely that the ecological value of ecosystems, habitat and species will be low.

Due consideration to potential enhancement of the identified terrestrial, wetland and stream habitat, as mentioned above, will enable the proposed solar farm project to achieve a net gain in ecological value.

Given the expected low level of effect, no specific recommendations or mitigation is necessary. If a net ecological value gain is desired, the following key initial recommendations include:

- Minimise vehicle movement and construction works within wetland habitat;
- Remove weeds and initiate vegetative restoration of stream banks;
- Fence-off / exclude the stream from stock to assist in passive restoration;
- If bats are detected, avoid removal of tree shelterbelts, where possible; and
- Avoid implementing new culvert crossings, where possible.