BNG Report

Naantali

Project number: 10904673

Client: Neste Oyj

List of changes

Version:	Date:	Description change	Reviewed	Approved
1	7.12.2022	First draft	Erika Jumppanen	Erika Jumppanen
2	11.01.2023	Final draft	Erika Jumppanen	Erika Jumppanen
3	15.10.2023	Updated draft		

Contents

Maps:

Maanmittauslaitos (MML)

Spatial data:

Sweco Finland Oy,

Photos:

Sweco Finland Oy, 2022

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Suomenkielinen tiivistelmä

Tämän raportin tarkoitus on määritellä biodiversiteettiarvo Neste Oyj:n omistamalle alueelle Naantalissa. Tulokset edustavat alueen ekologista tilaa kesällä 2022 ja pätevät ainoastaan tähän ajanjaksoon. Tulevaisuudessa biodiversiteettiarvo voidaan määrittää uudelleen esimerkiksi alueellisen kehityksen myötä ja määrittää muutos biodiversiteetissa.. Selvitysalueen koko on yhteensä noin 35 hehtaaria. Maastotyö suoritettiin lintujen ja kasvien osalta kesäkuussa 2022. Maastotyössä kiinnitettiin erityistä huomiota seuraaviin seikkoihin: luonnonsuojelulain 29 §:n mukaiset luontotyypit, metsälain 10 §:n mukaiset erityisen tärkeät elinympäristöt, vesilain 2. luvun 11 §:n vesiluontotyypit, uhanalaisten luontotyyppien luonnontilaiset tai niiden kaltaiset kohteet, uhanalaisten, harvinaisten ja direktiivilajien esiintymät, linnuston kannalta arvokkaat alueet sekä paikallisesti harvinaiset ja edustavat kohteet. Luontotyyppikuvioita määritettiin yhteensä 26. Kuvioiden biodiversiteettilaskelmat tehtiin mallilla Biodiversity metric calculator 2.0 by Sweco.

Malli ottaa huomioon luontotyyppikuvion erottuvuuden, kunnon sekä yhteyden muihin luontotyyppikuvioihin. Erottuvuus on mitta kuvion todellisesta ekologisesta arvosta. Todellinen ekologinen arvo on sitä korkeampi mitä uhanalaisempi luontotyyppi on tai mikäli sillä on kansallista (esim. Luonnonsuojelulain 64§:n mukainen luontotyyppi) tai kansainvälistä (esim. EU:n luontodirektiivin mukainen luontotyyppi) arvoa. Kuvion kuntoarvio riippuu luontotyyppikuvion laadusta, iästä sekä ihmishäiriön aiheuttamasta määrästä. Kuvion ekologinen yhteys arvioidaan siitä, miten kuvio on yhteydessä muihin luontotyyppikuvioihin. Teoreettinen kuviokohtainen maksimiarvo on 60. Tämä saavutetaan sillä, että kuvion erottuvuus on hyvin korkea (very high), kuvion kunto on hyvä (good) ja kuvion yhteys muihin kuvioihin on hyvä (good).

Tämän raportin korkein saavutettu biodiversiteettiarvo on 27, joka muodostui kuviolle 2. Kuvio 2 edustaa kuivaa kangasmetsää, kuviolla havaittiin vaarantunutta ahokissankäpälää (*Antennaria dioica*, NT) nostaen alueen edustavuutta. Kaksi kuviota sai biodiversiteettiarvon 0. Kaikkien 26 kuvioiden yhteenlaskettu arvo on 260.

Nykyisen arvon ylläpitäminen tai sen kasvattaminen jatkossa on suositeltavaa esimerkiksi muuttamalla mahdollisimman vähän korkeita arvoja saaneita kuvioita ja/tai parantamalla matalan tuloksen saaneiden kuvioiden ekologisia arvoja. Kuvioiden ekologista arvoa on mahdollista nostaa mm. ennallistamalla soita ja metsäalueita, torjumalla vieraslajeja, istuttamalla soveltuvia niittykasveja ja viherkattoja tai lisäten esimerkiksi lintujen pesintämahdollisuuksia sijoittamalla linnunpönttöjä tai tekopesiä alueelle. Tämän raportin tuloksia voidaan hyödyntää maankäytön ja/tai biodiversiteettiarvojen noston suunnittelussa sekä vertailla rakentamisen jälkeisiä tuloksia kesän 2022 tuloksiin.

1. Limitations and expectations

This report and its findings should be considered in relation to the terms and conditions proposed and scope of works agreed between Sweco and the client. Interpretations and recommendations contained in the report represent our professional opinions, which were arrived at in accordance with currently accepted industry practices at the time of reporting and based on current legislation in force at that time.

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This report is prepared and written in the context of the proposals stated in the introduction to this report and should not be used in a differing context. Furthermore, alterations to the initial proposals or changes in conditions on site over time may necessitate an alteration to the report in whole or in part after its submission. Therefore, in the event of any change in proposals or lapse of one year or more from the date of the report, the content of the report should not be relied upon unless referred to Sweco for validation and, if necessary, re-appraisal.

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2. Introduction

2.1   Purpose

The purpose on this report is to assess the biodiversity value of the area owned by Neste Oyj in Naantali, Southern Finland. This report assesses the biodiversity value of the proposed development site prior to any development at its current state during summer of 2022. The results are a representation of the ecological values of the area at a certain time and only that time. In the future the biodiversity value can be assessed for the potential post-development site in order to compare the two (prior to development and post-development) to identify whether the proposed development will result in net gain/loss of biodiversity.

2.2   Site Description

The size of the surveyed area is approximately 35 ha. The area comprises mostly of coniferous forests and mixed deciduous and coniferous forests. There are also, for example, areas artificial and natural ponds. The surveyed area is in the immediate vicinity of industrial area of Neste Oyj. There are also some fences and powerlines located on the site.

The boundary of the site is shown in figure 1 below.

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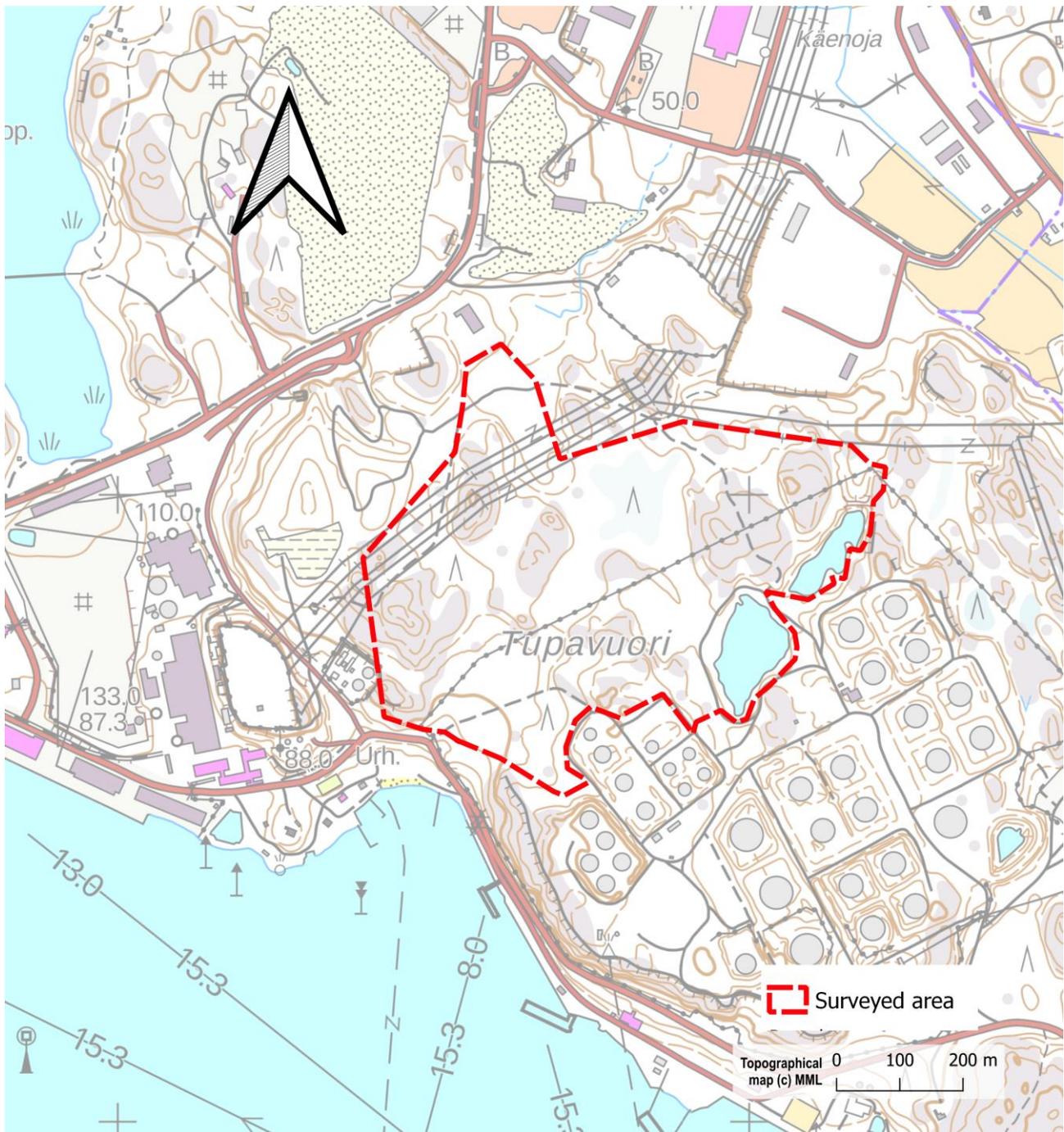
Figure 1. The boundaries of the study site.

2.3   Personnel

This report was produced by Pauliina Teerikorpi PhD (ecology) and Erika Jumppanen MSc (forest ecology) and reviewed by Eeva Punta Phil.Lic. (ecotoxicology).

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2.4 Field work

Field work for on the site was conducted in May-June 2022. Bird species were surveyed once in June. The vegetation survey was conducted in June 2022. Field survey focused on protected habitat types (Nature Conservation act 29§, Forest Act 10§ and Water Act chapter 2, section 11§), endangered habitats in their natural or natural like state and agricultural heritage habitats. Vascular plants were surveyed for species in the Habitats Directive Annex IV(b), species which are part of the cited interest of a national or local nature reserve and any other protected species.

3. Methods

3.1 Technical Approach

The habitats were classified and assessed based on their **habitat distinctiveness, condition and connectivity**. Habitat distinctiveness is a measure of a habitat's intrinsic ecological / biological value. For each habitat parcel distinctiveness is derived from the European Habitats Directive (Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora) and the Finnish Nature Conservation Act 1096/1996 along with the Red List of Finnish species and habitats (2019).

Habitat parcels were classified into their respective categories based on their habitat type and/or endangered species of plants and/or birds found in the area. The classification was made based on field survey results, and by viewing open databases of the Finnish Forest Centre and Natural Resources Institute Finland (Metsäkeskus 2023, Luonnonvarakeskus 2023).

The condition of the habitat depends on the quality, age and lack of human disturbance in the habitat. Habitats with low distinctiveness can achieve good levels of condition, but distinctiveness is dependent on the legal status of the habitat or species existing inside of it.

Lastly connectivity is determined by reviewing the perimeter of the habitat parcel that connects to surrounding connective habitats. Surrounding habitats do not have to be the same habitat type to count towards connectivity, but they must be habitats that contribute to connectivity on a landscape scale. For example, roads, large buildings, felled forests and powerlines affect negatively the connectivity of the habitat.

The biodiversity calculations within this report have been produced using the biodiversity metric calculator 2.0. The theoretical maximum parcel score is 60. This is possible to achieve by having a parcel of very high distinctiveness, good condition and with good connectivity. Theoretically such parcel could be a primeval forest of a very endangered habitat with good connectivity. The lowest score is 0, which is, for example, fully industrial area. The result of each parcel is listed in the annex 1.

For example, the highest score (27) was granted to the parcel 2. The parcel is a dry coniferous forest area where nearly threatened (NT) plant species catsfoot (*Antennaria dioica*) could be found. This fiend raises the distinctiveness to moderate even if the forest type is not endangered. Lowest scores (0) were granted to the parcels 1 and 19. These parcels were under powerlines and landfill sites. Thus, the scoring of the distinctiveness and condition of these parcels was not applicable. In addition, these sites had a low connectivity.

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4. Results

4.1   4.1 Baseline (Pre-construction) Habitats

Habitats identified on site include:

- Urban - Landfill sites

- Urban – Fences

- Urban – Powerline

- Rock - Rock cliffs, ledges and shores, including supralittoral

- Waters - Permanent eutrophic lakes, ponds and pools

- Waters - Highly artificial non-saline standing waters

- Woodland - Mixed deciduous and coniferous woodland

- Woodland - Coniferous Forest

These EUNIS habitat codes in Finnish habitats might not be an exact match, but they are most likely as close as possible when it comes to Finnish nature. The names of these codes are derived from EUNIS (European Nature Information System) and do not yet represent Finnish habitat types accurately. The habitat codes do not affect the value of the observed habitat but act as a quick guide. All evaluations were made based on Finnish laws and directives.

4.1.1   Urban – Landfill sites

There is an excavated plot (parcel 19), which is 0,61 ha in size. The value of this area is low at the moment, but it could be used to plant meadow and other more natural habitats that can be established on such soil.

Habitat condition: N/A.

4.1.2   Urban – Fences

There are fences around the core area of the Neste terminal (old refinery). 15-25 remain inside the fences and the Neste core area, while other parcels remain outside the fences. Around the fences there are remnants of cut trees and cleared vegetation. The distinctiveness is assessed to be very low and the condition poor.

Habitat condition: Poor.

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4.1.3　Urban – Powerlines.

Multiple powerlines cross the surveyed area. As the vegetation needs to be kept cleared under the lines the nature values are presumed to be very low.

Habitat condition: N/A

Figure 2. Powerlines in the study site.

4.1.4　Rock - Rock cliffs, ledges and shores, including supralittoral

The distinctiveness of parcel 9 is low as it is a bare rock cliff. The habitat condition of this parcel moderate.

Habitat condition: Moderate.

4.1.5　Waters - Permanent eutrophic lakes, ponds and pools

There is one natural pond within the survey area, parcel 15. The pond represents eutrophic ponds. The distinctiveness of this parcel is low.

Habitat condition: Moderate

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4.1.6 Waters - Highly artificial non-saline standing waters

There is one highly artificial non-saline standing water formation, which is a parcel 14. The standing water formation was formed as an old landfill area was cleaned in the 2000s. This human-made artificial pond that has a high distinctiveness because of some highly threatened bird species and a poor condition. Noteworthy bird species occurred at the pond were endangered (EN) Eurasian coot (*Fulica atra*), endangered (EN) Horned grebe (*Podiceps auritus*) and critically endangered (CR) Common pochard (*Aythya ferina*). Thus, even though the condition of this artificial pond is poor the high distinctiveness raises its biodiversity value to some extent.

Habitat condition: Poor.

Figure 3. The male Common pochard (*Aythia ferina*) in an artificial pond (parcel 14). The species is critically endangered.

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4.1.7 Woodland - Mixed deciduous and coniferous woodland

There are multiple mixed forests of different sizes and ages in the area. This habitat type is the most common in the survey area including 8 parcels (3, 5, 11, 13, 22-26). The distinctiveness of these parcels is low, and the condition is mostly moderate. The age of the forests varies from 30 to 100 years. These forests are important for many animals functioning as their habitats or ecological corridors, but these forests are not specifically distinctive.

Habitat condition: Moderate.

Figure 4. Mixed deciduous and coniferous woodland in the study site.

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4.1.8 Woodland - Coniferous forest

This habitat type is drier compared to the mixed deciduous and coniferous woodland, and it is the second most common including 19 parcels 2, 6-8, 10, 12, 16-17, 20-21). The distinctiveness is mostly low. However, parcels 2 and 6 contained a nearly threatened (NT) plant species catsfoot (*Antennaria dioica*) raising the distinctiveness to moderate. These dry coniferous habitat type parcels are typical habitats for the species.

Habitat condition: Moderate.

Figure 5. The nearly threatened catsfoot (*Antennaria dioica*) was found inside parcels 2 and 6.

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4.2 Biodiversity Calculation Results

The sum of the habitat unit values of all 26 parcels is 260. The maximum potential score for a single parcel given by the biodiversity toolkit by Sweco is 60, and thus, the maximum theoretical score of the study site is 1 560. Achieving this is impossible in an industrial area like Naantali refinery. The highest parcel score given by this report is 27, which belongs to the parcel 2. The parcel is a dry coniferous forest where near threatened species catsfoot (*Antennaria dioica*). Catsfoot could be also found in parcel 6. Some artificial habitats such as powerlines can be increased in their biodiversity value by, for example, growing some native plants and maintaining a meadow-like habitat under the powerlines or increasing vegetation around manmade ponds. To maintain the sum scores as high as 260 or higher it is advisable to target as little negative changes on parcels with higher scores. These parcels are shown as shades of yellows, oranges and reds in the map of the annexes 2 and 3.

5. Discussion

These 2022 results can be used to compare the results of the future surveys and the current state of the different habitats. The results can, in addition, be used to plan actions that will increase the biodiversity values of the existing habitats or even create new ones. These actions can include rewilding, reforestation, restoration of peatlands, planting of meadows and providing new habitats and/or nesting places for different species like birds, flying squirrels or bats. Also structures like green/brown roofs with native plant species will increase biodiversity in areas where human presence is necessary. Improving the quality of the possible brooks and other streams in the area would be beneficial to many species. This could be done by improving the quality of the water entering the stream and/ or by adding rocks and meandering sections to parts of the stream that are not nature like.

It is important to note that older forests that and are not homogenous in tree species are a great way to improve biodiversity by leaving them untouched and adding the amount of dead wood in the area. Forests are slow growing habitat types that are not easy or quick to establish and therefore are valuable even though not endangered or protected in their current state.

6. Conclusions

Human impact is widely seen in the survey area as the habitat is fragmented by ditches, roads, fences, powerlines, industrial areas, and wastelands. The forests are mostly mixed deciduous and coniferous woodlands or coniferous forests that are well-maintained. The most valuable parcel found in the survey area was a plot dry coniferous forest where catsfoot (*Antennaria dioica*) was found.

Many different bird species were discovered nesting in the survey area. In total, 10 endangered and/or noteworthy bird species were observed. The most valuable parcel in terms of birds was the parcel 14, which is a highly artificial standing water formation. Noteworthy bird species occurred at the pond were endangered (EN) Eurasian coot, endangered (EN) horned grebe and critically endangered (CR) common pochard.

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These results of the 2022 survey can only be used to visualize the current state during the summer 2022 and comparing future evaluations. In addition, the results can be used to plan land use and/or restoration and rewilding areas.

Table 1. Notable species observed during nature surveys in June 2022. IUNC-classifications according to: Hyvärien et al. (2019). EN= Endangered, VU= Vulnerable, NT= Near threatened; LC= Least concern. Dir.= species under the bird directive or nature directive; RS.= Finland's responsibility species.

Species	Organism group	IUCN	Dir.	RS	Erit.	Parcel
Alauda arvensis, **Eurasian skylark, kiuru**	Aves	NT				1
Antennaria dioica, **catsfoot, ahokissankäpälä**	Flora	NT				2, 6
Aythya ferina, **common pochard, punasotka**	Aves	CR				14
Bucephala clangula, **common goldeneye, telkkä**	Aves	LC		X		14, 18
Emberiza schoeniculus, **Reed bunting, pajusirkku**	Aves	VU				14
Fulica atra, **Eurasian coot, nokikana**	Aves	EN				14
Garrulus glandarius, **Eurasian jay, närhi**	Aves	NT				23
Motacilla alba, **White wagtail, västäräkki**	Aves	NT				14
Pica pica, **Eurasian magpie**	Aves	NT				2, 28
Sylvia communis, **Common whitethroat, pensaskerttu**	Aves	NT				1
Tetrastes bonasia, Hazel grouse, pyy	Aves	VU	X			3

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Annex 1. A list of parcels and habitat unit values.

Annex 2. A map of parcel scores scaled from 0 to 27.

Annex 3. A map of parcel scores scaled from 0 to 60.

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Parcel Reference	Eunis Habitat Name	Distinctiveness	Condition	Connectivity	SCORES
1	Constructed, industrial and other artificial habitats	Not applicable	N/A	Moderate	0
2	Coniferous forest	Moderate	Good	Moderate	27
3	Mixed deciduous and coniferous woodland	Moderate	Moderate	Moderate	18
4	Fences	Very low	Poor	Low	2
5	Mixed deciduous and coniferous woodland	Low	Moderate	Moderate	12
6	Coniferous forest	Moderate	Moderate	High	24
7	Coniferous forest	Low	Moderate	Moderate	12
8	Coniferous forest	Low	Moderate	Moderate	12
9	Rock cliffs, ledges and shores, including the supralittoral	Low	Moderate	Moderate	12
10	Coniferous forest	Low	Moderate	Moderate	12
11	Mixed deciduous and coniferous woodland	Low	Poor	Moderate	6
12	Coniferous forest	Low	Moderate	Low	8
13	Mixed deciduous and coniferous woodland	Low	Moderate	Moderate	12
14	Highly artificial non-saline standing waters	Very high	Poor	Moderate	15
15	Permanent eutrophic lakes, ponds and pools	Low	Moderate	Moderate	12
16	Coniferous forest	Low	Poor	Low	4
17	Coniferous forest	Low	Poor	Moderate	6
18	Highly artificial non-saline standing waters	Low	Poor	Moderate	6
19	Household waste and landfill sites	Not applicable	N/A	Low	0
20	Coniferous forest	Low	Moderate	Moderate	12
21	Coniferous forest	Low	Moderate	Low	8
22	Mixed deciduous and coniferous woodland	Low	Moderate	Low	8
23	Mixed deciduous and coniferous woodland	Low	Moderate	Moderate	12
24	Mixed deciduous and coniferous woodland	Low	Poor	Low	4
25	Mixed deciduous and coniferous woodland	Low	Moderate	Low	8
26	Mixed deciduous and coniferous woodland	Low	Moderate	Low	8

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Annex 2. A map of parcel scores scaled from 0 to 27.

Parcel score

- 0
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 6
- 6 - 7
- 7 - 8
- 8 - 9
- 9 - 10
- 10 - 11
- 11 - 12
- 12 - 13
- 13 - 14
- 14 - 15
- 15 - 16
- 16 - 17
- 17 - 18
- 18 - 19
- 19 - 20
- 20 - 21
- 21 - 22
- 22 - 23
- 23 - 24
- 24 - 25
- 25 - 26
- 26 - 27

Topographical map (c) MML

0   100   200 m
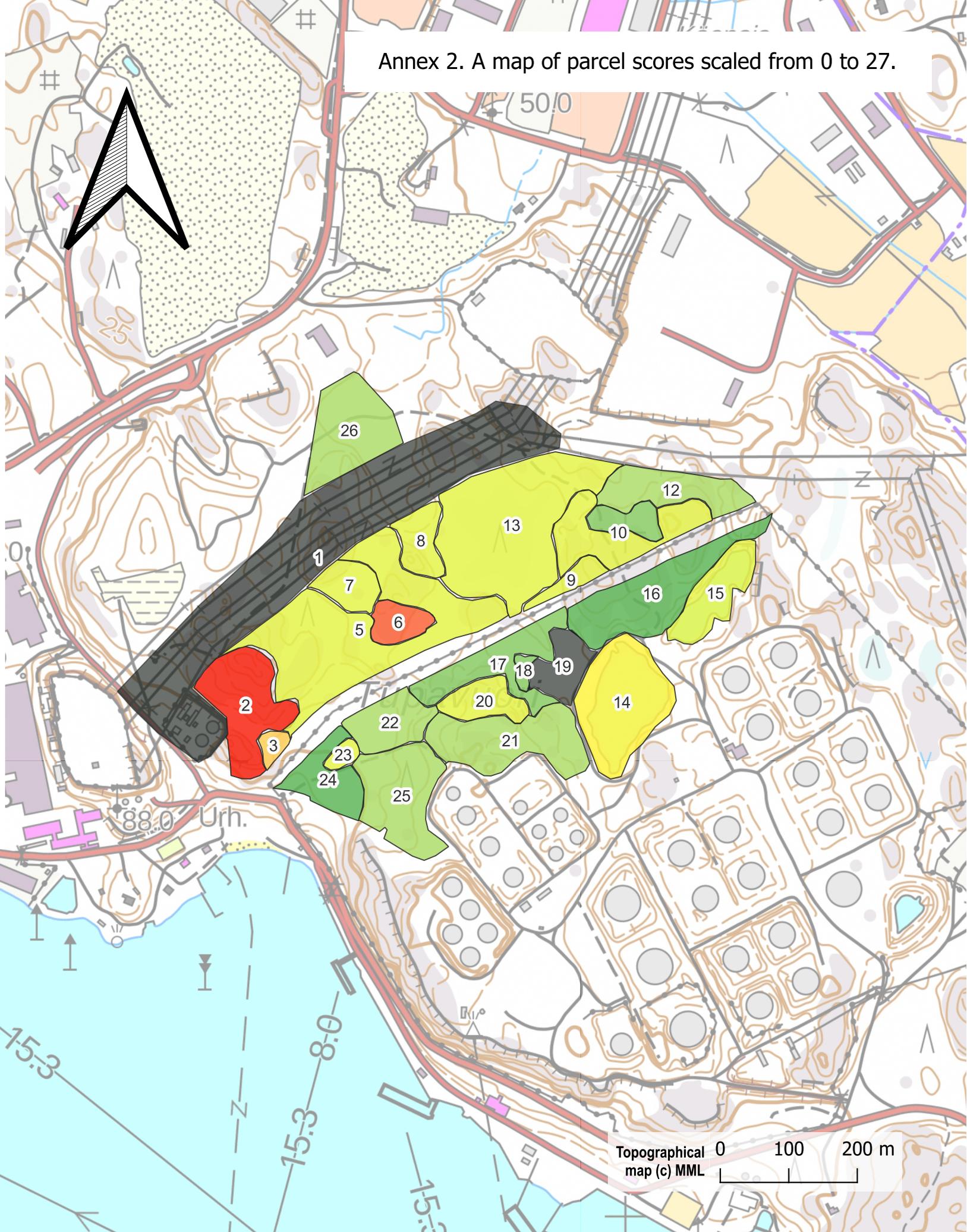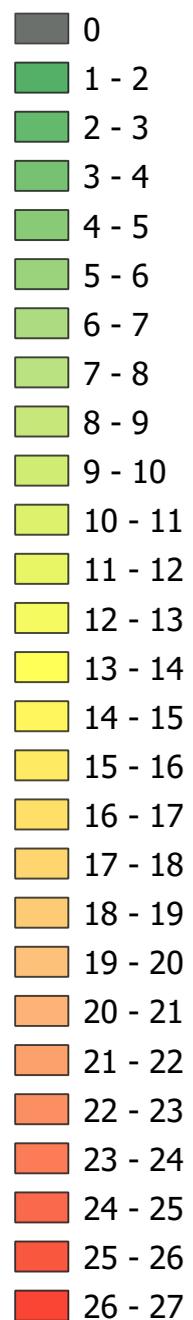
Annex 3. A map of parcel scores scaled from 0 to 60.

Parcel score
- 0
- 1- 3
- 3 - 4,5
- 4,5 - 6
- 6 - 7,5
- 7,5 - 9
- 9 - 10,5
- 10,5 - 12
- 12 - 13,5
- 13,5 - 15
- 15 - 16,5
- 16,5 - 18
- 18 - 19,5
- 19,5 - 21
- 21 - 22,5
- 22,5 - 24
- 24 - 25,5
- 25,5 - 27
- 27 - 28,5
- 28,5 - 30
- 30 - 31,5
- 31,5 - 33
- 33 - 34,5
- 34,5 - 36
- 36 - 37,5
- 37,5 - 39
- 39 - 40,5
- 40,5 - 42
- 42 - 43,5
- 43,5 - 45
- 45 - 46,5
- 46,5 - 48
- 48 - 49,5
- 49,5 - 51
- 51 - 52,5
- 52,5 - 54
- 54 - 55,5
- 55,5 - 57
- 57 - 58,5
- 58,5 - 60

Topographical map (c) MML