NATTOURS

# Combined report of visitor surveys in 2016

Deliverable 2.9.1

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Deliverable 2.9.1
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# Summary of the results

## On-site visitor interviews

### I Visitors' general profile

- ✓ Altogether **634 people** responded to the on-site visitor questionnaires in five urban green areas of Tallinn and Helsinki during the period of September-October 2016. **60%** were female and **40%** male respondents, in the age of **16 to 83**.

- ✓ The starting point to come to the green area was predominantly **the same city district** where the destination green area was located. Only the starting point to Harakka Island varied more evenly in Helsinki, since there were more organised groups among the visitors.

- ✓ The average travelling time of the respondents was **22 to 29 minutes** to Paljassaare, Rocca al Mare, Kadriorg and Pornaistenniemi-Lammassaari. Thus it was suitable length of time for most of the respondents to come **by walking or biking** to the green areas, except to Paljassaare where the largest share of respondents arrived by car (48%). To Harakka Island the average travelling time was 50 minutes and it is only possible to reach there by ferry.

- ✓ **In most of the sites, more respondents came in groups than alone** to the green area. However, in Pornaistenniemi-Lammassaari an equal share of respondents came alone (50:50) and in Rocca al Mare almost equal share came alone (51:49).

- ✓ The majority of respondents **had known of the site for a long time** before their visit and had been there previously as well. In Harakka Island, the majority of respondents were visiting the site **for the first time** (67%).

### II Motives to visit the green area

- ✓ The most common reason for visits to the green area on the interview day was **walking or resting in nature**. This was stated by 60% of the respondents in Paljassaare, 56% in Rocca al Mare, 68% in Kadriorg, 75% in Pornaistenniemi-Lammassaari and 67% in Harakka Island. Also in the case of the previous visits, this activity was the most often mentioned reason.

- ✓ The second most frequent reasons were "**to take care of my health and well-being**" in Paljassaare, "**to sport, jog or rollerscate**" in Rocca al Mare, "**to walk the dog**" in Kadriorg, "**to watch birds**" in Pornaistenniemi-Lammassaari and equally "**to study**" and "**to take photos**" in Harakka Island.

- ✓ By grouping the visiting reasons into four categories (recreational; mental and physical wellbeing; nature experience activities; everyday activities), the most common group of reasons in four out of five green areas were related to **nature**

**experience activities** (about 50–60%). In Rocca al Mare, the main visiting motive for the largest share of respondents (46%) was activities related to **mental and physical wellbeing**.

- ✓ According to **age groups**, nature experience activities were clearly the most common visiting reason in all of the studied green areas for people over 60. In other age groups, there were differences by sites.

- ✓ By dividing the reasons of previous visits between **cultural and provisioning ecosystem services**, Paljassaare stands out as an urban green area where provisioning services were mentioned considerably more often (fishing – by 15%; berry picking, mushroom or herb gathering – by 9% of the respondents) than in other green areas (by up to 2% of the respondents).

### III Temporal and spatial use of the green area

- ✓ The most common duration of a visit to the green area was **1 to 2 hours.** In Harakka Island, where there were more organised groups than in other sites, the majority of visits (58%) lasted **2 to 5 hours or more** and none of the respondents came there for less than an hour.

- ✓ Most of the respondents were **repeat-visitors** of these green areas (in Paljassaare 89%, in Rocca al Mare 96%, in Kadriorg 95%, in Pornaistenniemi-Lammassaari 85%). The **first-time** visitors prevailed in Harakka Island (67%).

- ✓ Most of the respondents reported **at least monthly use of the green area** (in Paljassaare 83%, in Rocca al Mare 87%, in Kadriorg 68%, in Pornaistenniemi-Lammassaari 66%). In Harakka Island, the largest group of respondents (85%) visited the island less frequently.

- ✓ The most frequently reported time for the green area visit in Tallinn was **weekend** (in Paljassaare 70%, in Rocca al Mare 72%, in Kadriorg 71% of the respondents), while in Helsinki **working days** were mentioned more often (in Pornaistenniemi-Lammassaari 76%, in Harakka Island 67% of the respondents).

- ✓ Rocca al Mare, Kadriorg and Pornaistenniemi-Lammassaari are **visited destinations** for most of the respondents **throughout a year** (respectively 49%, 54% and 53%). In Paljassaare, there were slightly more those who preferred summer months (49%) and in Harakka Island, the most often stated visiting season by frequent visitors was autumn (47%).

- ✓ Those who visit **Paljassaare almost every day** are people who come there alone and their motives are related to recreational and everyday activities. They are more likely male. Their average age is 56,8 which is higher than the average age of Paljassaare sample (41,7).

- ✓ In **Rocca al Mare**, it is likely that everyday visitors come on foot or by public transport, either alone or with family members. Their motives are related to everyday activities, they are female and their average age is the same as of the Rocca al Mare sample (35,7 years).

- ✓ In **Kadriorg**, likely daily visitors are people who come on foot, plan to be at the site less than an hour, visit on working days and their visits motivated by everyday activities (going to work, walking the dog, etc). They are more likely to be men and their average age is 41 (compared to the Kadriorg sample's average age of 38).

- ✓ In **Pornaistenniemi-Lammassaari**, everyday visitors most likely come on foot, and usually for less than one hour. The visits are motivated by everyday activities and nature experience. The average age of the sample was 44,7 years, and that for everyday visitors of this site was 53,8 years. In Harakka Island, none of the respondents visited the island almost every day.

- ✓ At least three fourths of the respondents **visited more than one part of the respective green areas**. Rocca al Mare is a green area where the majority of respondents used its promenade and relatively few visited other parts beside the promenade (29%).

## IV Site's nature: preferences, satisfaction and expectations

Infrastructure and services

- ✓ Most of all the respondents would like **more trails and maps** to get information on the nature of the site. Specifically, hiking and walking trails were the most preferred and map with trails came in at second place in Paljassaare, Rocca al Mare and Pornaistenniemi-Lammassaari. In Harakka Island, nature study trails and guided nature tours were the two most desired sources for information. In Kadriorg, there were slightly more respondents who were satisfied with the current situation and were not lacking anything, followed by visitors who would have liked trail maps.

- ✓ The respondents were generally **more satisfied with the current quality of walking trails and birdwatching towers/places** where these existed and slightly **less satisfied with information boards** and in some cases with benches (Paljassaare and Pornaistenniemi-Lammassaari). In Rocca al Mare, it was only possible to assess the quality of walking trails and benches, both received relatively high average scores (over 4,25 on a 5-point scale). In Kadriorg, walking trails and benches received higher average scores than information boards (3,28). In Harakka Island, the respondents were more satisfied with birdwatching places, benches and walking trails and slightly less with information boards (3,84).

- ✓ In Paljassaare and Rocca al Mare, those who had been visiting the site for less than two years **assessed the quality of walking trails as being higher** than the ones

who had been visiting the site for several years. In the case of **information boards**, the results were the opposite in Paljassaare: **newcomers assessed their quality as being lower** (3,0 vs 3,44).

- ✓ In Paljassaare and Kadriorg, Estonian and Russian people were more satisfied and others (foreigners) were less satisfied with the quality of **information boards**.

Nature management activities

- ✓ In the question about nature management activities at the sites, the respondents were also **least satisfied with the availability of nature information**. They were most satisfied with the level of site's **nature protection** (in Paljassaare, Rocca al Mare and Harakka), with the site's **attractiveness** (in Kadriorg and Pornaistenniemi-Lammassaari) and with the site's **safety** (in Pornaistenniemi-Lammassaari).

- ✓ In Rocca al Mare, **females assessed the level of nature protection and attractiveness as being higher** than males.

- ✓ In Kadriorg, the **safety of the site was assessed as being lower by females** (4,02) compared to males (4,32) **as well as by Estonians** (4,03) compared to Russians (4,25) and other nationalities (4,75). Russians regarded Kadriorg cleaner, more accessible and providing information better than Estonians and other nationalities.

- ✓ In Harakka Island, **access to the site was assessed as being higher by females** (4,4) than by males (3,7).

- ✓ In Pornaistenniemi-Lammassaari, **Finns assessed the level of nature protection as being lower** (4,07) than other nationalities (4,6).

- ✓ **Older people assessed some aspects of nature management as being lower than younger people**: the level of nature protection and cleanliness in Pornaistenniemi-Lammassaari; cleanliness, availability of nature information and safety in Harakka Island.

- ✓ In total, the majority of the responses indicated **satisfaction with the current size, appearance, amount of visitors and development of the natural areas within the sites**. The most divergent opinions can be observed in Paljassaare on the question of how developed the green area is: 52% answered that the site has been developed enough, while in the opinion of 48% respondents – too little.

Ecosystem services

- ✓ The most important possibilities that urban green areas can offer in Tallinn/Helsinki are in the opinion of the respondents the following: **spending free time/relaxing** (for the respondents of Paljassaare and Kadriorg), **breathing fresh air** (for the respondents of Rocca al Mare) and **enjoying nature views** (for the respondents of Pornaistenniemi-Lammassaari and Harakka).

- ✓ The respondents regarded provisioning services as the least important ecosystem services of urban green areas: possibility to pick berries, herbs or mushrooms.

- ✓ Most of all the respondents **are satisfied with** the following possibilities **at each site**: **breathing fresh air** (in Paljassaare, Rocca al Mare and Pornaistenniemi-Lammassaari), **spending free time** (in Kadriorg) and **enjoying nature views** (in Harakka Island).

- ✓ **Females assessed the importance of certain possibilities higher than males:** spending free time in Rocca al Mare, Pornaistenniemi-Lammassaari and Harakka Island; enjoying nature views in Rocca al Mare; learning about nature as well as listening to nature sounds in Rocca al Mare and Kadriorg; watching wildlife in Rocca al Mare; picking berries and other wild food products in Harakka Island; doing sports/exercising in Kadriorg and Pornaistenniemi-Lammassaari; going for hobbies in Kadriorg; breathing fresh air in Rocca al Mare, Kadriorg and Pornaistenniemi-Lammassaari; being in tranquillity in Rocca al Mare and Kadriorg.

- ✓ **Older people** assessed the importance of **watching wildlife** (in Rocca al Mare, Kadriorg and Harakka Island) **and getting into the shade** on hot summer days (in Paljassaare, Rocca al Mare, Kadriorg) higher than younger people.

- ✓ A pattern appeared that the nationality group "other" (excl. Estonians, Russians and Finns) **valued the activities related to nature more highly than local people**. This is true with the following activities: listening to nature sounds, watching wildlife, and picking berries.

- ✓ **Respondents with a longer site visiting history are more satisfied** with possibilities to spend free time (in Paljassaare and Rocca al Mare), to learn about nature (Harakka) and to watching birds (Paljassaare).

- ✓ All sites are valued very highly for their **contributions to mental and physical health**. Out of the six potential benefits, health benefits were ranked highest in Tallinn sites. Pornaistenniemi-Lammassaari is especially valued site for its **aesthetic importance and inspiration**. Harakka Island was perceived to play the most important **role in environmental education** for the city inhabitants and tourists.

Electronic counting

- ✓ An electronic counter on the main road of Paljassaare Bird Conservation Area counted on average **88 visitors per day** during July and August 2016 and **31 people per day** during September–November 2016.

- ✓ **Summer is the most popular season and weekend the favourite time** for people to visit Paljassaare.

- ✓ **On weekdays**, the majority of people went to Paljassaare green area either **in the evening or in the morning**, **on weekends** mostly during the **daytime**.

**Mobile positioning survey**

- ✓ According to the mobile phone call activities in September 2016, **daily average number of visitors** in **Paljassaare peninsula** was **1323** and in **Kadriorg park area – 3313**.

- ✓ There were **more visitors** in these areas **on working days** than on weekends, since the coverage areas of mobile antennas are larger than Paljassaare and Kadriorg green area and it is not possible to differentiate between the visitors of green areas and those who visit the nearby commercial or industrial and residential areas.

- ✓ The **average daily number** of visitors during September **weekends** in Paljassaare was **841**, of whom 84% were domestic tourists and 16% foreign tourists. In Kadriorg, the respective number was **2254**, split between 95% of domestic tourists and 6% foreign tourists. The number of weekend visitors should reflect more accurately the green area visitors in Paljassaare and Kadriorg.

- ✓ The most frequent **country of origin of foreign tourists** in September 2016 in both Paljassaare and Kadriorg was **Finland**, respectively 68% and 62% of all foreign tourists. In Paljassaare, Finland was followed by Latvia (8%), Sweden (6%), Lithuania (4%), Russia and Norway (both 2%). In Kadriorg, the rest of the more frequent countries were Latvia (6%), Sweden (5%), Great Britain (4%), Lithuania and Russia (both 3%).

- ✓ **Of domestic tourists** 61% in Paljassaare and 69% in Kadriorg were from **Tallinn**. Other places of residence of the domestic tourists were neighbouring municipalities of Tallinn: Viimsi, Harku and Maardu (all 3%) and Rae (2%) for Paljassaare tourists; Maardu, Viimsi and Rae (all 4%) and Jõelähtme parish (2%) for Kadriorg tourists.

- ✓ In Kadriorg, contrary to expectations, there were **fewer tourists from abroad** (at least 2350) than in Paljassaare (at least 3617) in September 2016. One explanation to this may by **tourist ships passing by Paljassaare**.

- ✓ Other places in Estonia where the foreign tourists who visited Paljassaare and Kadriorg also went mostly indicate to the routes **Tallinn-Pärnu, Tallinn-Tartu, Tallinn-Rakvere**. An exception is Viimsi parish which may refer to ship routes in Tallinn Bay used by Finnish and Swedish tourists.

# 1. On-site visitor interviews

## 1.1. Aim

The aim of the on-site visitor interviews in the NATTOURS project is to get to know more about the visitors of five urban green areas in Tallinn and Helsinki, their routes, destinations, and the reasons for their visit, their current knowledge of ecosystem services, interests, as well as their preferences in terms of investments.

The baseline information about visitor characteristics, motives, satisfaction and use of urban green areas was gathered in the visitor interviews in 2016. There will be a second round of interviews in 2018, which will also be used to partially assess the project's impact.

The interviews in 2016 covered the following broad topics: who the visitors are, when, why and what specific areas they visit, how environmental information can be delivered, how the visitors value the current state of green areas and how potential future investments affect it.

The analysis of the survey results has given insights into some of the use patterns and visitor groups of the green areas. Input from the visitor interviews will also be used in the ecosystem services study of the NATTOURS project to determine how people value the ecosystem services at each site.

### 1.1.1. Previous visitor surveys in NATTOURS focus sites

This study builds on earlier visitor surveys in **Paljassaare**, Estonia, and in **Viikki**, Finland which have used different visitor study methodologies. In Paljassaare, the previous visitor survey was conducted in May 2012 for planning the management of Paljassaare urban recreational area (Reimann et al. 2013). The survey consisted of 163 on-site interviews which explored visitor and visit profiles, visitors' activities, motives, needs, satisfaction, etc.

In Viikki, the visitor survey was carried out in the frames of drawing up the management plan for the Viikki-Vanhankaupunginlahti Natura 2000 nature reserve during May–July 2014 (Yrjölä et al. 2016). The nature reserve includes Pornaistenniemi-Lammassaari which is one of the focus areas in the current study. In the 2014 survey, 408 respondents filled in the visitor questionnaires which looked into the motives and expectations of visitors, routes that different types of visitors prefer to use, their favourite and least favourite spots, etc.

## 1.2. Methodology

The first visitor survey interviews of the NATTOURS project were conducted during the period of **September–October 2016** in five urban green areas of Tallinn and Helsinki (Table 1).

Respondents were randomly selected among the visitors (adults and youngsters) of the natural areas within the sites, i.e. those who obviously had other aims for their visit (e.g. going to a museum, café) were excluded from the sample.

Altogether **634 people** responded to the visitor survey interviews. The number of respondents at each site ranged from 61 to 162 (Table 1). However, as not all of respondents answered all of the survey questions, the total number of answers in each question may be slightly smaller.

*Table 1. Sites, location, time period and sample size of the interviews*

| City | Site | Location of interviews | Interview period | Sample size |
|---|---|---|---|---|
| Tallinn | Paljassaare Bird Conservation Area | Surroundings of wooden (reed bed) bird watching tower | 18-28 September | 160 |
| Tallinn | Rocca al Mare | Promenade | 15 Sept. – 2 Oct. | 162 |
| Tallinn | Kadriorg Park | Central part by the wooded meadow and broadleaf forest | 17-28 September | 148 |
| Helsinki | Pornaistenniemi-Lammassaari | Pornaistenniemi | 16 Sept. – 10 Oct. | 103 |
| Helsinki | Harakka Island | Northern part of the island | 9 Sept. – 25 Oct. | 61 |
| Total sample size | | | | 634 |

The interviews were conducted near the entrance to the green areas or near the most natural area of the site (Kadriorg, Rocca al Mare) (Table 1).

The interviews took place on both **weekdays and weekends** (Figure 1), as well as during **different hours of the day** (Figure 2).

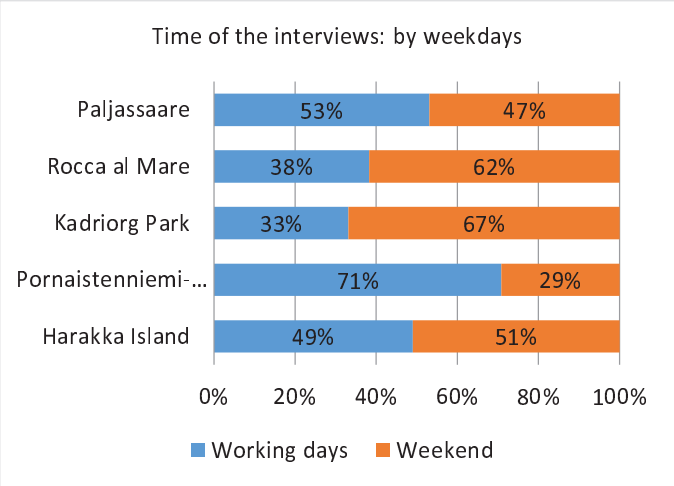



*Figure 1. Division of interviews between working days and weekend*

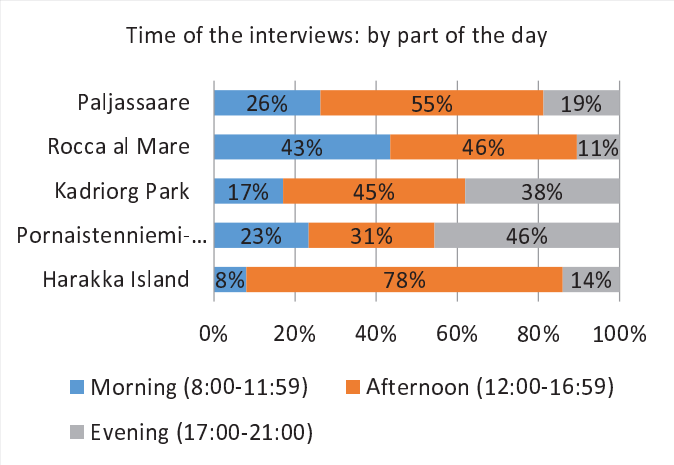



*Figure 2. Division of interviews between different hours of the day*

The questionnaires were **filled in either by the interviewers or the respondents themselves.** However, more responses were received with the first method and therefore only this approach should be used in the next on-site visitor survey (spring 2018). The questionnaire included **22 questions**, divided into five sections (Table 2).

*Table 2. Structure of the questionnaire*

| Topic | Number of questions |
|---|---|
| I General questions about the visitor | 2 + 1 subquestion |
| II Questions about this visit | 6 |
| III Questions about the visitor's previous visits to the site | 5 |
| IV Nature of the site: visitor's preferences, expectations and satisfaction | 6 + 1 subquestion |
| V Concluding questions | 3 |
| Total | **22 (24)** |

The responses were asked are in single- or multi-choice format, in ordinal or ranking scale. In some questions, the interviewees were asked to open their responses with comments (see Annex).

In Paljassaare, Rocca al Mare and Kadriorg Park, the interviews were carried out by 10 students of recreation management from Tallinn University; in Pornaistenniemi-Lammassaari and Harakka Island by two local nature guides of Ympäristötutkimus Yrjölä Oy. The interview questionnaires were available in Estonian, Russian and English languages in Tallinn; in Finnish and English in Helsinki.

Statistical data analysis was done with Stata software and differences in average values of respondent groups were assessed based on Kruskal-Wallis test statistic.

The results are described and summarised below by the main topics of the questionnaire: 1) visitors' general profile; 2) motives to visit green areas; 3) temporal and spatial use of green areas and 4) site's nature: preferences, satisfaction and expectations.

## 1.3. Results

### 1.3.1. Visitors' general profile

Out of all respondents, female visitors were in prevalence (**60%**), only in Paljassaare more than half of the respondents were men (55%, Figure 3).

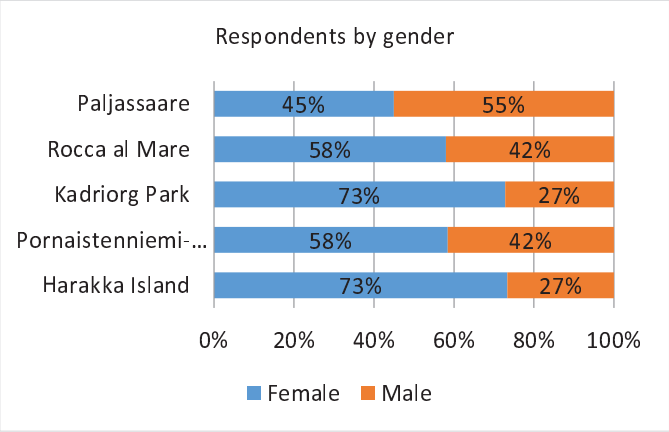
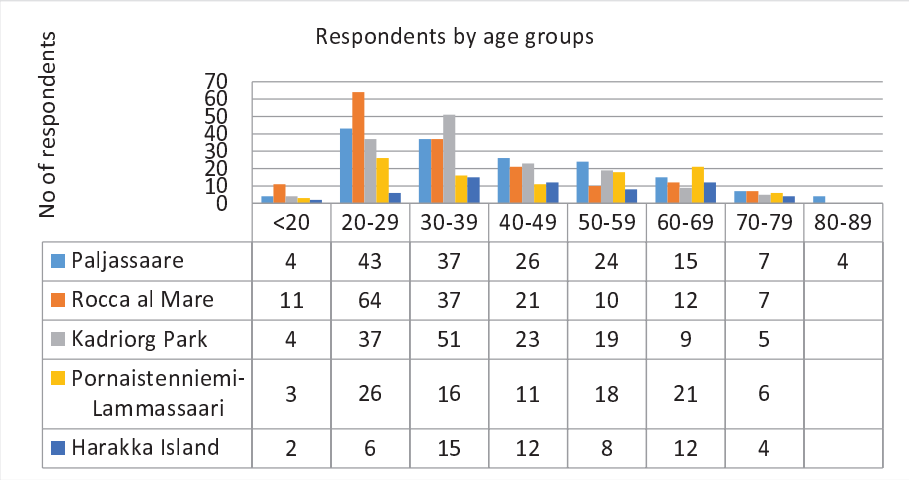



*Figure 3. Respondents by gender*

The age of respondents ranged from **16 to 83** and the median age of the total sample was **38 years**. In Paljassaare, Rocca al Mare and Pornaistenniemi-Lammassaari, the most numerous age group was **20–29**; in Kadriorg and Harakka Island it was from **30 to 39** (Figure 4).




| | <20 | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-79 | 80-89 |
|---|---|---|---|---|---|---|---|---|
| Paljassaare | 4 | 43 | 37 | 26 | 24 | 15 | 7 | 4 |
| Rocca al Mare | 11 | 64 | 37 | 21 | 10 | 12 | 7 | |
| Kadriorg Park | 4 | 37 | 51 | 23 | 19 | 9 | 5 | |
| Pornaistenniemi-Lammassaari | 3 | 26 | 16 | 11 | 18 | 21 | 6 | |
| Harakka Island | 2 | 6 | 15 | 12 | 8 | 12 | 4 | |

*Figure 4. Respondents by age groups*

The **majority of respondents** in Tallinn were **Estonians** and in Helsinki **Finns** (Figure 5). Other nationalities in Tallinn included Ukrainians and Finns (both 4 people); Lithuanians (3); an Armenian, an Englishman, a Georgian, a German, an Irish, a New Zealander and a Norwegian. In Helsinki there were Chinese (3), Australians (2), an American, a Czech, a Dutch, an Estonian, a Frenchman, a Hungarian, a Swiss and a Turk among the respondents.

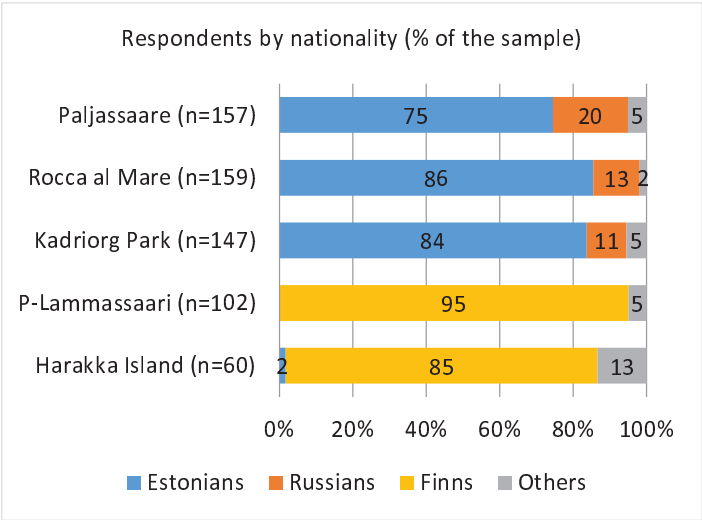



*Figure 5. Respondents by nationality*

The **majority of respondents** in Tallinn and Helsinki green areas were also the **residents of these cities** (Figure 6). Harakka Island is distinguished by a higher share of tourists (visitors who live outside Helsinki – 27%, and abroad – 10%).

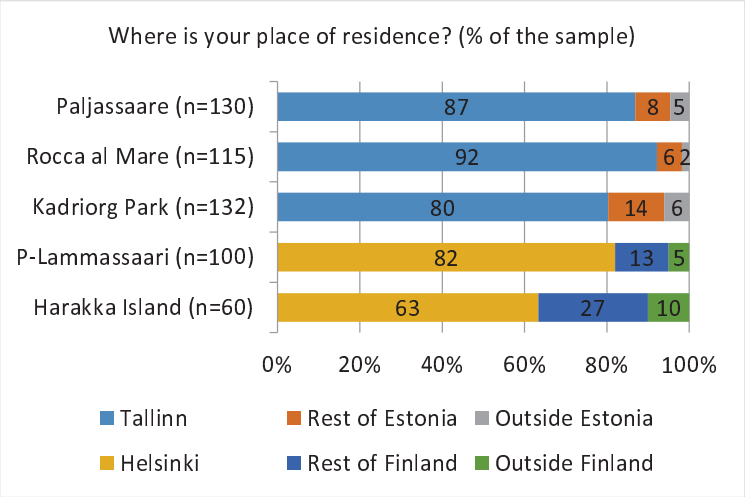



*Figure 6. Respondents by place of residence*

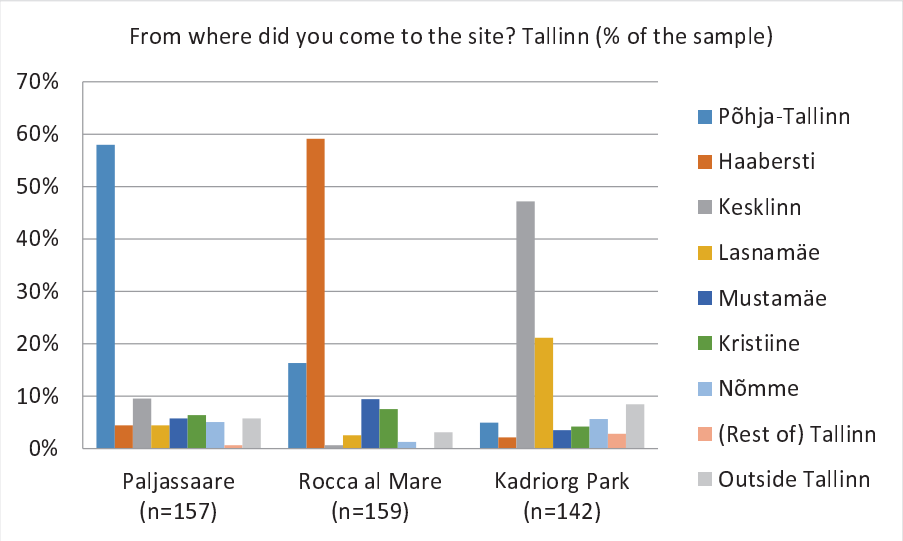
#### 1.1.1.1. From where the respondents came to the green area

First of all, the respondents were asked to indicate from which city district/street they came to the green area (Q1) and how long it took to come there (Q1a). The responses are analysed here according to the city districts which were determined based on the subdivisions of Helsinki[1] and Tallinn[2] if the response was given on a higher level of precision.

**The starting point to come to the green area** (Q1) was predominantly the same city district where the destination – green area – was located (Figure 7). In Harakka Island it varied more as there were more organised groups among the visitors.

In Tallinn, the majority of respondents came to Paljassaare from Northern-Tallinn (58%), to Rocca al Mare from Haabersti (59%) and to Kadriorg from City Centre (47%). In Helsinki, the largest share of visitors to Pornaistenniemi-Lammassaari came from Central district (56%) and to Harakka Island from Southern district (27%).

[1] https://en.wikipedia.org/wiki/Subdivisions_of_Helsinki
[2] http://www.tallinn.ee/eng/districts



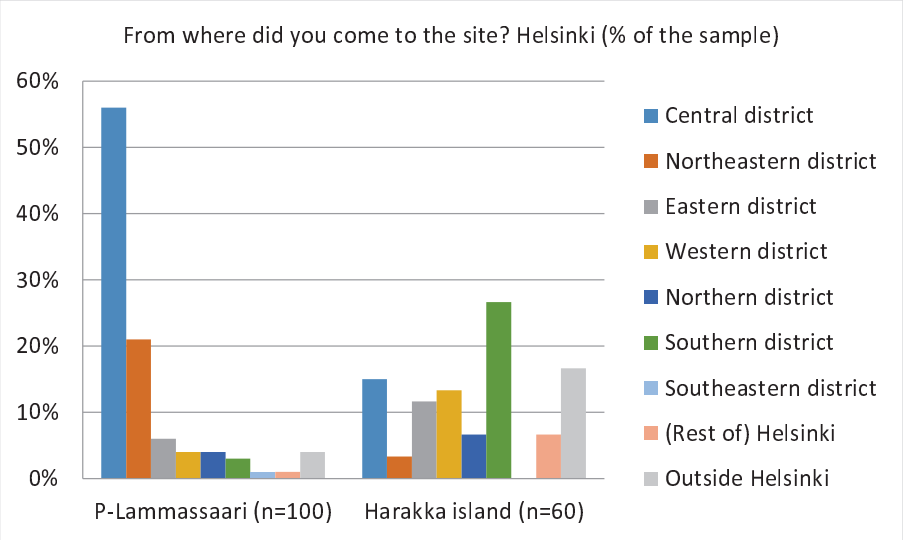



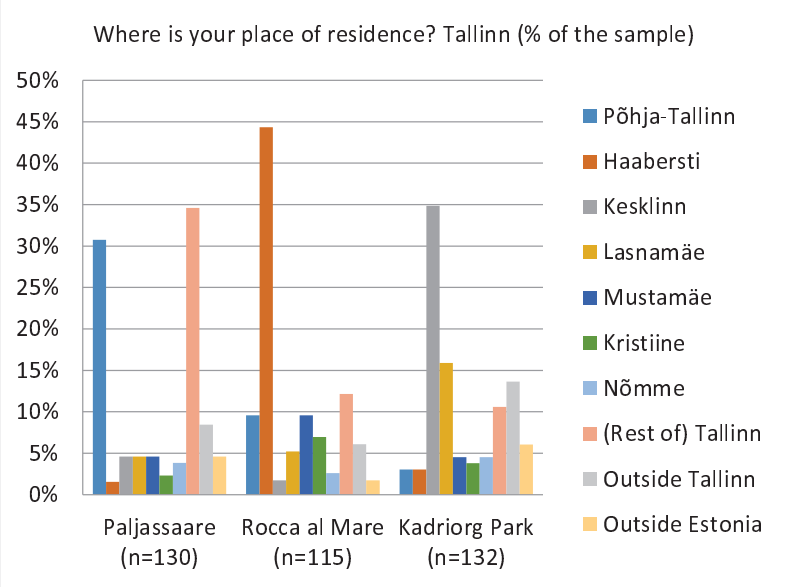

*Figure 7. Visitors' starting point to the sites*

However, it cannot be confirmed that the majority of visitors also live in the same city district from where they came to the green area, since in several questionnaires the respondents did not indicate their place of residence at the level of city district (19% in Tallinn and 39% in Helsinki), but at the city level only, or left the question unanswered (Q2).

Only in the cases of Rocca al Mare and Kadriorg, the responses were detailed enough to conclude that the majority of these green area visitors also **live in the same city district** (respectively 44% in Haabersti and 35% in City Centre) (Figure 8).

**The foreigners** who visited Paljassaare lived in Finland, Lithuania and New Zealand (in total 5% of respondents). To Rocca al Mare they came from Finland and Germany (2%); to Kadriorg, from Finland, USA, Great Britain, Lithuania, Norway, Armenia (6%); to

Pornaistenniemi-Lammassaari from Czech, Switzerland, Germany, Hungary and France (5%); to Harakka Island from the Netherlands, Turkey, China, USA and Australia (10%).



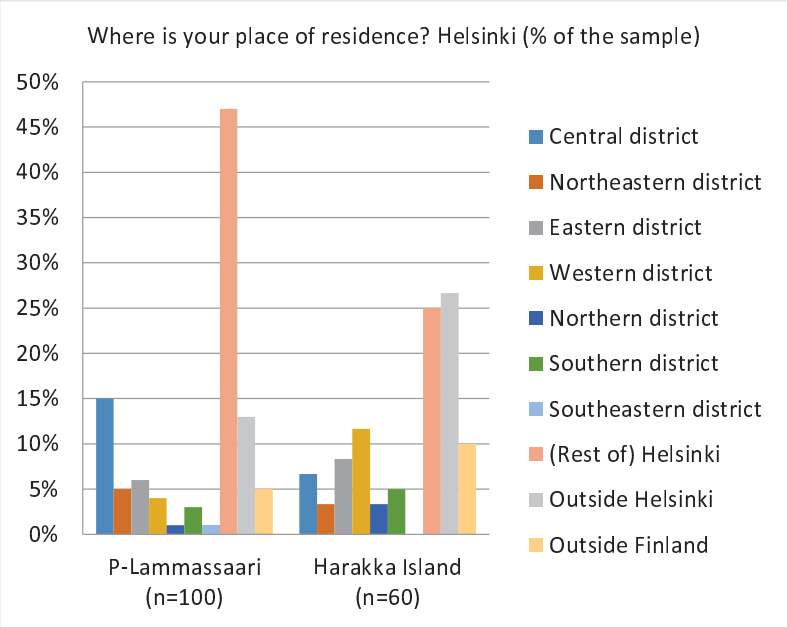




*Figure 8. Visitors' places of residence by sites*

#### 1.1.1.2. How long it took to travel to the green area

The range of travelling time extended from 0 minutes (in Rocca al Mare) to 300 minutes (Pornaistenniemi-Lammassaari). **The average travelling time** was quite similar for almost all surveyed green areas: **22 to 29 minutes**, except to Harakka Island, where it was 50 minutes. **The median travelling time** was even shorter (15–20 min), only in the case of Harakka Island it was slightly longer than the average (Figure 9).

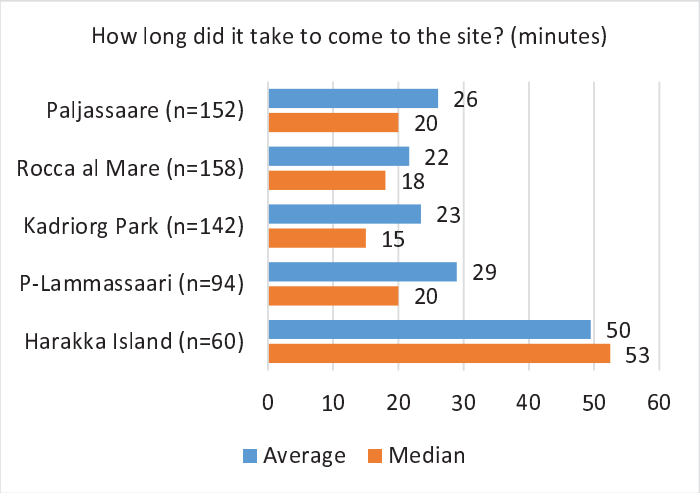
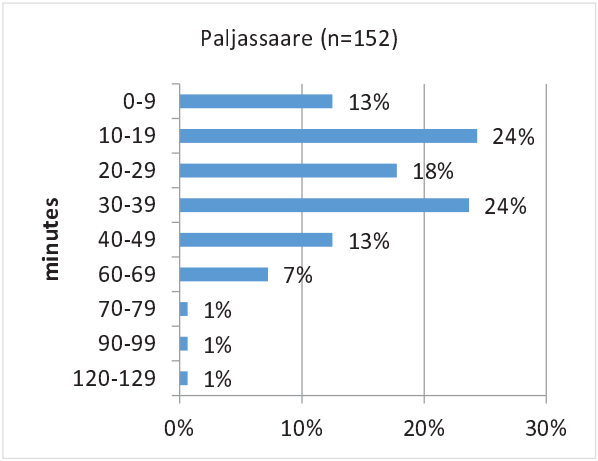
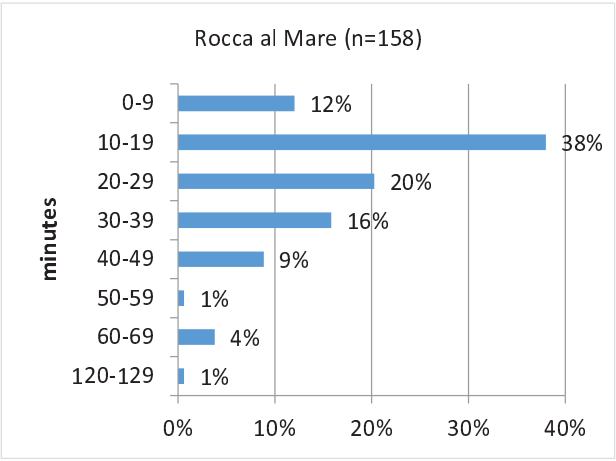


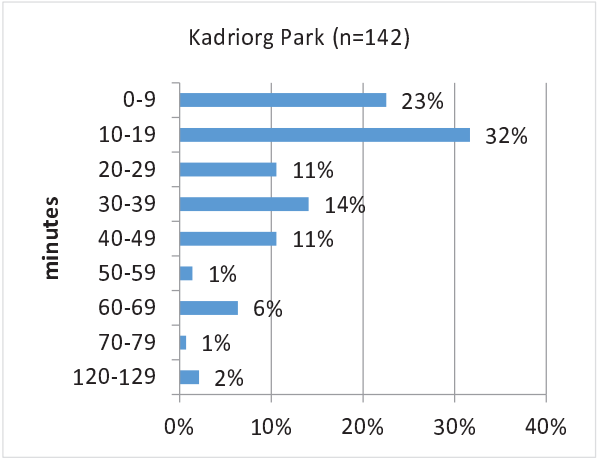

*Figure 9. Average and median time to come to the site*

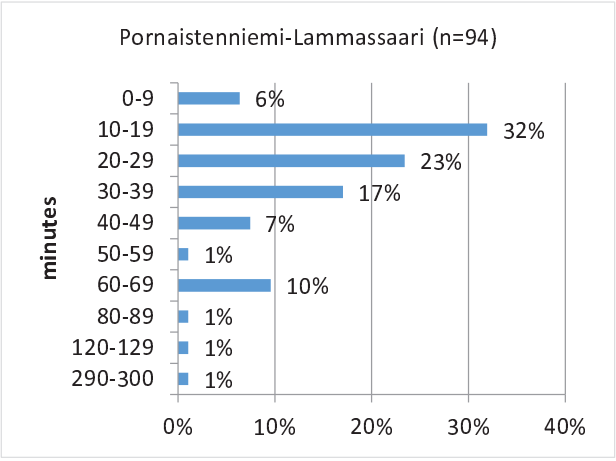
It should be noted, however, that the question about evaluating the travelling time was apparently understood in different ways. Although the starting point may have been in the same city district, **the travelling time** to the green area by the same main mode of transport **varied significantly** (e.g. from Ullanlinna to Harakka Island 5–90 minutes, from Katajanokka to Harakka 30–90 minutes). The boatride from the mainland to Harakka Island takes 5 minutes, so some visitors were likely just counting that.

In general, the travelling time for the majority of respondents remained within the limit of one hour (Figure 10).





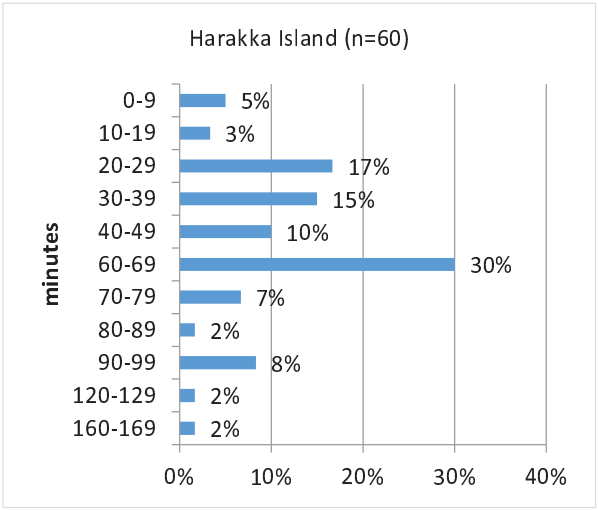




*Figure 10. Travelling time to the site*

#### 1.1.1.3. How the respondents came to the green area and access to the site

The respondents were asked to choose **the main travelling mode** from among the following options: *on foot*, *by bike*, *by motorbike*, *by public transport*, *by organised bus*, *by car*, *other* (Q3). Under the option *other*, rollerskating and by ferry were written in as responses (Figure 11).

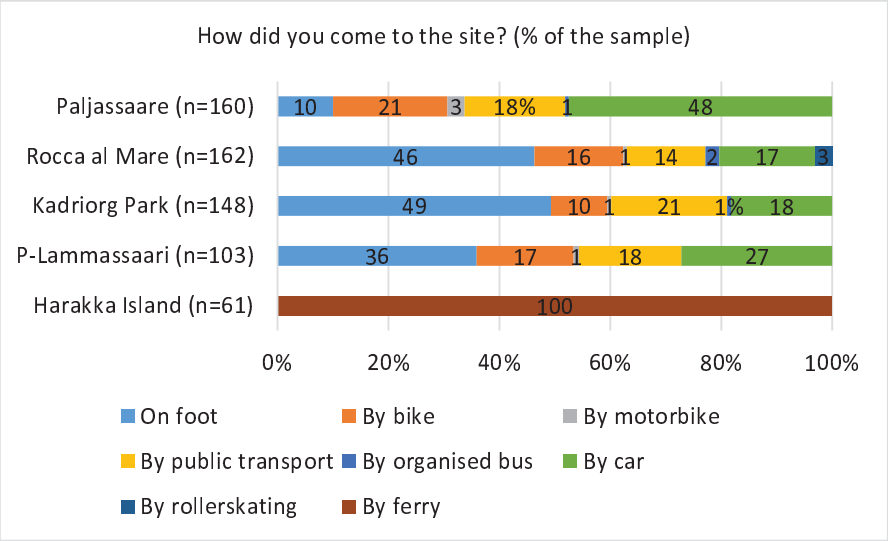



*Figure 11. Main travelling mode to go to the site*

Since most of the visitors came to the green areas from the surrounding districts, then it is not surprising that they **travelled mainly by foot or by bike**, except to Harakka Island which can only be reached by ferry and to Paljassaare where the main travelling mode was by car (48%). The latter can be explained by the location of Paljassaare (less residential houses in the neighbourhood) and lower accessibility by walking, cycling or public transport (as one respondent pointed out: *the road to Paljassaare is not good for riding a bike and the pavements are in poor condition*).

**Access to the site** was one of the items rated in Q16 (How do you evaluate the nature management of the site and access to the site?). In Paljassaare, the access issue was of concern for more visitors than in other sites, as is shown by the lower average score for accessibility (Figure 12).

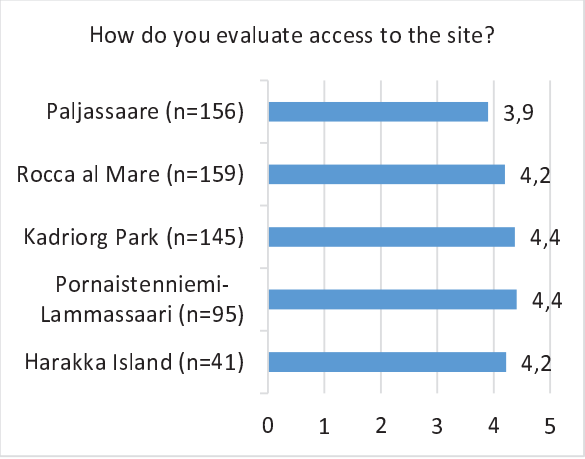



*Figure 12. Access to the sites on a scale of 1 (very poor) to 5 (very good)*

In Rocca al Mare and Pornaistenniemi-Lammassaari, there were differences in the scores for accessibility of the site between those who hadn't been using the site for very long time (answering "I am here for the first time" or "Only this year" in Q9); and those who had

been visiting the site for at least two years (the rest of answer groups of Q9). The **newcomers** gave a lower score for the accessibility of Rocca al Mare and Pornaistenniemi-Lammassaari than **visitors with longer history** (Table 3). For the other sites, the average assessments of these groups were similar.

*Table 3. Average assessment of access to the site based on the length of history in visiting the site (Q9)*

| | Access to the site | |
|---|---|---|
| | **Newcomers** | **Longer history** |
| Rocca al Mare | 3.9 | 4.3 |
| Pornaistenniemi-Lammassaari | 4.1 | 4.5 |

#### 1.1.1.4. With whom the respondents visited the green area

The multi-choice response options of the question "With whom are you visiting the site today?" were: *alone*, *with family / family member / relative(s)*, *with friend(s)*, *with colleagues*, *with an organised group*, *with someone else* (Q4). The last option was most often mentioned when the respondent was walking a dog.

However, some respondents marked options which should be exclusive to each other, e.g. alone and with friends, or alone, with family and with friends at the same time. This refers to the understanding that the question addressed visits in general, rather than only this particular visit.

Based on the responses, it can be summarised that **more respondents came with others** to the green area, rather than alone. However, in Pornaistenniemi-Lammassaari these groups are of equal size and in Rocca al Mare they are almost equal (Figure 13).

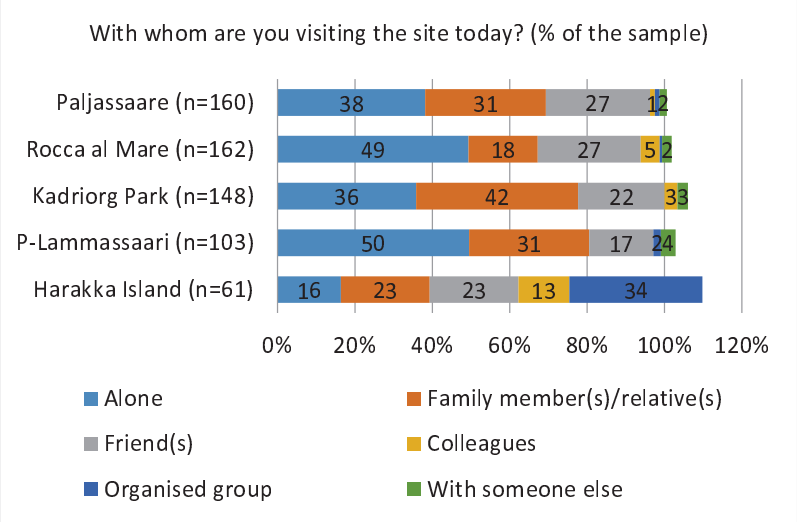



*Figure 13. Visitor group characteristics by sites*

In order to get to know the approximate number of visitors visiting together at that particular visit, respondents were also asked to mark the number of people visiting the site together if options other than *alone* were chosen,. However, in Tallinn the respondents skipped this question and in Helsinki more than half of those who visited the site together with other people left the question unanswered.

#### 1.1.1.5. How the respondents knew to come to the green area

With this question we aimed to understand whether the visitors of these green areas were **informed about the site's nature, occasional or accustomed visitors**.

The multi-choice question response options were: *I received information on the (nature of the) site from other people / … from media or books / … from Internet / … from other sources; I came here by chance; I have known the site for a long time already* (Q6). Under the option *other sources*, people mentioned school most frequently (Figure 14).

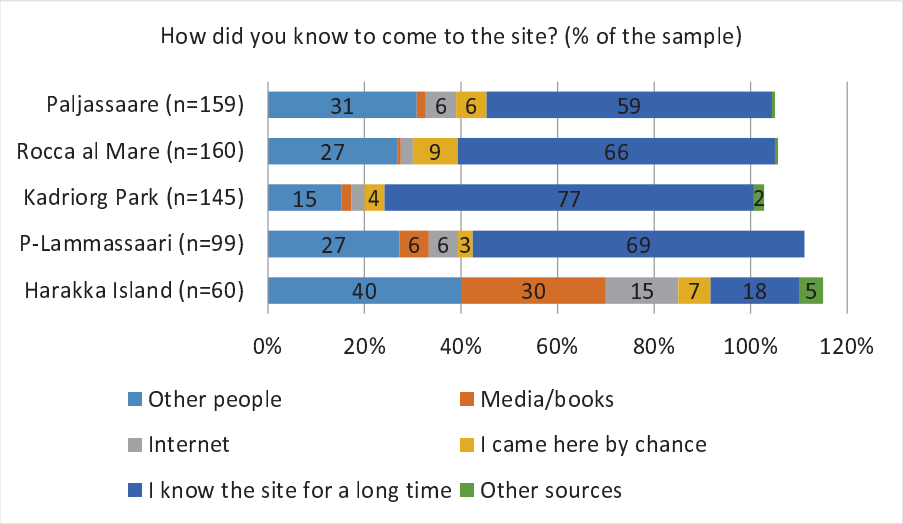



*Figure 14. Information sources for the site visit*

The majority of respondents had known the site for a long time before their visit (**accustomed visitors**), except in Harakka Island, where larger share of respondents (40%) had received information about the site from other people or from media/books (**informed visitors**). **Occasional visits** (those who came to the site by chance) were the rarest in all cases (3–9%).

However, some people belong to more than one visitor group, for example, those who stated that they came to the site by chance (occasional visitor) and at the same time they had known the site for a long time (accustomed visitor). This issue should be taken into account in preparing the methodology and questions for the next interview round in spring 2018.

### 1.1.2. Motives to visit green areas

#### 1.1.2.1. Why the respondents came to the green area on this day and previously

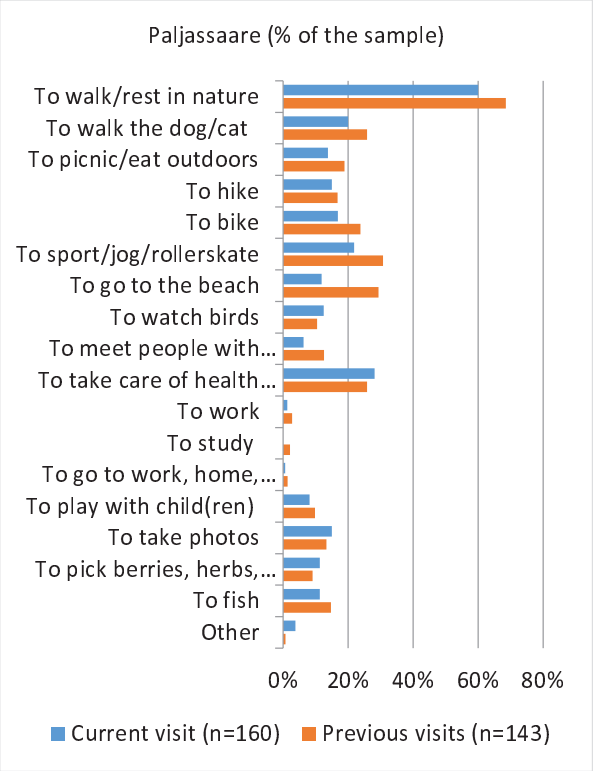
To collect data about people's motives of visiting the green areas, the respondents were given seventeen options, which in this analysis are divided into the following four categories:

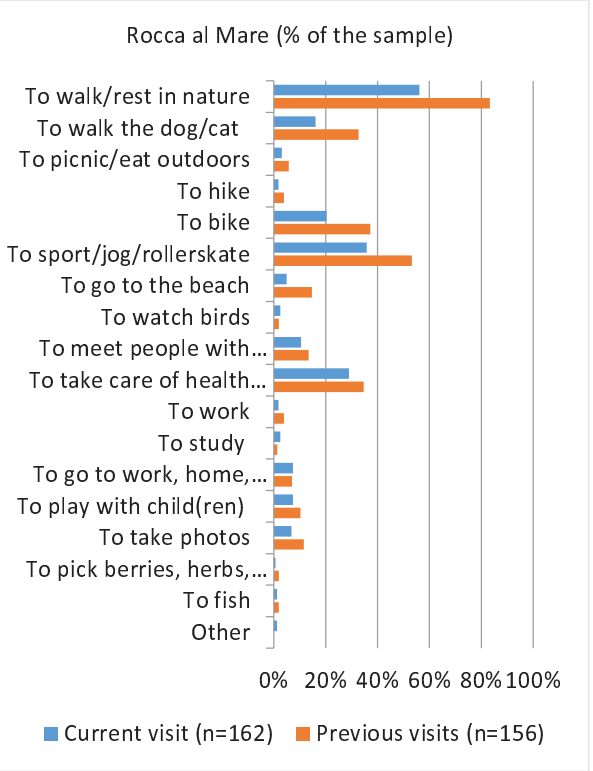
- **recreational activities:** *to picnic, to go to the beach/sunbathe, to meet other people, to play with children*;
- **mental and physical wellbeing:** *to sport, to hike, to bike, to take care of one`s health and well-being, to study*;
- **nature experience activities:** *to rest/walk in nature, to watch birds, to take photos, to pick berries/herbs/mushrooms, to fish*;
- **daily activities:** *to walk the dog/cat, to work, to go to work, home, shopping etc. in relation with day-to-day duties*.

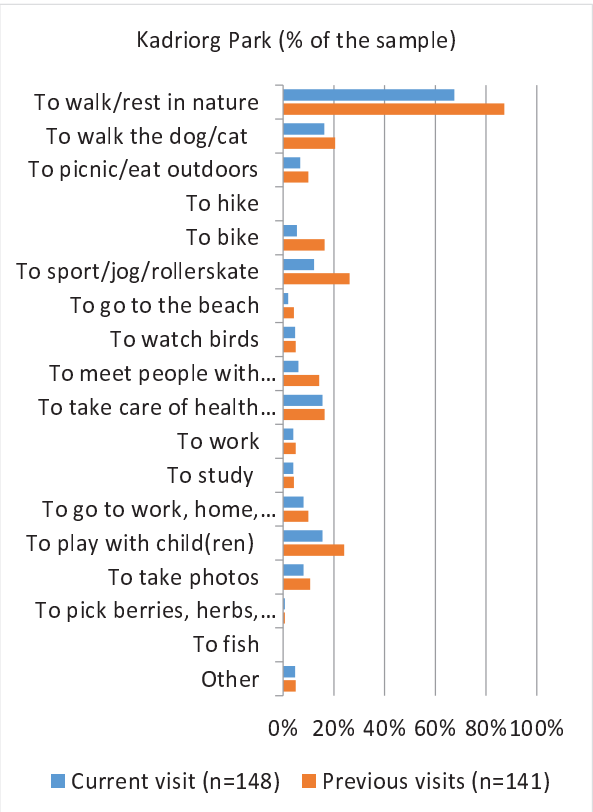
First the respondents were asked about the main reasons of their current visit (Q5) and then they were asked to choose up to three most common reasons for their previous visits (Q13).

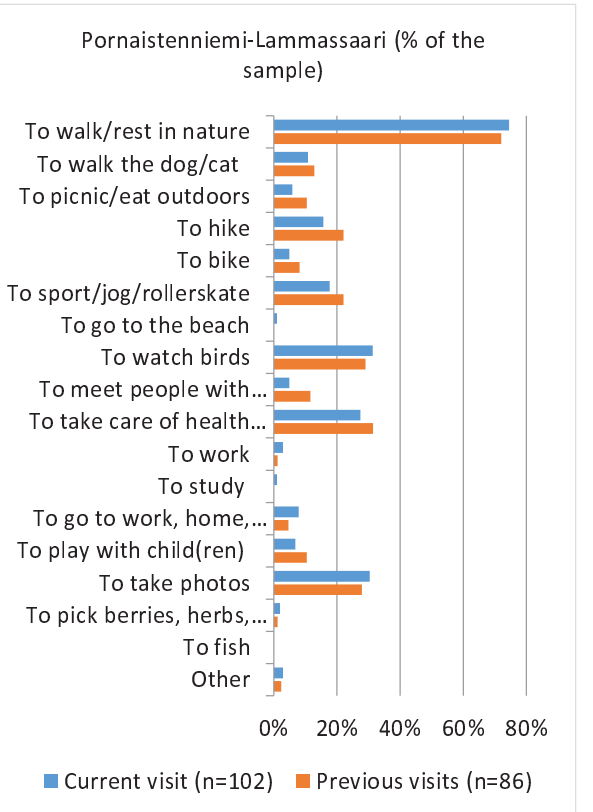
They could also add other reasons not included in the list under the option *other.* The reasons added by the respondents were: *to spend free time, to watch the sea and landscape, to play games, to find inspiration, to escape boredom, to read a book, to draw, to pick acorns and leaves, to feed squirrels, to explore the island, to visit the nature centre, to go to the guided tour*, etc.

The primary reason for visits on this day as well as previously in all green areas was **walking/resting in nature** (Figure 15).


Paljassaare (% of the sample)
To walk/rest in nature
To walk the dog/cat
To picnic/eat outdoors
To hike
To bike
To sport/jog/rollerskate
To go to the beach
To watch birds
To meet people with...
To take care of health...
To work
To study
To go to work, home,...
To play with child(ren)
To take photos
To pick berries, herbs,...
To fish
Other
0% 20% 40% 60% 80%
Current visit (n=160)
Previous visits (n=143)


Rocca al Mare (% of the sample)
To walk/rest in nature
To walk the dog/cat
To picnic/eat outdoors
To hike
To bike
To sport/jog/rollerskate
To go to the beach
To watch birds
To meet people with...
To take care of health...
To work
To study
To go to work, home,...
To play with child(ren)
To take photos
To pick berries, herbs,...
To fish
Other
0% 20% 40% 60% 80% 100%
Current visit (n=162)
Previous visits (n=156)


Kadriorg Park (% of the sample)
To walk/rest in nature
To walk the dog/cat
To picnic/eat outdoors
To hike
To bike
To sport/jog/rollerskate
To go to the beach
To watch birds
To meet people with...
To take care of health...
To work
To study
To go to work, home,...
To play with child(ren)
To take photos
To pick berries, herbs,...
To fish
Other
0% 20% 40% 60% 80% 100%
Current visit (n=148)
Previous visits (n=141)


Pornaistenniemi-Lammassaari (% of the sample)
To walk/rest in nature
To walk the dog/cat
To picnic/eat outdoors
To hike
To bike
To sport/jog/rollerskate
To go to the beach
To watch birds
To meet people with...
To take care of health...
To work
To study
To go to work, home,...
To play with child(ren)
To take photos
To pick berries, herbs,...
To fish
Other
0% 20% 40% 60% 80%
Current visit (n=102)
Previous visits (n=86)

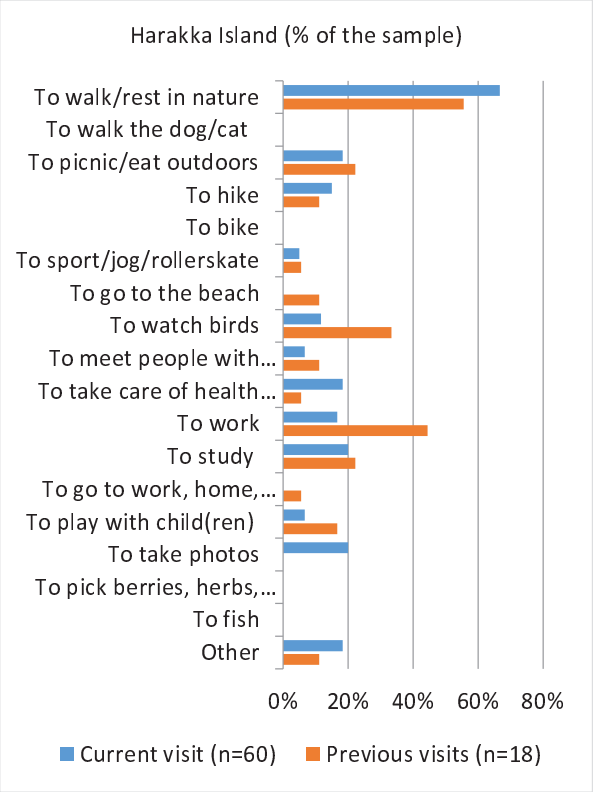
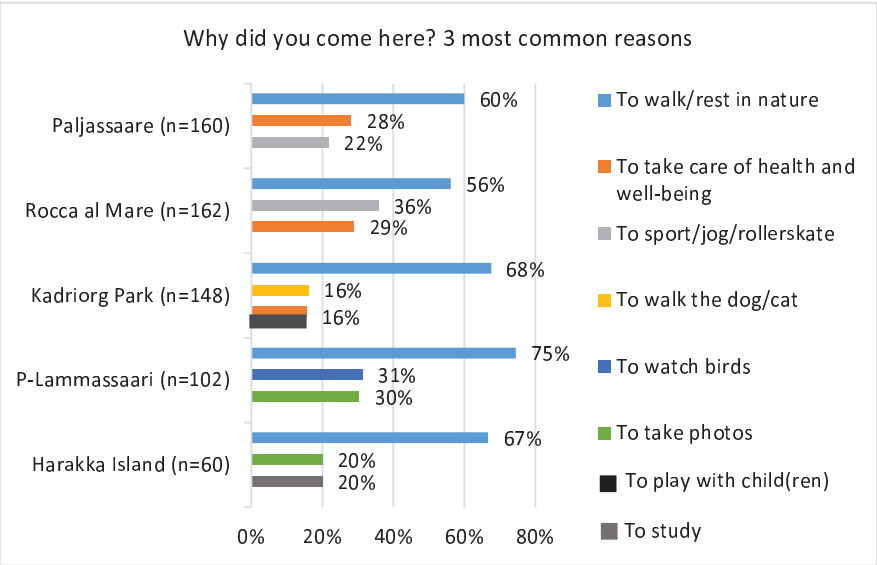



*Figure 15. Reasons for visiting the site (visit on the interview day and previous visits)*

Besides walking and resting, other common motives for the visits were taking care of one's wellbeing, sporting, watching birds, and spending time with children (Figure 16).



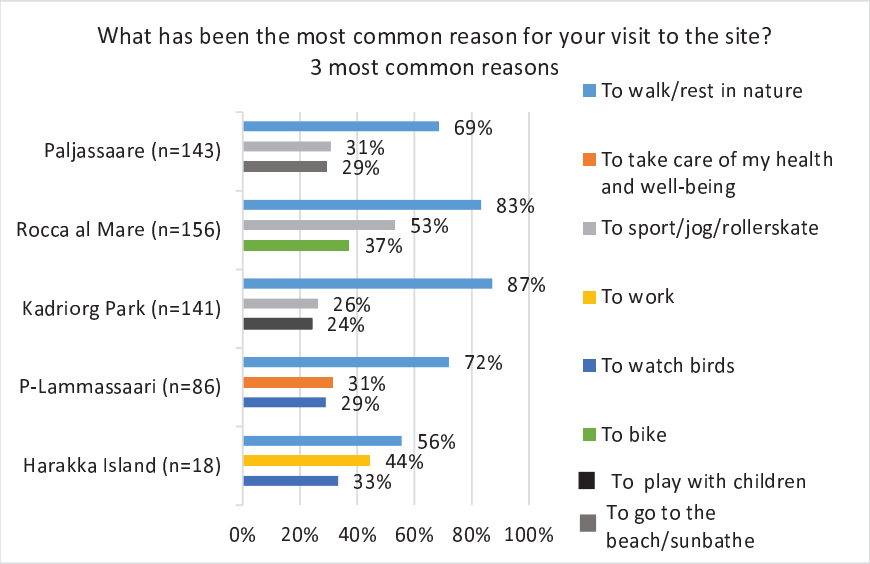



*Figure 16. Most common reasons for the current and previous visit by sites*

By grouping the listed activities into four above mentioned categories, it can be seen that the main visiting motive for the visit when the interviews were conducted, was **nature experience in four out of five sites**: this was claimed by about 50–60% of respondents of Kadriorg, Paljassaare, P-Lammassaari and Harakka (Figure 17).

For Rocca al Mare, the pattern is a little bit different, as 46% of visitors claimed reasons related to **mental and physical wellbeing** (including sporting, hiking, bicycling, etc). The mental and physical wellbeing is also high in Paljassaare (about 30%). The highest proportion of everyday activities can be noticed in the cases of Kadriorg and Pornaistenniemi-Lammassaari (close to 20%).

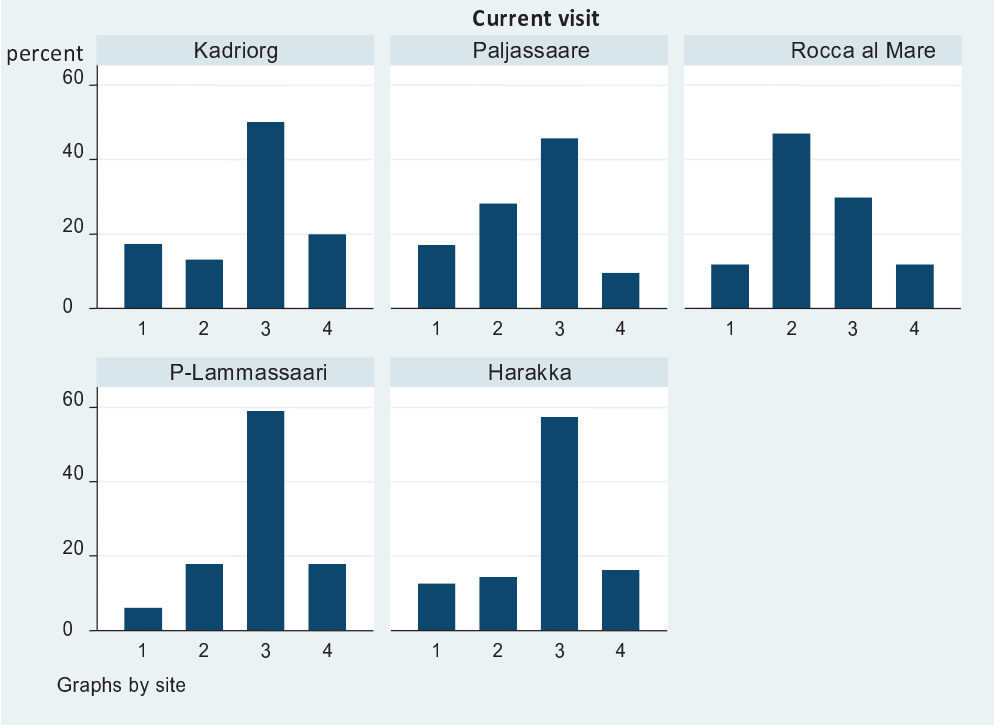



*Figure 17. Frequency plots of main motives for the current visit by sites (1 – recreational; 2 – mental and physical wellbeing; 3 – nature experience activities; 4 – everyday activities)*

It has to be noted that there were about 150 different combinations of motives (activities) provided by the respondents, including two to ten different activities listed by the same person, hence grouping involves substantial amount of subjectivity.

Some of the activities were given higher priority among others, which helped in the grouping when motives of different groups were answered by the respondent. For example, playing with children was given priority if the person named two motives: to take care of one's health and wellbeing (group 2) and to play with children (group 1). Then group 1 was assigned as the main motive, considering the wellbeing as a sub-motive and playing with children as the main motive. Similarly, working was given a priority over other motives.

If comparing the main motives of this particular visit with the **previous visits** (Figure 18), the biggest difference appears in Harakka Island – many of the visitors who came to the island in order to experience the nature were first-time visitors, and the main reason for repeat-visitors was related to work (i.e. everyday activity). Work could be education related visits by teachers or nature guides, but we do not know it exactly as this was not asked in the questionnaire.

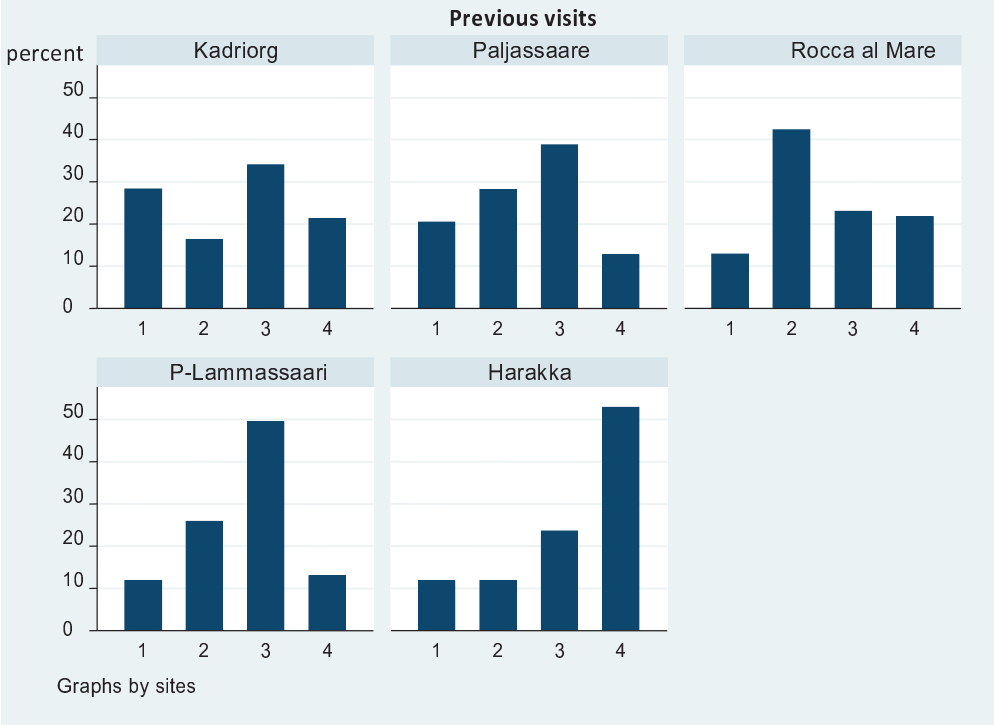



*Figure 18. Frequency plots of motives for the previous visits by sites (1 – recreational; 2 – mental and physical wellbeing; 3 – nature experience activities; 4 – everyday activities)*

#### 1.1.2.2. Differences between age groups

The motives to visit green area were also analysed according to age groups, as one of the aims of NATTOURS project is to promote urban nature tourism and environmental education among all people: elderly, young, parents with children, etc.

In **Paljassaare**, nature experience activities are most common for all age groups, except people in age 30–39 who prefer activities related with wellbeing (Figure 19).

In **Rocca al Mare**, nature experience activities are the main reason to visit the site for elderly people (over 60) and wellbeing activities were the main motivation for people aged 50–59 (Figure 20).

Likewise in **Kadriorg**, the age groups 50–59 and over 60 distinguish themselves with a very high share of visitors stating that nature experience activities were their main motive to visit the green area, although this group of activities is the most common among all age groups (Figure 21).

**Pornaistenniemi-Lammassaari** is similar to Paljassaare where nature experience is the most common motive in all age groups, except in age 30–39 (they visit the site mostly in relation to everyday activities) (Figure 22).

Also in **Harakka Island**, the pattern is similar: nature experience is the main motive to visit the site for people aged up to 29, 40–49, over 60 and equally important as wellbeing activities for people aged 50–59. The age group 30–39 prefers other activities, namely recreational and everyday activities more (Figure 23).

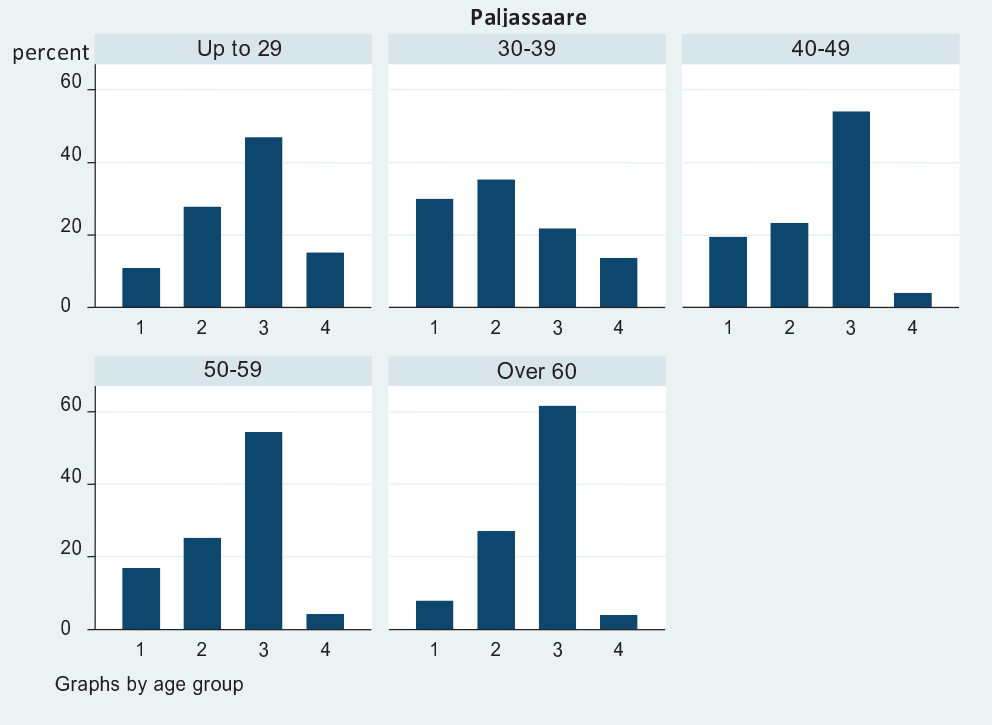



*Figure 19. Frequency plots of main motives for the current visit by age group, site: Paljassaare (1 – recreational; 2 – mental and physical wellbeing; 3 – nature experience activities; 4 – everyday activities)*

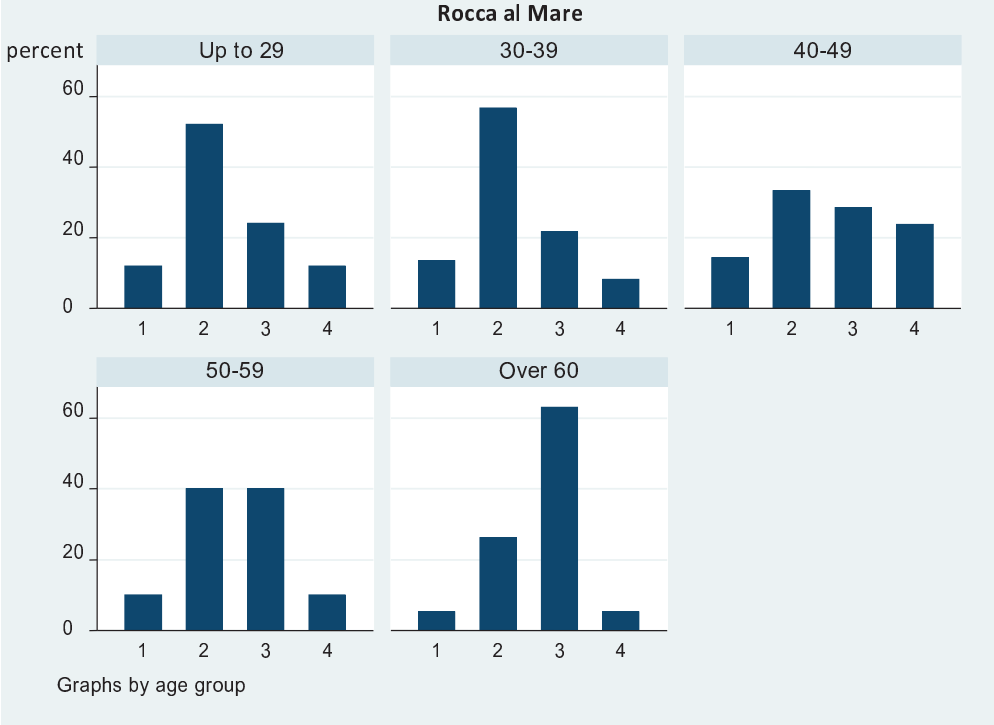



*Figure 20. Frequency plots of main motives for the current visit by age group, site: Rocca al Mare (1 – recreational; 2 – mental and physical wellbeing; 3 – nature experience activities; 4 – everyday activities)*

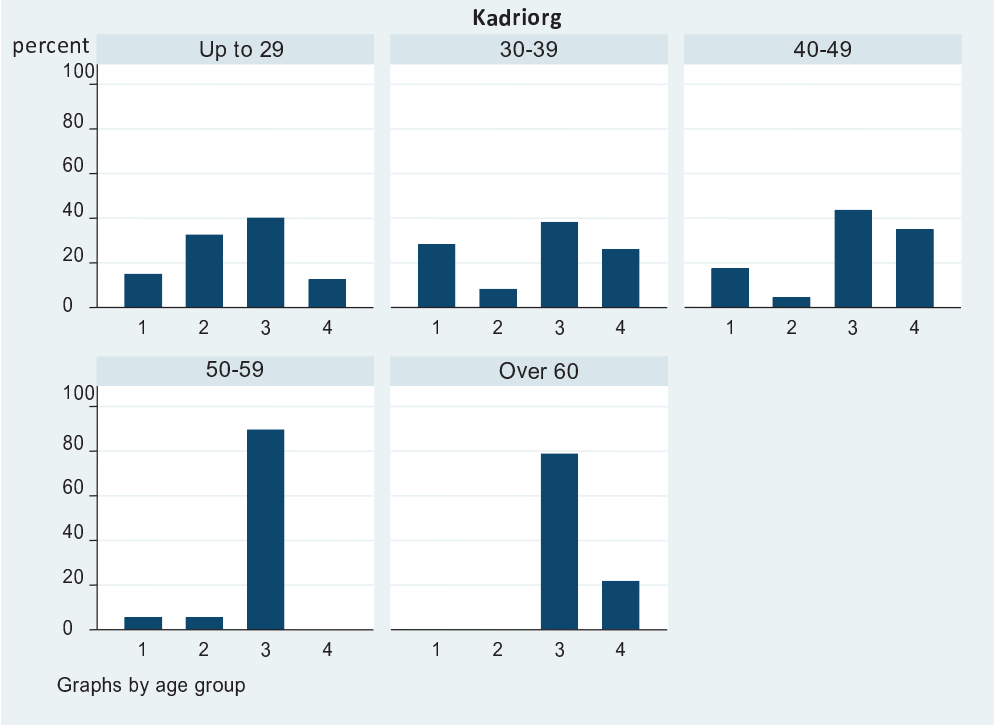



*Figure 21. Frequency plots of main motives for the current visit by age group, site: Kadriorg (1 – recreational; 2 – mental and physical wellbeing; 3 – nature experience activities; 4 – everyday activities)*

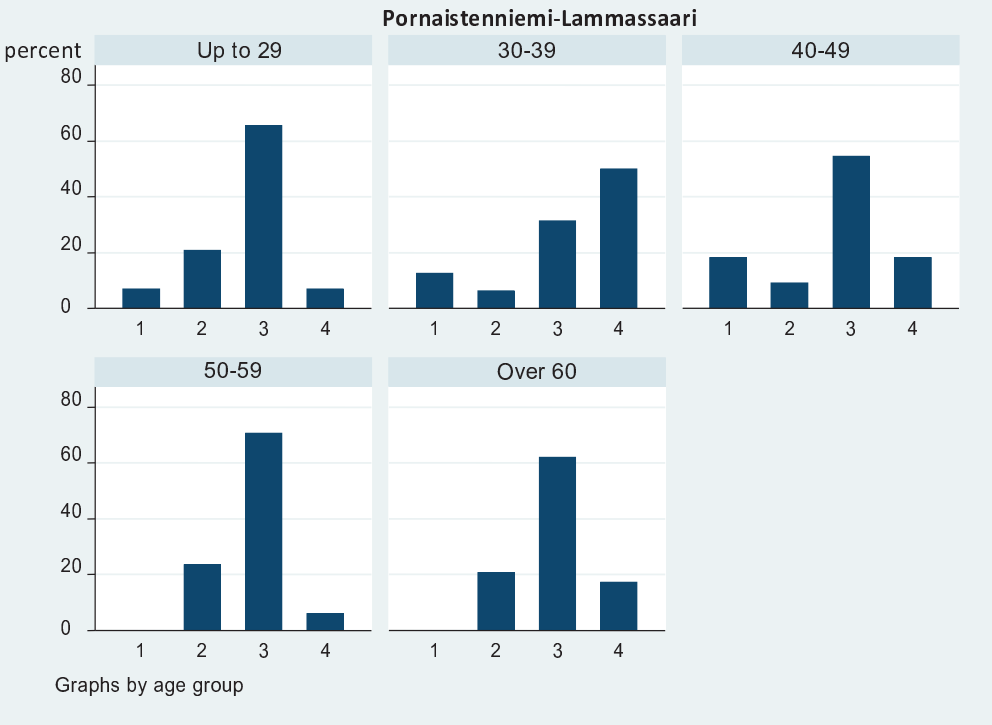



*Figure 22. Frequency plots of main motives for the current visit by age group, site: Pornaistenniemi-Lammassaari (1 – recreational; 2 – mental and physical wellbeing; 3 – nature experience activities; 4 – everyday activities)*

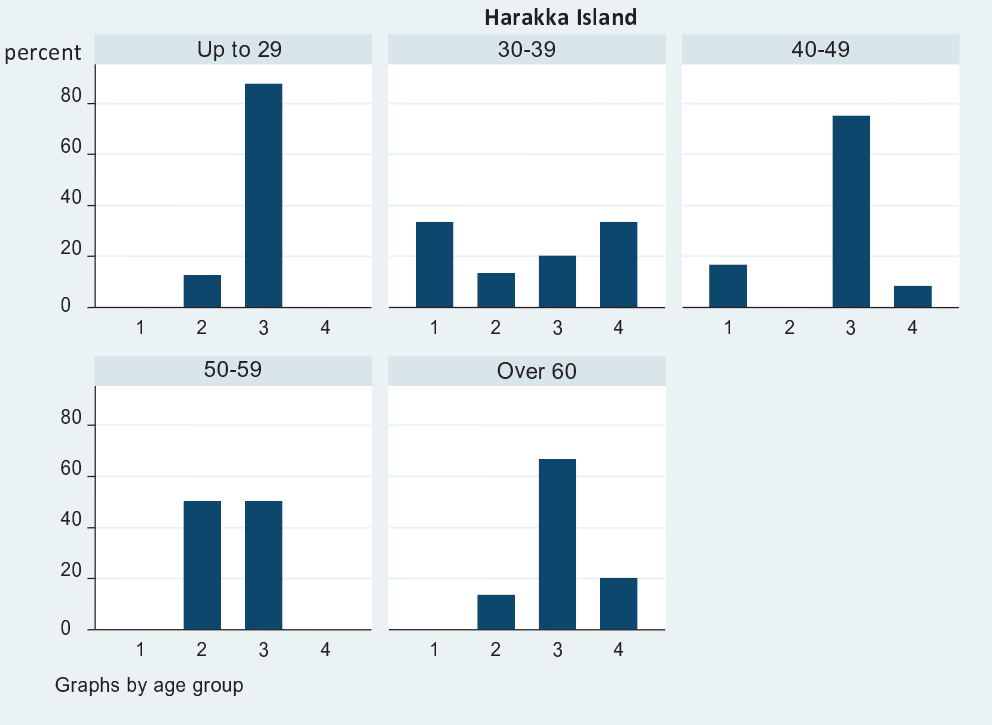



*Figure 23. Frequency plots of main motives for the current visit by age group, site: Harakka island (1 – recreational; 2 – mental and physical wellbeing; 3 – nature experience activities; 4 – everyday activities)*

### 1.1.2.3.Use of ecosystem services as motives to visit the green area

The motives to visit nature sites are linked with the **ecosystem services provided by the urban green areas**. Ecosystem services, defined as the benefits people obtain from nature, are usually divided into four main categories: provisioning, regulating, supporting and cultural services (Millennium Ecosystem Assessment 2003). The activities listed in this survey reflect the ecosystem services in the following two categories:

- **Provisioning services:**
  - **food supply** (to pick berries/herbs/mushrooms, to fish)

- **Cultural services:**
  - **nature-based recreation** (to walk/rest in nature; to walk the dog/cat; to picnic; to hike; to bike; to sport; to go to the beach/sunbathe; to meet other people; to take care of one`s health and well-being; to play with child(ren))
  - **opportunities for education and working** (to study, to work)
  - **animal sighting** (to watch birds)
  - **inspiration for creative works** (to take photos)

Daily commuting to work, home, shopping, etc. through a green area is not considered a benefit for people here, although it can be a nature-based recreation in the case that people deliberately choose green area for going to their destination. Picking berries, herbs or mushrooms and fishing can also reflect cultural ecosystem service if they are considered culturally significant activities (cultural heritage).

All surveyed green areas offer opportunities for **cultural ecosystem services**. With regard to provisioning services, berry picking, mushroom or herb gathering and fishing (**food supply** as an ecosystem service) were mentioned most frequently as a motive for previous visits in **Paljassaare** (Figure 24).

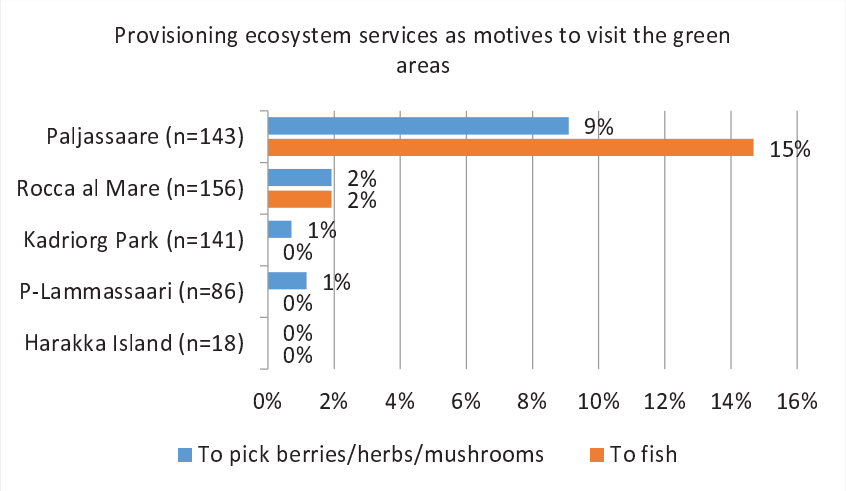



*Figure 24. Provisioning ecosystem services as motives to visit the site by respondents*

### 1.1.3. Temporal and spatial use of green areas

#### 1.1.3.1. How long the respondents planned to stay in the green area

The length of the stay was measured based on the respondents' evaluation of time spent in the area (Q7). Response was given on an ordinal scale with four levels: *<1 hour; 1–2 hours; 2–5 hours; >5 hours*.

The most common duration of a visit to the green area was **1 to 2 hours** (Figure 25). Only in Harakka Island, where there were more organised groups than in other sites, the majority of visits lasted longer as well (53% from 2 to 5 hours) and none of the respondents came there for less than an hour, e.g. for the purpose of commuting.

Visits longer than **5 hours** were mentioned very seldom in all sites. Most often it was stated in Paljassaare by those who came there mainly for fishing, birdwatching, having picnic or sunbathing, and in Harakka Island by those whose one of the main visiting reason was to study.

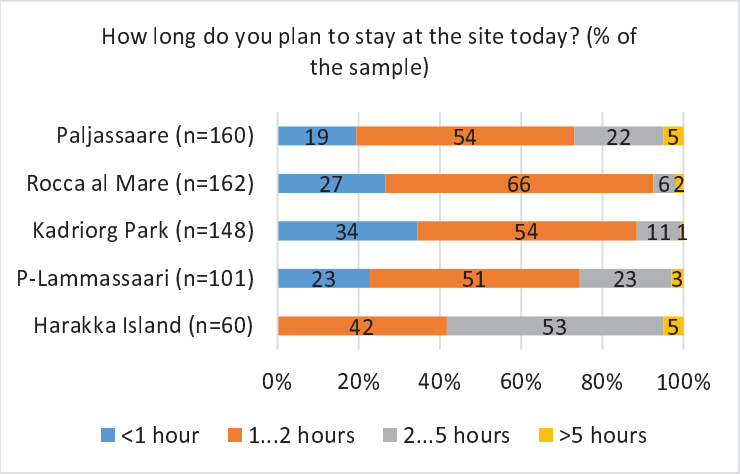



*Figure 25. Length of a visit at the site*

It was tested whether there is connection between planned length of a stay and the "length of history visiting the site" (Q9). Only in Kadriorg there is significant difference between the respondents who haven't been using the site for very long time (answering "I am here for the first time" or "Only this year" in Q9); and these, who have been visiting the site for at least two years (the rest of answer groups of Q9). The difference between the two groups implies that **these who have longer history in visiting Kadriorg, plan to stay there for longer time**. For other sites, the average length of the stay doesn't differ between the two groups.

#### 1.1.3.2. For how many years the respondents have visited this green area

**The use frequency of green areas** was evaluated on the basis of years, seasons and weekdays. First, the respondents were asked to evaluate the frequency of their visits to the green areas on ordinal scale with six grades: *I am here for the first time; only this year; 2...3 years; 4...5 years; 6...10 years; >10 years* (Q9).

The biggest difference among the sites appeared in **Harakka Island** where 67% of respondents visited the island **for the first time** (Figure 26). In other sites repeat-visitors predominated. For example, in older and larger urban green areas **Pornaistenniemi-Lammassaari and Kadriorg**, the largest part of respondents had visited them **more than 10 years** already (respectively 37% and 34%).

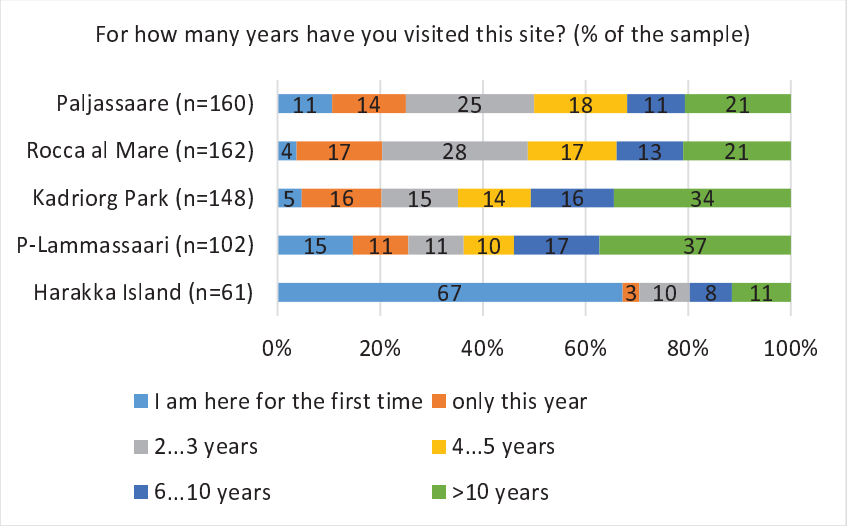



*Figure 26. Number of years when the site has been visited*

### 1.1.3.3.How often the respondents visit this green area

Those respondents, who were at this green area for the first time (Q9), did not answer to the following three questions about the frequency of their visits within a year, week and season (Q10, Q11, Q12).

The frequency of visits within a year was evaluated by the respondents on ordinal scale with five grades: *almost every day; at least once a week; at least once a month; at least once a year; more seldom* (Q10).

The respondents appear to be rather frequent users of these green areas, except in **Harakka Island** where half of the respondents (50%) who had been on the island before, stated that they visit the island **more seldom** than once a year (Figure 27). In Kadriorg, which is located almost in the centre of Tallinn, the largest share of respondents visits the site **almost every day** (31%).

At the same time, compared to other sites in Tallinn, there were also more infrequent visitors in Kadriorg due to the higher share of visitors from outside Tallinn (10% visited the park less than once a year).

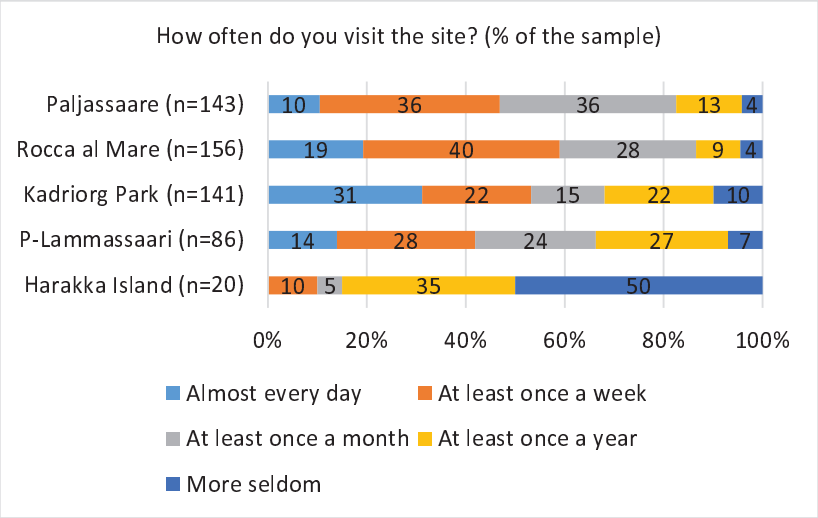



*Figure 27. Frequency of visits in a year*

### 1.1.3.4. When the respondents usually visit this green area

To evaluate how the amount of visitors is distributed in a week, a multi-choice question was asked whether the respondents usually visit the green area *on working days*, *on weekend or on holiday* (Q11).

Interestingly, the most frequently mentioned time for visits in Tallinn was weekend, while in Helsinki working days were mentioned more than weekends (Figure 28).

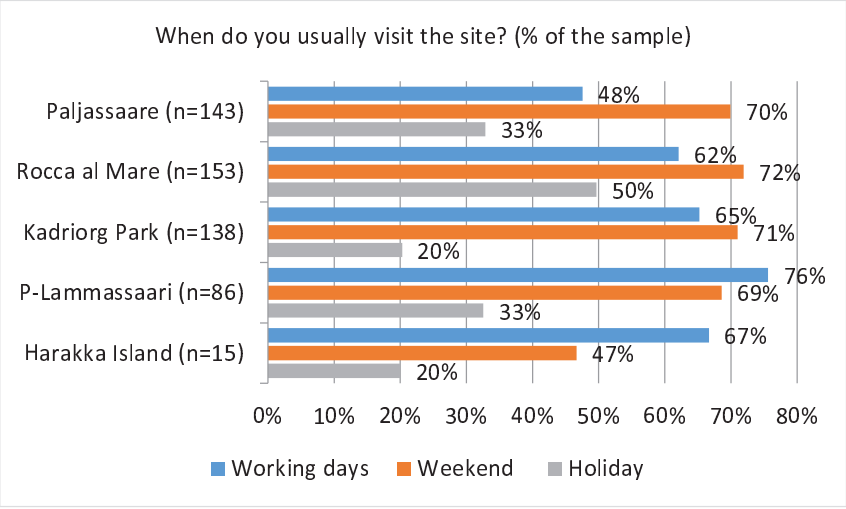



*Figure 28. Most common time of the visit in a week*

### 1.1.3.5. In which season the respondents mostly visit this green area

The multi-choice response options for the question about the seasonal pattern of visiting the green areas were: *all the year round; in spring; in summer; in autumn; in winter* (Q12).

Rocca al Mare, Kadriorg and Pornaistenniemi-Lammassaari seem to be **visiting destinations throughout a year** (Figure 29). In Paljassaare, there were slightly more those respondents who preferred summer months (49%). In Harakka Island, the most often stated response was autumn (47%). Specifically winter as a visiting season was mentioned the least by the respondents (1% in all three green areas of Tallinn).

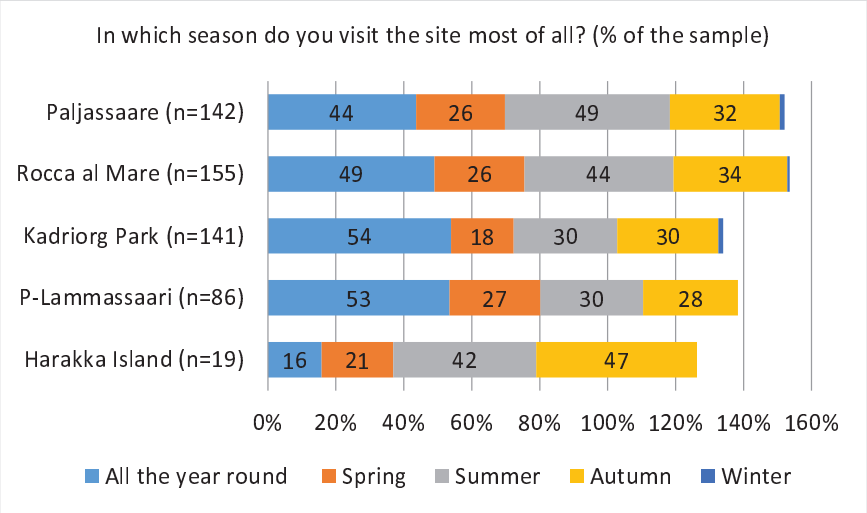



*Figure 29. Seasonal pattern of visits by sites*

### 1.1.3.6. The factors affecting the frequency of visits to the green area

To find out, which factors affect the frequency of visiting these nature sites, an ordered probit was constructed. Dependent variable was Q10: How often do you visit the site? (It was reordered for the model, so that 1 – more seldom; 2 – at least once a year; 3 – at least once a month; 4 – at least once a week; 5 – almost every day).

Independent variables were: Q1 (how long did it take), Q3 (travelling mode), Q4 (with whom), Q5 (general groups of main motives), Q7 (how long do you plan to stay), Q11 (when do you usually visit), Q13 (motives of previous visits), Q20 (age), Q21 (nationality), Q22 (gender).

In Table 4, only the significant results have been brought out. As this is a probit model, the coefficients itself are not meaningful to interpret in Table 4, only the signs, which show the direction of relation.

For example, the negative sign in the case of time (Q1) shows that the people who come from longer distances (taking more time), visit less frequently compared to those who come from closer areas (taking less time).

If there are multiple categories for one variable, the first category is the comparison category: for example, in Q3 (travel mode), the negative coefficients for bicycle, public

transport and car demonstrate that if visitor is using these modes, they are coming more seldom to the site compared to these who come on foot.

The positive coefficients, on the contrary, show the positive relation between variables. For example, in the case of age the positive coefficient demonstrates that older people come more often to the site compared to young people.

*Table 4. Results of ordered probit model*

| | Paljassaare | Rocca al Mare | Kadriorg | P-Lammassaari | Harakka |
|---|---|---|---|---|---|
| **Q1 (time)** | -0,02** | -0,02* | -0,02*** | | |
| **Q3 (travel mode)** | | | | | |
| *Bicycle* | | | *-0,71*** | *-0,65** | |
| *Public transport* | | | *-0,94**** | *-0,74** | |
| *Car* | | | *-0,93**** | *-1,24**** | |
| **Q4 (with whom)** | | | | | |
| *Family* | *-0,93**** | | | *-0,61** | *-2,40** |
| *Friend(s)* | *-0,82**** | *-0,62*** | | *-0,86** | *-2,08** |
| *Co-worker(s)* | | | | | *-3,06** |
| *Organised group* | *-1,41** | | | | *-3,40*** |
| **Q5 (motive)** | | | | | |
| *Mental and physical wellbeing* | | | | | |
| *Nature experience* | | | | | *-2,78** |
| *Everyday activities* | | *1,04**** | | | |
| **Q7 (length of visit)** | | | | | |
| *1–2 hours* | | | | *-1,71*** | |
| *2–5 hours* | | | *-0,77*** | *-0,78** | |
| *More than 5 hours* | | | | *1,78*** | |
| **Q20 (age)** | *0,02**** | *0,01** | | *0,03**** | |
| **Q21 (nationality)** | *1,77** | | *-1,06*** | *0,02*** | |

*** - sig<0.01; ** - sig<0.05; * - sig<0.1

### 1.1.3.7.Most frequent users of green areas

To see the differences across groups, Table 5 provides marginal effects for these who visit sites almost daily. Based on that, we can characterize the people **who are more likely to visit these sites frequently**.

In **Paljassaare**, the everyday visitors are more likely alone and their motives are related to recreational and everyday activities, but it is not related to travelling mode, length of the visit, gender, etc. The average age of the sample was 41,7, but the one of everyday visitors of this site even higher: 56,8 years.

In **Rocca al Mare**, it is more likely that everyday visitors come on foot or by public transport, alone or with family members. Their motives are more likely related to everyday activities and they are more likely female (although the difference is small, but in other sites they are more likely male). The average age of these who visit the site daily is 35,7 years.

In **Kadriorg**, typical visitors come on foot, plan to be at the site for less than an hour, are more likely to visit on working days and motives for visiting are related to everyday activities like going to work, walking the dog, etc. The average age of Kadriorg visitors was 38 and of these who visit this site almost daily, the average age is 41 years. They are also more likely to be men.

Also in **Pornaistenniemi-Lammassaari**, everyday visitors most likely come on foot, and usually for less than one hour. The motives are related to everyday activities and nature experience. The average age of the sample was 44,7 years, and the one of everyday visitors of this site was 53,8 years.

None of the respondents visited Harakka Island almost every day.

*Table 5. Marginal effects of ordered probit model (outcome=5, i.e. how often do you visit: almost every day)*

| | Paljassaare | Rocca al Mare | Kadriorg | P-Lammassaari |
|---|---|---|---|---|
| **Q3 (travel mode)** | | | | |
| *By foot* | *0.10*** | *0.23**** | *0.36**** | *0.17**** |
| *By bike* | *0.06*** | *0.17**** | *0.26**** | *0.12**** |
| *By motorbike* | | | | |
| *By public transport* | *0.13**** | *0.25**** | *0.21**** | *0.08*** |
| *By organised bus* | | | | |
| *By car* | *0.10**** | *0.14**** | *0.18**** | *0.08**** |
| **Q4 (with whom)** | | | | |
| *Alone* | *0.14**** | *0.24**** | *0.33**** | *0.12**** |
| *With family* | *0.04*** | *0.21**** | *0.30**** | *0.08**** |
| *With friends* | *0.04*** | *0.12**** | *0.27**** | |

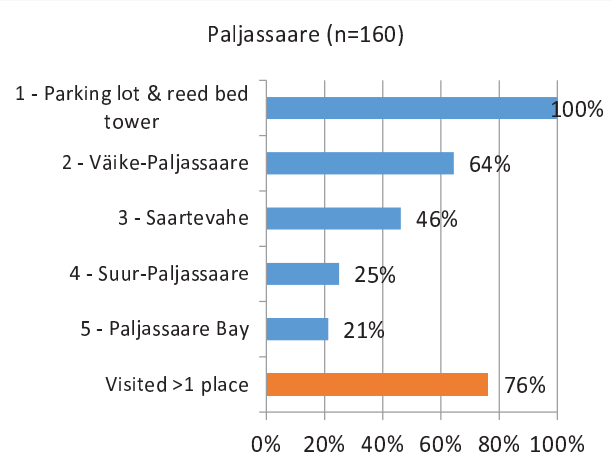
| | | | | |
|---|---|---|---|---|
| *With co-workers* | | | | |
| **Q5 (motives)** | | | | |
| *Recreational* | *0.15*** | | *0.33*** | |
| *Wellbeing* | *0.10*** | *0.22*** | *0.26*** | *0.07*** |
| *Nature experience* | *0.06*** | *0.13*** | *0.27*** | *0.14*** |
| *Everyday activities* | *0.17*** | *0.48*** | *0.41*** | *0.15*** |
| **Q7 (how long)** | | | | |
| *Less than one hour* | *0.09*** | *0.18*** | *0.36*** | *0.20*** |
| *1–2 hours* | *0.09*** | *0.22*** | *0.28*** | *0.06*** |
| *2–5 hours* | *0.10*** | | *0.30*** | |
| **Q11 (when)** | | | | |
| *Working days and weekends* | *0.16*** | *0.31*** | *0.31*** | *0.19*** |
| *Working days* | *0.15*** | *0.20*** | *0.46*** | *0.07*** |
| *Weekends* | *0.03*** | *0.08*** | *0.12*** | |
| *Holiday* | | | | |
| **Q21 (nationality)** | | | | |
| *Estonian* | *0.09*** | *0.20*** | *0.32*** | |
| *Russian* | *0.10*** | *0.17*** | *0.36*** | |
| *Other* | | | | |
| *Finnish* | | | | *0.13*** |
| **Q22 (gender)** | | | | |
| *Male* | *0.10*** | *0.19*** | *0.36*** | *0.16*** |
| *Female* | *0.08*** | *0.21*** | *0.29*** | *0.10*** |

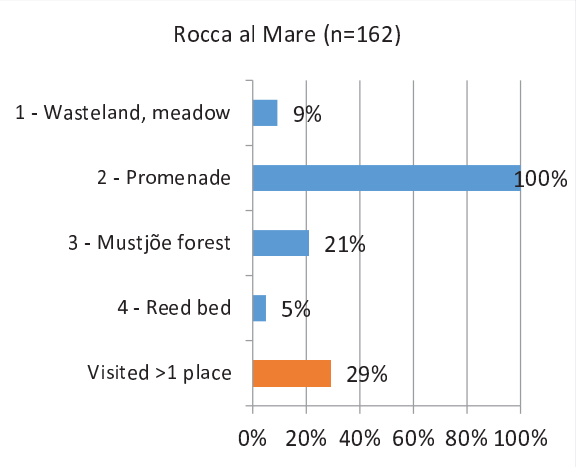
#### 1.1.3.8. Which places the respondents planned to visit / visited in the green area

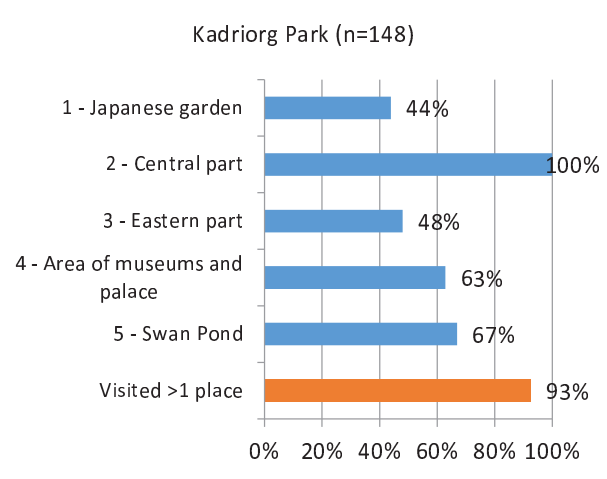
The sites were divided into smaller parts and marked on the map. The respondents were asked to mark the places which they planned to visit/had visited on this day (Q8). The aim was to get to know how the visitors of green areas were spatially distributed.

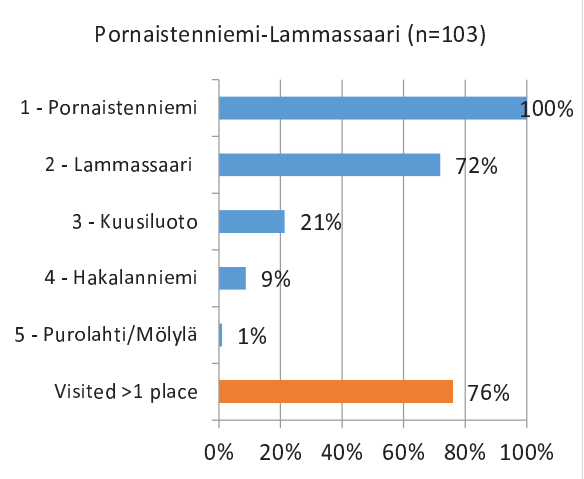
Paljassaare, Kadriorg Park and Pornaistenniemi-Lammassaari were divided into five parts, Rocca al Mare into four and Harakka Island into two parts.

In Harakka Island, which is the smallest out of the five green areas, 82% of the respondents visited the whole island during one stay. On the contrary, in Rocca al Mare there is a single most visited site – the promenade. Relatively few respondents (29%) also went to other parts of the green area. In rest of the green areas, the majority of respondents visited more than one part of the area. The locations of interviews are shown as 100% of visits on Figure 30.



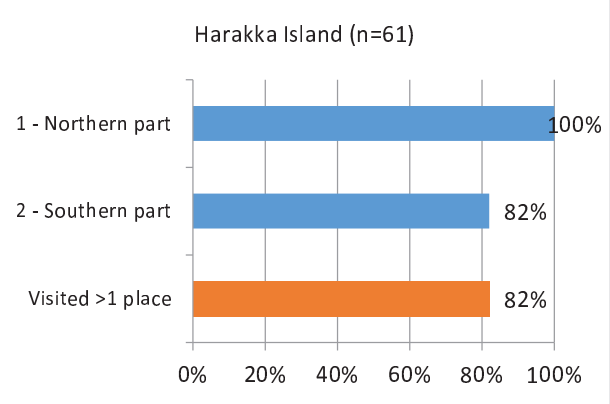



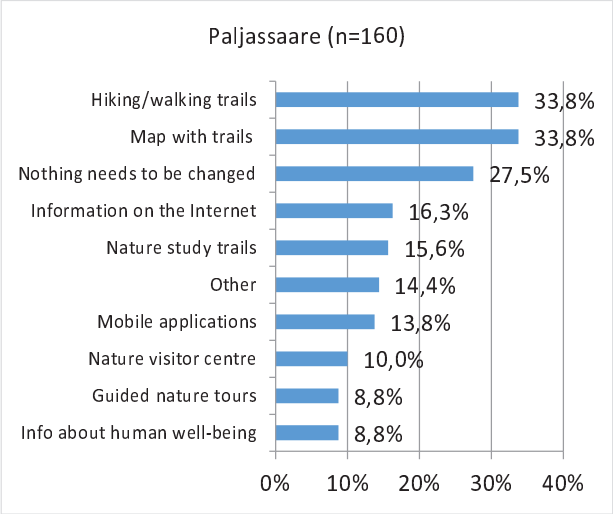
*Figure 30. Places of visit at the sites*

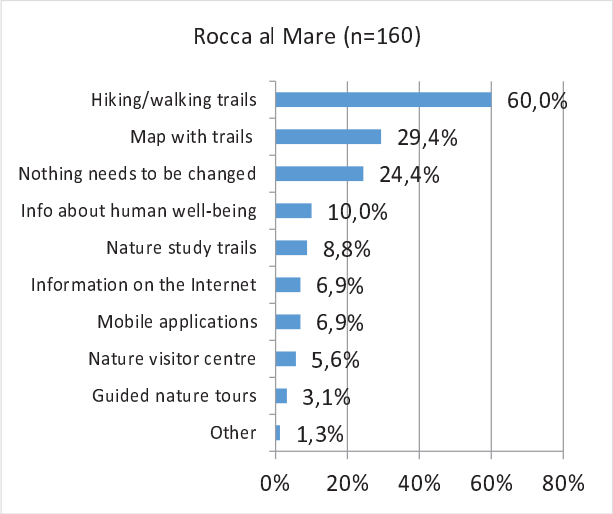
### 1.1.4. Site's nature: preferences, satisfaction and expectations

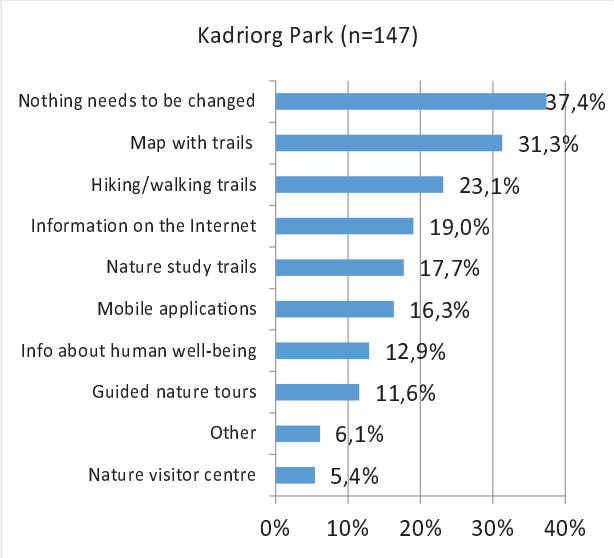
#### 1.1.4.1. What kind of nature education/information services are needed at the site

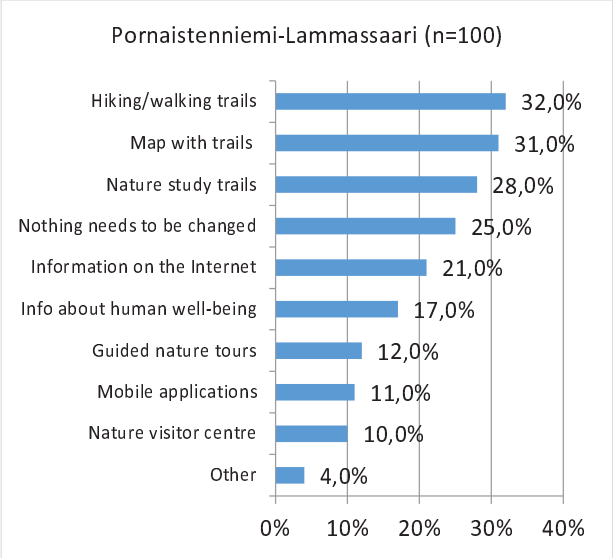
The multi-choice response options given were: *designated hiking/walking trails; nature study trail with detailed information on landscape and wildlife; information about nature's effects on human well-being; map with trails; guided nature tours; nature visitor centre; information on the Internet about the site and its nature; web applications on the site's nature; nothing needs to be changed; other* (Q14).

The respondents would prefer more designated hiking/walking or nature trails which were the most frequently mentioned response in Paljassaare, Rocca al Mare, Pornaistenniemi-Lammassaari and Harakka Island (Figure 31). In Kadriorg, there were more those respondents who were satisfied with the current situation and did not miss anything.





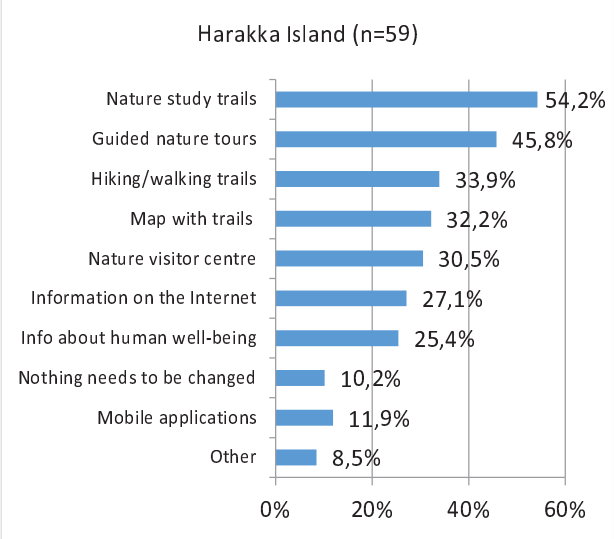




*Figure 31. Need for nature education/information services at the site*

Among those who responded that **nothing needs to be changed at the site**, respondents with **longer site visiting history prevailed**, except in Harakka Island.

In Paljassaare, 33 respondents who were of such opinion, had visited the site for at least two years, while 11 were at the site for the first time or had visited only during one year (according to the response options in Q4). In Rocca al Mare, the respective numbers are 30 and 9, in Kadriorg 47 and 8, in Pornaistenniemi-Lammassaari 22 and 3 and in Harakka Island, 2 and 4.

Under the option *other*, the respondents pointed out a wide range of wishes, not only nature information/education issues:

- **maps** with information about: 1) distances, 2) location of the map viewer ("You are here"), 3) camping (Paljassaare), park plan and information about the site at the Kadriorg Palace
- **signs**: road signs with information about the road destinations (Paljassaare), bicycling prohibition (Pornaistenniemi-Lammassaari), more signs in Swedish and better signage in bird and nature protection areas to avoid disturbance (Harakka)
- **labels and information**: at the distinguished/rare tree species (Paljassaare, Kadriorg), age of trees (Kadriorg), Latin names of plants (Pornaistenniemi-Lammassaari)
- **information boards**: about historical buildings at the site (Paljassaare) / nature (Harakka)
- **map and nature trips** for tourists (Kadriorg)
- **active recreation opportunities:** outdoor playground and fitness equipment for different age groups on the beach/recreation area (Paljassaare, Harakka), skiing tracks in winter (Rocca al Mare), bicycle paths (Kadriorg)
- **boardwalks** in reedbed and wetland (Paljassaare)
- **café/shop/selling of drinks** (Paljassaare, Harakka)
- **more sitting places** (Paljassaare, Kadriorg)
- **litter bins** (Paljassaare)
- **better regulations** related to dog walking/dog park (Paljassaare, Kadriorg, Pornaistenniemi-Lammassaari)
- **better roads** (Paljassaare, Rocca al Mare)
- **another "bird hide"** for watching wildlife (Pornaistenniemi-Lammassaari)
- **more bird identification guides**, including for smaller birds (Harakka)
- **mobile application** about the state of nature at different places (Pornaistenniemi-Lammassaari)
- **closing down the aquarium** (Harakka)

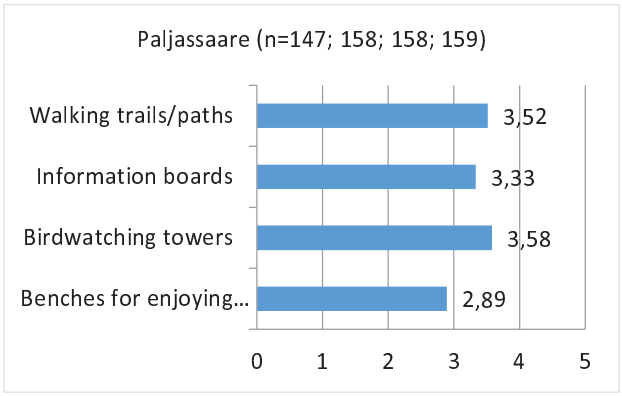
In further research it would also be useful to explore the need for nature information according to the origin of visitors, whether there is a difference between the needs of local citizens and tourists. Our sample was, however, too small to make conclusions based on this division.

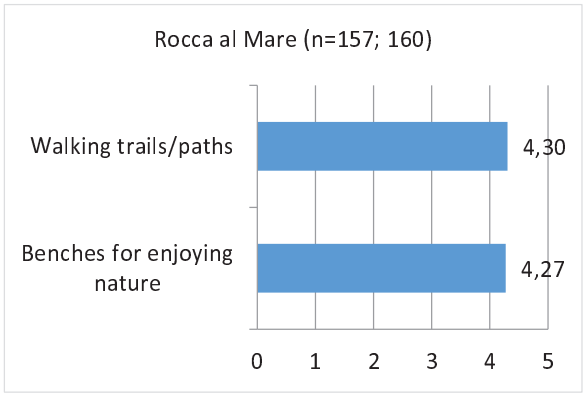
#### 1.1.4.2.How the quality of nature infrastructure at the site was evaluated

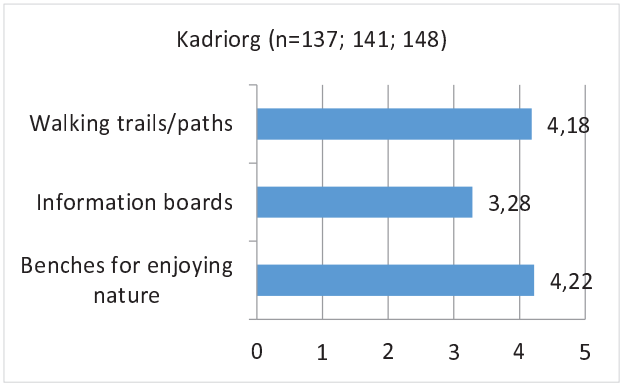
Infrastructure items in this question included *walking trails/paths, information boards, birdwatching towers* (if these existed at the site) and *benches for enjoying nature* (Q15). The respondents rated their quality along a 1–5 point measurement scale (from "very poor" to "very good").

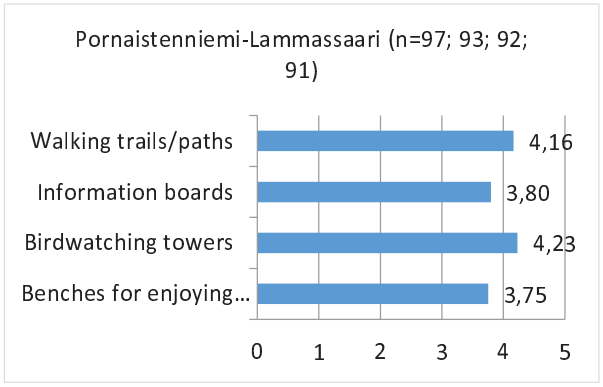
The average assessment of **walking trails** has the lowest value for Paljassaare (3,56) and the highest for Rocca (4,24). The quality of **information boards** has been assessed slightly lower in all the sites, and has the highest values in Helsinki sites (around 3,8) and the lowest for Rocca al Mare (3,04) (Figure 32).

The same pattern holds in the case of **birdwatching towers/places**, where average values in Helsinki sites are the highest (around 4,2) and the one of Paljassaare has considerably lower score (3,6). As for **benches**, the highest averages are in Rocca al Mare, Harakka and Kadriorg (over 4,15), followed by Pornaistenniemi-Lammassaari (3,8) and Paljassaare (2,9). It has to be noted that in Paljassaare benches are currently only on the beach and in a birdwatching tower (White Tower).



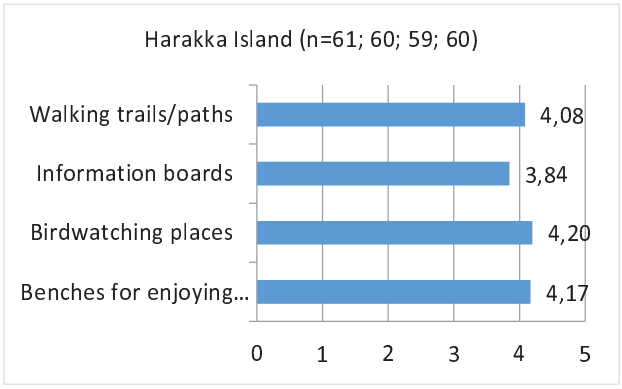




*Figure 32. Quality assessment of nature infrastructure at the site*

### 1.1.4.3. Differences between respondent groups: visiting history and nationality

Based on Q9 (For how many years have you visited the site?) the respondents were divided into two broad groups: in the first group were these who haven't been using the site for very long time (answering "I am here for the first time" or "Only this year"); and the second group consists of these, who have been visiting the site for at least two years (the rest of answer groups of Q9).

The average assessment of quality of nature infrastructure is different for these who are for the first time or just recently started to visit the site, as compared to these who have a longer history in visiting the site. This holds in the cases of **Paljassaare and Rocca al Mare**, where the **"newcomers" assess the quality of walking trails as being higher** than the ones who have been visiting the site for several years. In the case of **information boards**, the results are the opposite in Paljassaare: **newcomers assess the quality as being lower** (Table 6).

*Table 6. Average assessment of quality of nature infrastructure (Q15) on sites based on the length of history in visiting the site (Q9)*

| | Walking trails | | Information boards | |
|---|---|---|---|---|
| | Newcomers | Longer history | Newcomers | Longer history |
| Paljassaare | 3,87 | 3,39 | 3 | 3,44 |
| Rocca al Mare | 4,53 | 4,24 | | |

There is no difference according to gender or age group in the attitude towards nature infrastructure, but some differences occur based on nationality (Table 7). However, the group of "other" nationalities is very small in most cases (see nationalities of the sample in chapter 1.3.1). In the case of **information boards** in Paljassaare and Kadriorg, Estonian and Russian people are more satisfied and others are less satisfied. In Rocca al Mare and Finnish sites, there is no difference according to nationality.

In regards to **benches**, the only meaningful differences according to nationality hold for Paljassaare: Estonians assess their quality as being higher (2,95) than other nationalities. For other sites, there are no meaningful differences in average values.

*Table 7. Average assessment of quality of infrastructure based on nationality*

| | Information boards | Benches |
|---|---|---|
| Paljassaare | | |
| Estonian | 3,35 | 2,95 |
| Russian | 3,32 | 2,61 |
| Other | 2,5 | 2,25 |
| Kadriorg | | |
| Estonian | 3,24 | |
| Russian | 3,73 | |

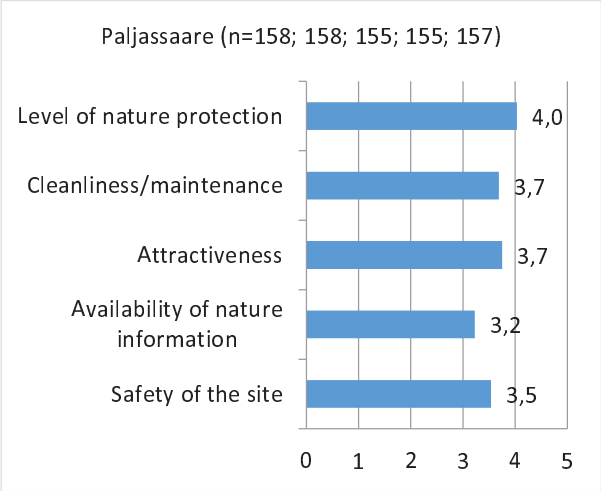
| | | |
|---|---|---|
| Other | 2.67 | |

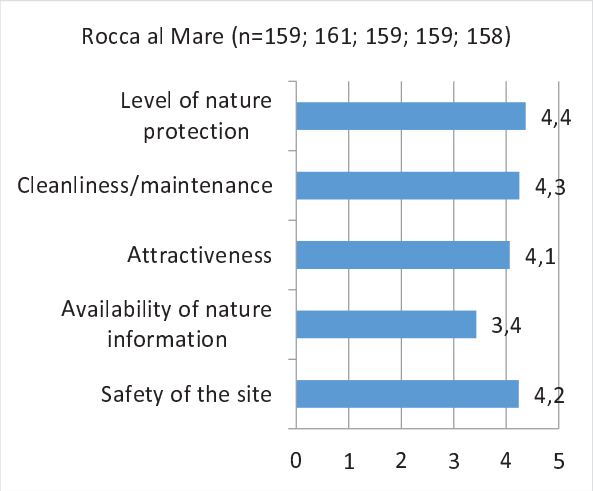
### 1.1.4.4. How the nature management of the site was evaluated

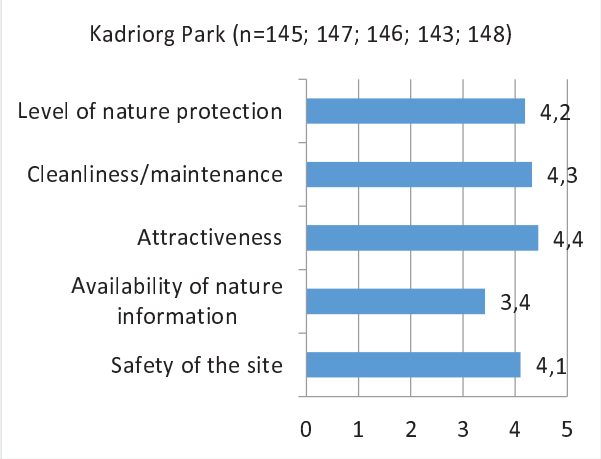
The survey question included the following sub-topics of management: *level of nature protection, cleanliness/maintenance, attractiveness, availability of information on the site's nature, safety of the site* (Q16).

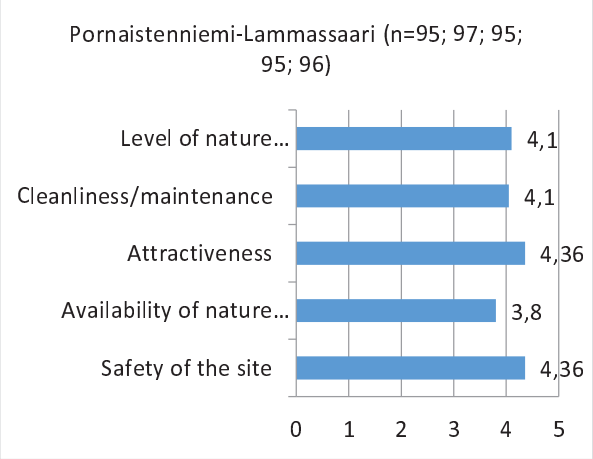
The respondents rated their satisfaction along a 1–5 point measurement scale (from "very poor" to "very good").

The level of satisfaction with nature protection received the highest scores in Paljassaare, Rocca al Mare and Harakka Island. In Pornaistenniemi-Lammassaari and Kadriorg, the respondents were most satisfied with attractiveness of the site. Satisfaction with the safety of the site received equally high assessment in Pornaistenniemi-Lammassaari. In all green areas, the respondents were least satisfied with the availability of nature information (Figure 33).



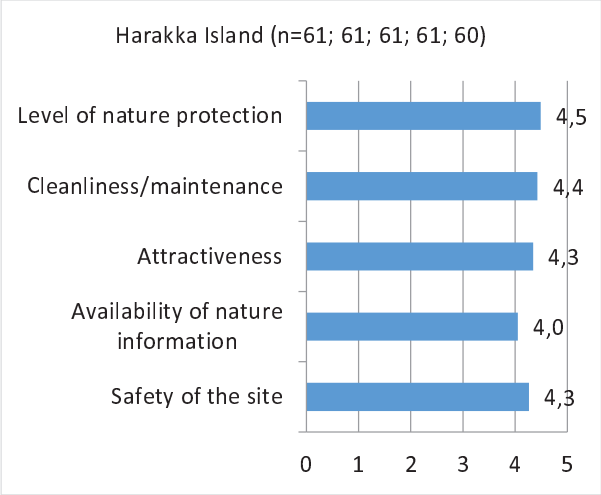



*Figure 33. Satisfaction with nature management at the site*

There were no differences between newcomers and visitors with longer history in their satisfaction with nature management on the site.

#### 1.1.4.5. Safety of a site as an indication of ecosystem disservices

Assessment on the **safety of a site** can be used as an indication of **ecosystem disservices** which are regarded as negative ecosystem functions for human well-being. Examples of such disservices in urban parks include fear of darker areas that are perceived as unsafe in night-time, animals/insects perceived as scary or unpleasant, older falling trees/branches, etc. (Gómez-Baggethun and Barton 2013).

These disservices were also mentioned in visitor interviews in Tallinn where the questionnaires included a possibility to comment on the safety of the sites. The visitors pointed out the following aspects, generated both by humans and ecosystems, which influenced their perception of safety:

- ✓ **people**: *noisy companies, nudists, drug addicts, etc.* (Paljassaare), *dangerous bikers and those moving at high speed if there are lot of people on the promenade; odd people and beer drinkers in the evenings* (Rocca al Mare), *drug dealers in the mornings at the Russalka side of the park* (Kadriorg)
- ✓ **animals**: *dangerous dogs and wild boars, wasp nests at White tower – wasps attacking people* (Paljassaare), *big dogs are running around, many unleashed dogs* (Kadriorg)
- ✓ **vegetation**: *some trees need to be cut down* (in Kadriorg, however, there was another, opposite comment too: *it's cool if old trees fall down and they are not taken away*)
- ✓ **infrastructure and maintenance**: *railings are missing at the coast; possibility to step into something sharp or sprain one's foot; footpaths are sinking, the coast is eroding* (Paljassaare), *streetlights are not working, more lighting!* (Kadriorg)

General comments about the perceived safety were: *now it's safer than years ago* (Paljassaare), *a bit more fearsome in the forest and in winter* (Rocca al Mare), *not safe in the dark; I feel myself safe!* (Kadriorg). Some people also commented on maintenance in general: *sometimes rubbish is stinking* (Rocca al Mare).

In Pornaistenniemi-Lammassaari, no one responded that the perceived safety of the site is either poor or very poor. In other sites, out of those who assessed the safety as poor or very poor, 7 people came to Paljassaare 7 alone and 14 people came in groups (the rest of the response options in Q4); in Rocca al Mare 2 came alone and 3 in groups; in Kadriorg 1 came alone and 3 in groups; in Harakka Island, the single such respondent came alone.

#### 1.1.4.6. Differences between respondent groups: gender, age and nationality

In the assessment of nature management and access, some **gender-based** differences occur (Table 8). In Rocca al Mare, compared to their male counterparts, females assessed the level of nature protection and attractiveness as being higher. In the other sites the average values are rather similar.

As for Kadriorg, the safety is assessed as being lower by females (4,02) compared to males (4,32). In Helsinki sites, the average values are generally similar and the only significant difference occurs in assessing access to Harakka Island: the average value for males is 3,7 and for females 4,4.

*Table 8. Average assessment of nature management and access based on gender*

| | Level of nature protection | | Attractiveness | | Safety on the site | | Access to the site | |
|---|---|---|---|---|---|---|---|---|
| | Males | Females | Males | Females | Males | Females | Males | Females |
| Rocca al Mare | 4,26 | 4,44 | 3,95 | 4,15 | | | | |
| Kadriorg | | | | | 4,32 | 4,02 | | |
| Harakka Island | | | | | | | 3,7 | 4,39 |

There are some differences in opinion of **age groups**, which occur in Helsinki sites (Table 9). All the relations are negative, which means that compared to younger people, **older people have assessed these issues as being lower**: the relationship holds for level of nature protection and maintenance in Pornaistenniemi-Lammassaari; but also maintenance, nature information availability and perception of safety in Harakka Island. In the Tallinn sites, different age groups have assessed these issues similarly.

*Table 9. Correlation between assessment of nature management and age group (Spearman correlation coefficients)*

| | Level of nature protection | Cleanliness/ maintenance | Availability of information | Safety on the site |
|---|---|---|---|---|
| P-Lammassaari | -0,308*** | -0,174* | | |

| | | | | |
|---|---|---|---|---|
| Harakka Island | | -0,244* | -0,250* | -0,299** |

A similar pattern related to **nationality** as in Q15 can be also noticed in Q16: in the Tallinn sites, Russians generally have the highest average assessments of the different aspects of nature management and access, and the nationality group "other" has the lowest assessments (Table 10). This holds for the cases of **attractiveness** of Paljassaare and **information availability** in Kadriorg. The low assessment of information availability in Kadriorg by non-Estonians/non-Russians is represented by a comment made by a Norwegian: *information is only in Estonian and Russian*.

Only perceived **safety** stands out with different pattern: other nationalities have assessed the safety in Kadriorg as being the highest (4,75), and Estonians the lowest (4,03).

For the Helsinki sites, the assessment by tourists and local people are generally similar. The only exception is the **level of nature protection** in Pornaistenniemi-Lammassaari, which received a significantly higher score by tourists (4,6) than by local people (4,03).

*Table 10. Average assessment of quality of nature management based on nationality*

| | Level of nature protection | Cleanliness / maintenance | Attractiveness | Availability of information | Safety on the site | Access to the site |
|---|---|---|---|---|---|---|
| Paljassaare | | | | | | |
| Estonian | | | 3,67 | | | |
| Russian | | | 4,07 | | | |
| Other | | | 3,17 | | | |
| Kadriorg | | | | | | |
| Estonian | | 4,29 | | 3,39 | 4,03 | 4,33 |
| Russian | | 4,67 | | 3,93 | 4,25 | 4,73 |
| Other | | 4,25 | | 2,86 | 4,75 | 4,25 |
| P-Lammassaari | | | | | | |
| Finns | 4,07 | | | | | |
| Other | 4,6 | | | | | |

### 1.1.4.7.How the respondents evaluated the natural area of the site

In this question (Q17) we explored the visitors' satisfaction with *the size, appearance, amount of visitors and development of the natural areas within the site*. The response options were predefined and there was a possibility to provide comments in the response.

The majority of the responses indicated satisfaction with the current level of surveyed aspects (Figure 34).

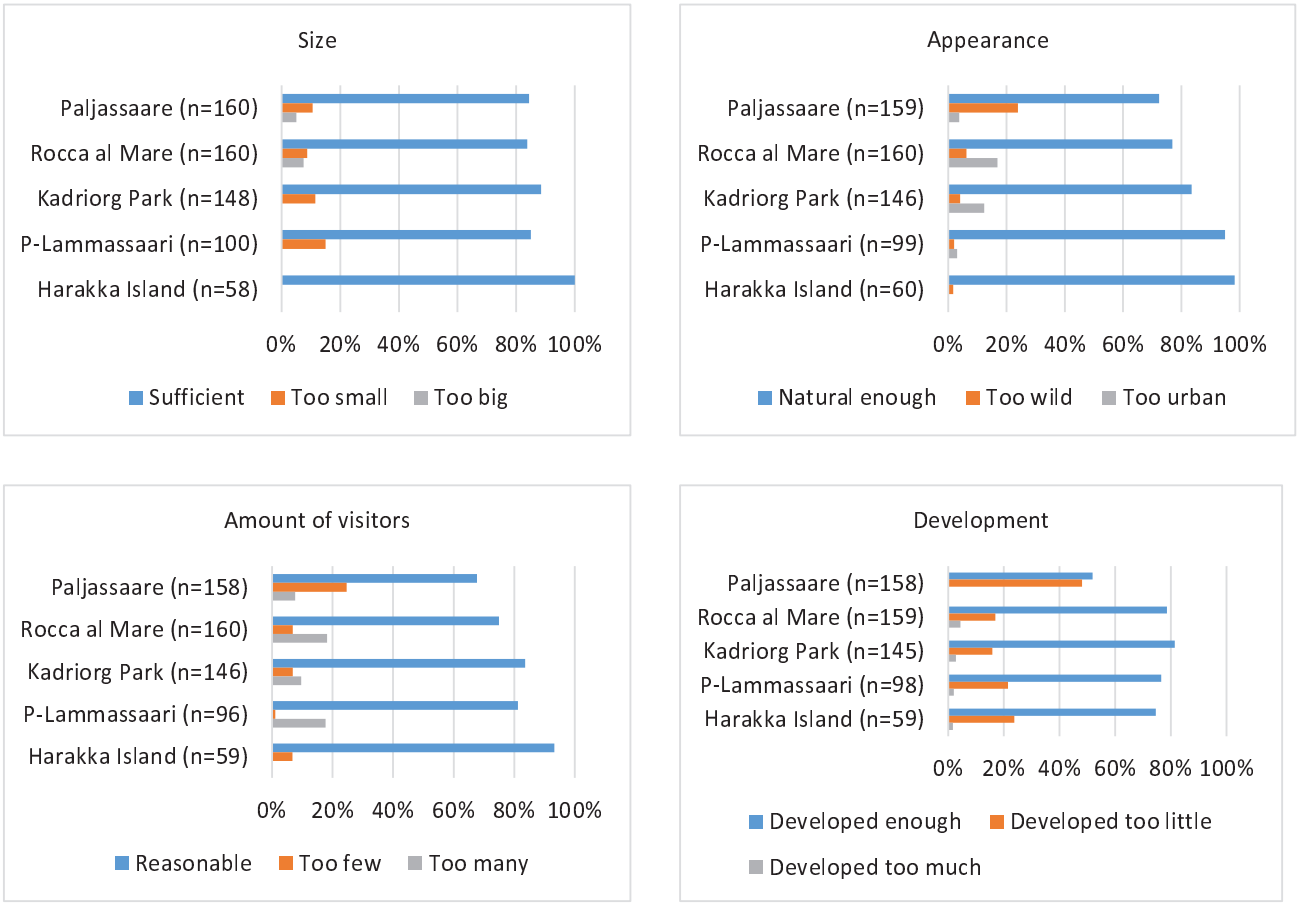



*Figure 34. Satisfaction with the size, appearance, amount of visitors and development of the sites*

The most divergent opinions can be observed in Paljassaare on the question of how developed the green area is: 52% answered that the site has been developed enough, while in the opinion of 48% respondents – too little.

Consequently, most of the comments in **Paljassaare** also concerned its development:
**Those who were satisfied with the current development**, pointed out that *if there was more development, also more people would come to the site which is not desirable*; *a big bonus that the site is not developed*; *there is no need at all to develop the site more*; *good that the site is not very developed – it is possible to discover it by yourself and enjoy the wilderness*; *development is not necessary, don`t want more people here, but the bird watching towers could be higher*.

**Those who wished more development** indicated that *the site has not been developed at all* or made specific proposals: *to open a good café at the parking lot on weekends*; *to provide places to sit*; *to keep toilet and changing cabins on the beach available after summer too*; *to set up a dog walking area and at the Katariina Quay a kite surfing area*.

**Comments on appearance**: *too much military stuff – could be cleaned up; need to clean up at the wastewater plant*.
**Comments on size**: *at present the size is sufficient, soon it will be too small*.
**Comments on visitors**: *amount of visitors depends on the season; nudists are disturbing*.

In **Rocca al Mare**, **the comments on development** were: *very suitable for walking; wooden benches are great, the metal ones are a bit cold; too short for bike riding, something could be done on the wasteland; skiing tracks are needed in winter*.

**Comments on visitors**: *the amount of visitors depends on the time/day; sometimes there are no visitors at all*.

In **Kadriorg** there were lot of **comments on development**: *urban noise is especially high in the Pirita side of the park – more trees for a barrier; more attractions are needed: a café near the Japanese Garden, to get some warm drinks and a place to sit (e.g. in autumn), cafés near the Swan Pond are overcrowded; too few toilets; water taps are missing*.

**Benches**: *there could be more benches between the Palace and the Swan Pond; more sitting places in various design, some of them for lying down, reading: Estonian design could be used; more various sitting places*.
**Roads**: *less gravel roads; road surface should be other than fine gravel which sticks to the shoe sole; road surfaces could be better (harder), especially in the central part (near the stone); separate paths for people walking the dogs*.
**Lighting**: *lighting is missing on one road; lighting is needed in the eastern part of the park*.
**Information**: *more information, so that tourists could find this site*.

Several respondents complained about **some unsuitable events and the amount of people**: *the daily amount of visitors is reasonable, too many during events; massive events; "Light Walks in Kadriorg" – rather not, good in the daytime, but loud music at night frightens all the animals-birds, small lighting and candles at day are OK, fireworks definitely NOT and shouldn`t be allowed; exhibition on the pond – a big no!* From the positive side, it was mentioned in one comment that *running and similar events are nice*.

**Comments on appearance**: *partly the appearance is too wild; more mowing in summertime – grass is too high; near the stadium, in the circle, the grass is high; I wish that old trees were protected more; in summer sunbathing should be prohibited in front of the Palace*.

One respondent expressed an opinion that *the urban park is different and cannot be totally noise-free: therefore limiting traffic or changing anything there wouldn`t be reasonable, if you like to be in tranquillity, you will rather go out of the town*.

In **Pornaistenniemi-Lammassaari**, the comments on **development** were: *boardwalks in poor condition (partly); a bit too narrow boardwalk; new boardwalks are needed; the boardwalk could be fixed, boardwalk components move around (are not steady/stable); bigger bird watching towers; café*.

**Comments on visitors:** *the amount of joggers grows quickly – not suitable for boardwalks; too many visitors, but the site is in the middle of Helsinki; too many dogs – why are there no dog-free areas in Helsinki; other visitors are friendly to dogs*.

**Comments on appearance**: *worn out, nettles; reed more than 3 m high; trash; not really in a natural state, but good state considering it is Helsinki*.

In **Harakka Island**, all the respondents agreed that the size of the natural area is sufficient, obviously due to the fact that it is an island. The additional comments to the question were: *being English-speaking the information wasn't much good for me*; *paths are partly very muddy, especially for children*; *partly difficult for those with limited physical mobility*.

Those who were on the opinion that there were **too many visitors** at the site were predominantly local people – from other nationalities than Estonians and Russians there was one such response in Kadriorg (out of 14 in total).

Also it was mostly local people who felt who were of the opposite opinion that there were **too few visitors** at the site. There were also four such opinions by other nationalities in Paljassaare (out of total 39), one in Pornaistenniemi-Lammassaari (out of 1) and one in Harakka island (out of 4).

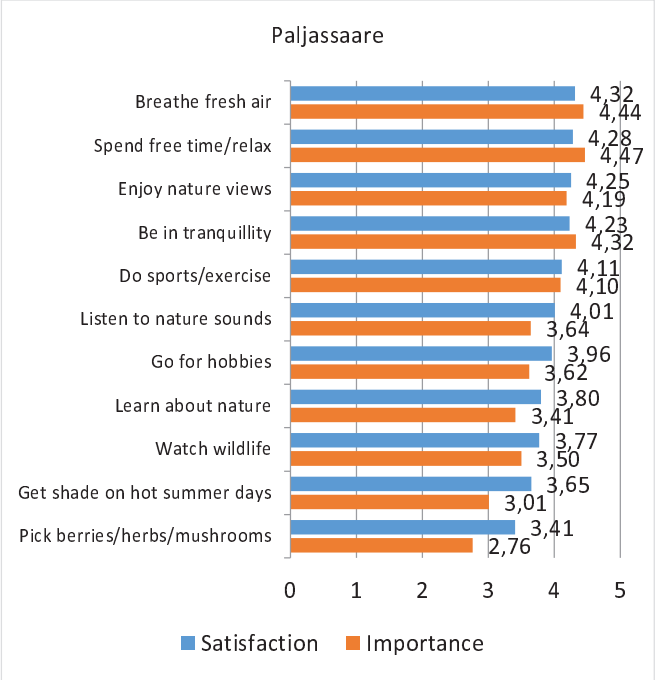
#### 1.1.4.8. How the importance of and satisfaction with activities enabled by ecosystem services were evaluated

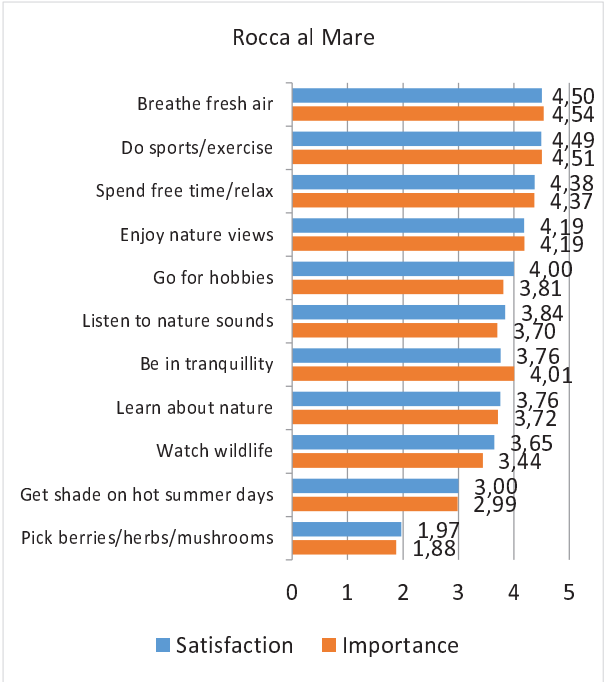
The question consisted of 11 activities which refer to ecosystem services of urban green areas: *spending free time/relax; enjoying nature views; learning about nature; listening to nature sounds; watching birds, butterflies and other wildlife; picking berries/herbs/mushrooms; doing sports/exercising; going for hobbies (photographing, drawing etc.); breathing fresh air; being in tranquillity, away from urban environment and noise; getting shade on hot summer days* (Q18).

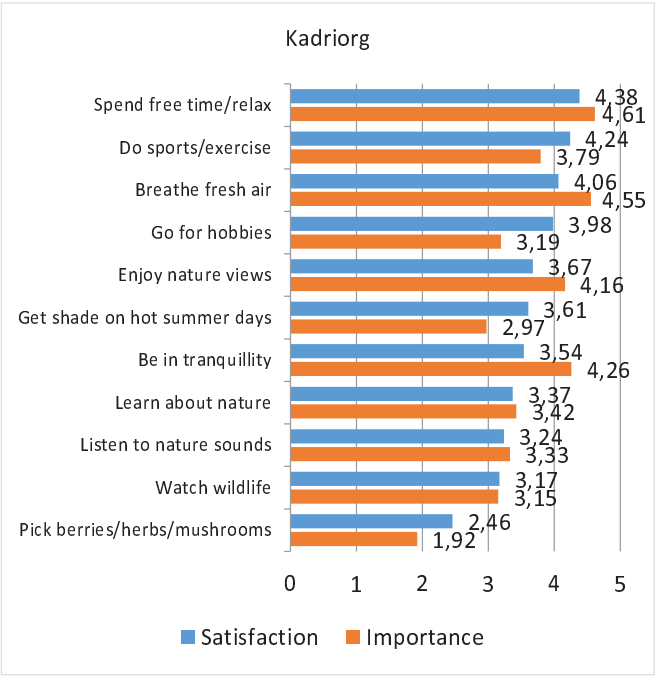
Of those activities the last three ones characterise **regulating ecosystem services** (regulation of air quality by urban trees and forests, noise reduction and urban temperature regulation), *picking berries/herbs/mushrooms* is a **provisioning ecosystem service** and the rest are **cultural ecosystem services**.

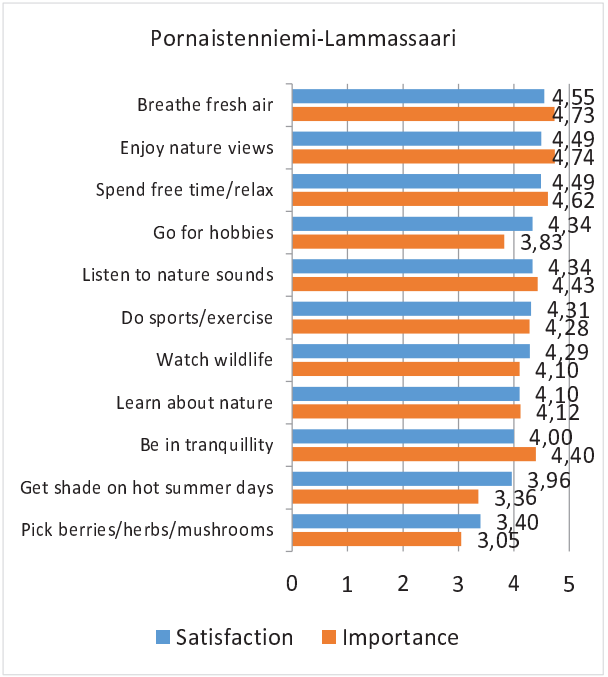
First the respondents were asked to rate each activity according to the importance of having a possibility for this activity in urban green areas. Secondly, they were asked to rate the satisfaction with the possibility for each activity at the interview site. The scores were given on a 5-point scale, which ranged from "1 – not important/satisfied at all" to "5 – very important/satisfied".

The graphs on Figure 35 show the results ranked by average satisfaction with the activities at the site.


Paljassaare
Breathe fresh air 4,32 4,44
Spend free time/relax 4,28 4,47
Enjoy nature views 4,25 4,19
Be in tranquillity 4,23 4,32
Do sports/exercise 4,11 4,10
Listen to nature sounds 4,01 3,64
Go for hobbies 3,96 3,62
Learn about nature 3,80 3,41
Watch wildlife 3,77 3,50
Get shade on hot summer days 3,65 3,01
Pick berries/herbs/mushrooms 3,41 2,76
0 1 2 3 4 5
Satisfaction Importance


Rocca al Mare
Breathe fresh air 4,50 4,54
Do sports/exercise 4,49 4,51
Spend free time/relax 4,38 4,37
Enjoy nature views 4,19 4,19
Go for hobbies 4,00 3,81
Listen to nature sounds 3,84 3,70
Be in tranquillity 3,76 4,01
Learn about nature 3,76 3,72
Watch wildlife 3,65 3,44
Get shade on hot summer days 3,00 2,99
Pick berries/herbs/mushrooms 1,97 1,88
0 1 2 3 4 5
Satisfaction Importance


Kadriorg
Spend free time/relax 4,38 4,61
Do sports/exercise 4,24 3,79
Breathe fresh air 4,06 4,55
Go for hobbies 3,98 3,19
Enjoy nature views 3,67 4,16
Get shade on hot summer days 3,61 2,97
Be in tranquillity 3,54 4,26
Learn about nature 3,37 3,42
Listen to nature sounds 3,24 3,33
Watch wildlife 3,17 3,15
Pick berries/herbs/mushrooms 2,46 1,92
0 1 2 3 4 5
Satisfaction Importance


Pornaistenniemi-Lammassaari
Breathe fresh air 4,55 4,73
Enjoy nature views 4,49 4,74
Spend free time/relax 4,49 4,62
Go for hobbies 4,34 3,83
Listen to nature sounds 4,34 4,43
Do sports/exercise 4,31 4,28
Watch wildlife 4,29 4,10
Learn about nature 4,10 4,12
Be in tranquillity 4,00 4,40
Get shade on hot summer days 3,96 3,36
Pick berries/herbs/mushrooms 3,40 3,05
0 1 2 3 4 5
Satisfaction Importance

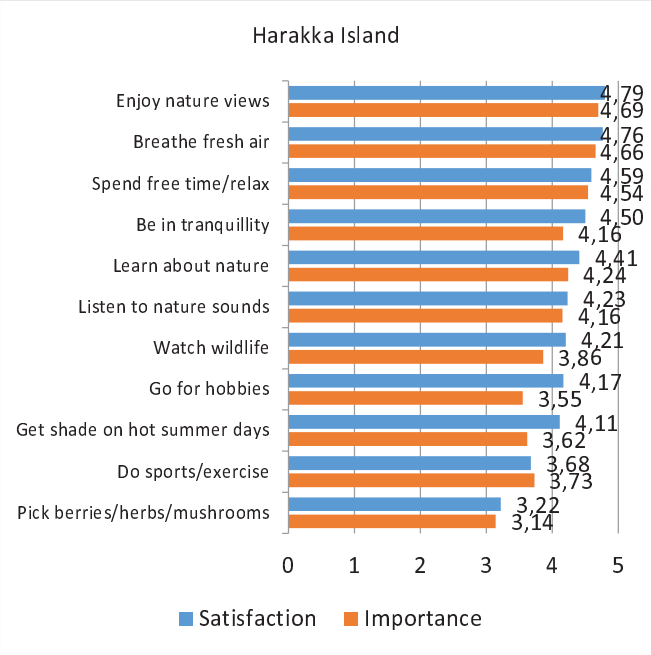



*Figure 35. Importance of having a possibility for the listed activities in urban green areas and satisfaction with the possibility for these activities at the site*

By green areas, most of all the respondents **are satisfied with** the possibilities **to breathe fresh air** in Paljassaare (4,32), in Rocca al Mare (4,50) and in Pornaistenniemi-Lammassaari (4,55); **to spend free time** in Kadriorg (4,38) and **to enjoy nature views** in Harakka Island (4,79).

In general, the possibilities which were ranked as **the most important** by all respondents (average score above 4) are the following: **to breathe fresh air** (4,56), **to spend free time** (4,51), **to enjoy nature views** (4,32), **to be in tranquillity** (4,23) and **to do sports/exercise** (4,12).

Site specifically, the most important possibilities in urban green areas for the site respondents are **to spend free time** (Paljassaare – 4,47, Kadriorg – 4,61), **to breathe fresh air** (Roccal al Mare – 4,54) and to **enjoy the views of nature** (Pornaistenniemi-Lammassaari – 4,74, Harakka – 4,69).

The activity considered least important in all urban green areas is **picking berries, herbs or mushrooms** (average score 2,43). Hence, the importance of cultural and regulating ecosystem services in urban green areas was rated higher than the importance of provisioning ecosystem service.

#### 1.1.4.9. Differences between respondent groups: gender, age, nationality and visiting history

As can be seen from Table 11, **females assess the importance of certain activities higher than males**, and it is specifically the case for respondents in Rocca al Mare and Kadriorg. There are fewer significant differences across gender in Helsinki sites. Paljassaare is not included in the table, as no significant differences across gender occurred there.

*Table 11. Average assessment of importance of different activities based on gender*

| | Rocca al Mare | | Kadriorg | | P-Lammassaari | | Harakka Island | |
|---|---|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female | Male | Female |
| Spend free time | 4,17 | 4,52 | | | 4,46 | 4,71 | 4,19 | 4,71 |
| Enjoy nature views | 3,77 | 4,48 | | | | | | |
| Learn about nature | 3,40 | 3,93 | 3,15 | 3,52 | | | | |
| Listen to nature sounds | 3,32 | 3,97 | 2,95 | 3,49 | | | | |
| Watch wildlife | 3,03 | 3,73 | | | | | | |
| Pick berries, herbs, mushrooms | | | | | | | 2,69 | 3,38 |
| Do sports/exercise | | | 3,36 | 3,95 | 3,82 | 4,59 | | |
| Go for hobbies | | | 2,76 | 3,37 | | | | |
| Breathe fresh air | 4,42 | 4,63 | 4,33 | 4,63 | 4,63 | 4,79 | | |
| Be in tranquillity | 3,71 | 4,22 | 4,05 | 4,33 | | | | |

If looking at the importance of different activities assessed **according to age**, it can be seen that **certain activities are more important for young people** (Table 12). This can be witnessed by negative correlation coefficient, as the importance of activities is ranked from 1 (not at all important) to 5 (very important). Hence negative correlation coefficient means that younger age groups rank their importance higher and older age groups rank their importance lower, for example in the case of **sporting** (Kadriorg, Rocca al Mare and Pornaistenniemi-Lammassaari).

In Pornaistenniemi-Lammassaari there is a pattern that the importance of several activities is rated higher by younger people than by older people.

There are two activities which are assessed as more important by **older people**: the importance of **watching wildlife and being in the shade** on hot summer days (in these cases, there is a positive correlation between age group and importance of the activity).

*Table 12. Correlation between importance of activities and age (Spearman correlation coefficients)*

| | Paljassaare | Rocca al Mare | Kadriorg | P-Lammassaari | Harakka Island |
|---|---|---|---|---|---|
| Spend free time | | | | -0,367*** | |
| Enjoy nature views | | | | -0,262*** | |

| | | | | | |
|---|---|---|---|---|---|
| Watch wildlife | | 0,214*** | 0,204** | | 0,261** |
| Pick berries, herbs, mushrooms | | | | -0,375*** | |
| Do sports/exercise | | -0,164** | -0,217*** | -0,185* | |
| Breathe fresh air | | | | -0,260** | |
| Be in tranquillity | | -0,140* | | -0,250** | |
| Get shade on hot summer days | 0,179** | 0,198** | 0,250*** | | |

As can be seen from Table 13, there is a pattern that the **nationality group** "other" values the activities related to nature more highly than local people. This holds in the case of listening to nature sounds, watching wildlife, picking berries. While local people may be used with these activities not only in urban green areas, for foreigners in their home countries urban green areas may offer the only possibility to be in contact with nature.

However, the pattern can be mostly noticed in the Tallinn sites and not so much in the Helsinki sites.

*Table 13. Average assessment of importance of different activities in urban green areas based on nationality*

| | Estonians | Russians | Other | Finns |
|---|---|---|---|---|
| Listen to nature sounds | | | | |
| *Paljassaare* | 3,53 | 3,91 | 4,5 | |
| *Rocca al Mare* | 3,59 | 4,44 | 5 | |
| *Pornaistenniemi-Lammassaari* | | | 5 | 4,39 |
| Watch birds, wildlife | | | | |
| *Paljassaare* | 3,36 | 3,81 | 4,25 | |
| *Rocca al Mare* | 3,35 | 4 | 4,67 | |
| Pick berries, herbs, mushrooms | | | | |
| *Rocca al Mare* | 1,76 | 2,56 | 3,33 | |
| Do sports/exercise | | | | |
| *Rocca al Mare* | 4,53 | 4,18 | 5 | |
| *Kadriorg* | 3,93 | 3,6 | 2,25 | |

**In most of the cases**, the average assessment of importance and satisfaction with different activities on green areas, **do not differ between newcomers and visitors with longer history**. In Paljassaare, the newcomers have assessed the importance of going to the site for hobbies (photography, drawing, etc) much higher than the visitors with longer history (4,1 and 3,4 respectively), but the importance of being in tranquillity is of higher importance for visitors with longer history (4,4 vs 4,1). In Rocca al Mare, the importance of

being in tranquillity is similarly less important for newcomers, while in Lammassaari, the trend is vice versa (Table 14).

*Table 14. Average assessment of importance of activities based on the length of history in visiting the site*

| | Go for hobbies | | Be in tranquillity | |
|---|---|---|---|---|
| | Newcomers | Longer history | Newcomers | Longer history |
| Paljassaare | 4.1 | 3.4 | 4.1 | 4.4 |
| Rocca al Mare | | | 3.5 | 4.1 |
| P-Lammassaari | | | 4.7 | 4.3 |

As regards to satisfaction with different activities, compared to newcomers, the **respondents with a longer site visiting history are more satisfied** with spending free time in Paljassaare and Rocca al Mare, with learning about nature in Harakka Island and with watching birds in Paljassaare (Table 15).

*Table 15. Average assessment of satisfaction with activities on sites based on the length of history in visiting the site*

| | Spend free time /relax | | Learn about nature | | Watch birds, wildlife | |
|---|---|---|---|---|---|---|
| | Newcomers | Longer history | Newcomers | Longer history | Newcomers | Longer history |
| Paljassaare | 4.1 | 4.4 | | | 3.5 | 3.9 |
| Rocca al Mare | 4.1 | 4.5 | | | | |
| Harakka Island | | | 4.3 | 4.7 | | |

#### 1.1.4.10. How the importance of social and cultural benefits for the city provided by the site's nature was evaluated

The question explored six non-economic social and cultural values provided by the sites: *improved mental and physical public health from spending time at the site; attractive neighbourhood for living; tourism destination; place for environmental education; place for cultural activities; place for aesthetic appreciation and inspiration* (Q19). The perceived importance of these cultural and social benefits was asked to evaluate on a 5-point scale (from 1 – "not at all important" to 5 – "very important").

The results indicate that all sites are valued very highly for their **contributions to mental and physical health**. Out of the six potential benefits, health benefits were ranked highest in Tallinn sites (Figure 36). Pornaistenniemi-Lammassaari is especially valued for its **aesthetic importance and inspiration**. Harakka Island was perceived to play the most important **role in environmental education** for the city inhabitants and tourists.

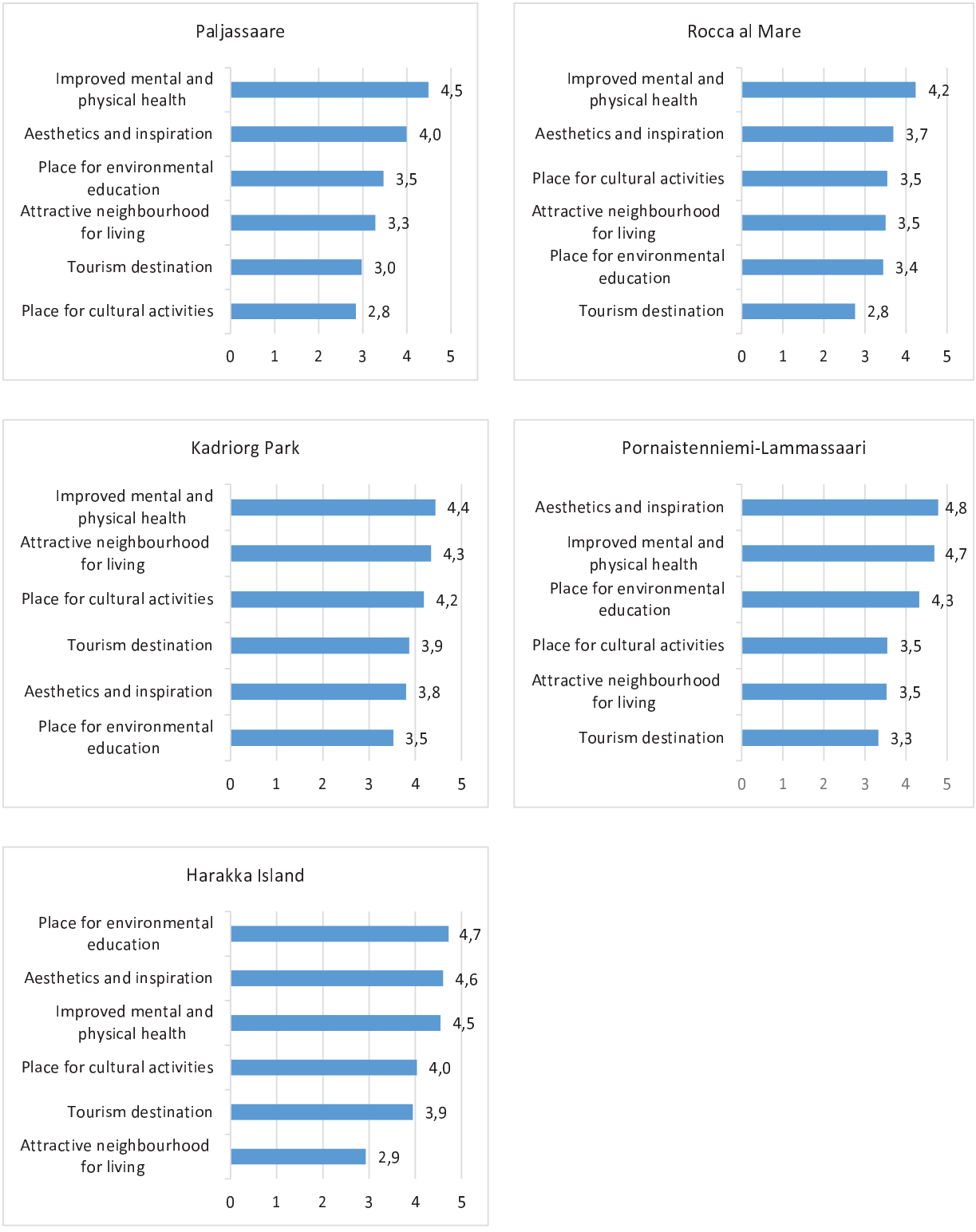



*Figure 36. Importance of cultural and social benefits for the city provided by the site's nature*

# 2. Electronic counting

## 2.1. Aim

The aim of electronic counting was to gather information about the number, routes and directions of visitors in Paljassaare Bird Conservation Area.

This area functions as a green corridor and bird migration route in the urban environment and is sensitive to visitor pressure. The new data gives vital information for appropriate visitor management in all parts of the bird conservation area and enables a more sophisticated approach to visitor management.

## 2.2. Methodology

The visitors were counted with three infrared Pyro Sensor devices from Eco-Counter[3]. The devices were installed on 20 June 2016 in three locations of Paljassaare which would cover all the main entrances to the different parts of the conservation area (Figure 37).

*Figure 37. Location of three infra-red visitor counters in Paljassaare Bird Conservation Area*

The PYRO Sensor devices count pedestrians and cyclists who pass the road by detecting their body temperature and detect the direction of people's movement. The sensor should work in all weather conditions while the slab-type counter, which has previously been used in Paljassaare, tended not to work properly during winter months. The slab

[3] http://www.eco-compteur.com/en/products/pyro-range/pyro-sensor

was installed inside the gravel path leading to the tip of Väike-Paljassaare peninsula in 2010. The device counted people stepping on the slab.

The PYRO sensor data can be downloaded from the server by hour, day, week and month. The counting was carried out in the period from 21 June to 31 December 2016.

## 2.3. Results

The counting data is presented below on a monthly, weekly, daily and hourly basis.

By comparing the data from three infrared counters, some significant fluctuations from the average can be seen in all three datasets. The reasons for these fluctuations are not known, but some assumptions can be made. In June and early July 2016, counter "Paljassaare tee" had one long episode of very high visitor numbers (29.06–9.07.2016) inwards direction which did not correspond to other movements recorded by the same counter (outwards) or other counters (Figure 38). The reason for this overestimation error could have resulted from some insects on the sensor. Two simultaneous peaks of two counters in August 2016 that are seen in Figure 38 seem to indicate to two sporting events taking place in Paljassaare (probably mountain biking).

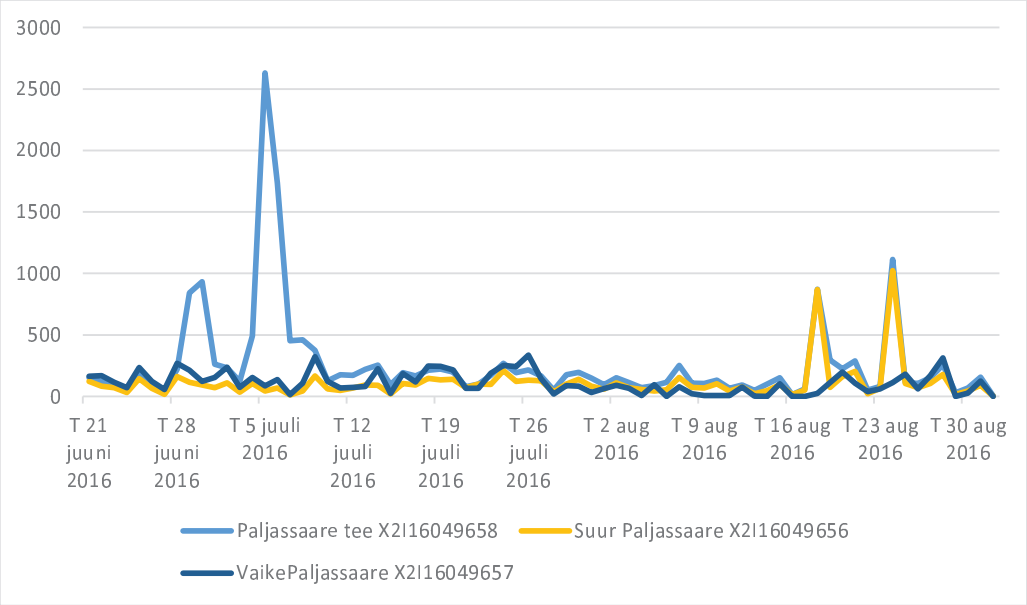



*Figure 38. Daily visitor numbers (both directions combined) in the summer months as recorded by the 3 Pyro Sensor counters*

On Figure 39, the significant overestimated numbers are excluded and the visitor numbers from the last week of June and first week of July in "Paljassaare tee" are shown as "1200", which should correspond to actual number of passes.

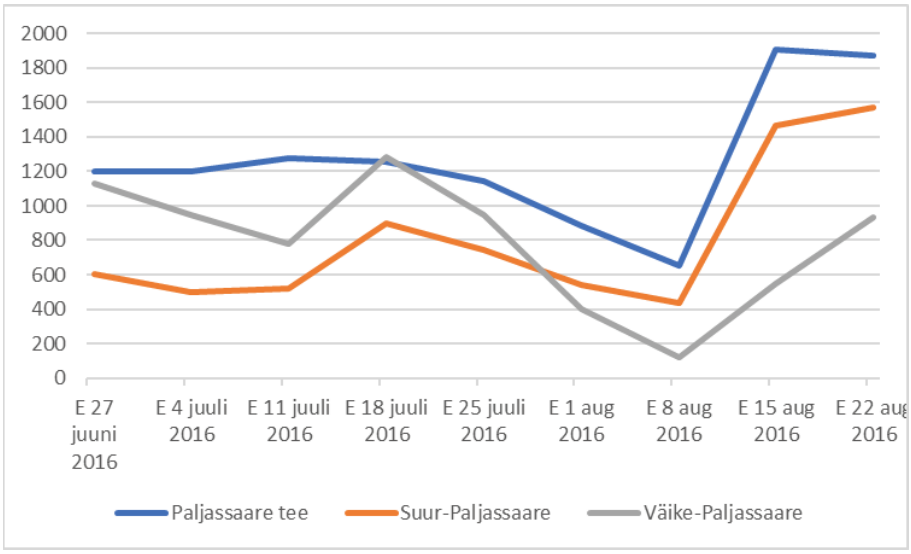



*Figure 39. Weekly number of visitors (both directions combined) counted by Pyro Sensor counters in Paljassaare during 9 summer weeks in 2016.*

An underestimation error occurred in the data of Suur-Paljassaare counter from the period 7.09.2016 to 18.11.2016; the reason of that is unknown. In November 2016, part of the Väike-Paljassaare counter was stolen; therefore there is no respective accurate data for the two last months of the year (Table 16).

*Table 16. Number of monthly visitors in Paljassaare Bird Conservation Area in July–December 2016*

| | Paljassaare tee | Suur-Paljassaare | Väike-Paljassaare |
|---|---|---|---|
| July | 5281* | 1435 | 2209 |
| August | 2787 | 2084 | 1076 |
| September | 1666 | 241* | 1919 |
| October | 859 | 1* | 844 |
| November | 332 | 151* | 53* |
| December | 435 | 326 | 0* |

* data is of low accuracy.

It can be concluded that **summer months are the most visited time** of the year in Paljassaare**Error! Reference source not found.**. This confirms the responses of on-site interviews where summer was the most preferred season for visiting Paljassaare (chapter 1.1.3.5). However, the number of visitors also depends on the weather.

Based on the harmonised data, it can be evaluated that on average **88 visitors per day** used the main road of Paljassaare Bird Conservation Area during July and August 2016. 61% of the visitors also moved in the farthest part of the conservation area (Suur-Paljassaare). In autumn months (September–November), on average **31 people** in a day moved along the same Paljassaare road (Table 17).

The maximum number of visitors on the main road (Paljassaare tee) per day in the summer was **522/591 (in/out)** on Wednesday, 24 August 2016, and in the autumn **125/134** on Sunday, 11 September 2016 (Table 17).

*Table 17. Average and maximum daily number of visitors in Paljassaare Bird Conservation Area, July–December 2016*

| | Average daily number of visitors | | | Maximum daily number of visitors | | |
|---|---|---|---|---|---|---|
| | Paljassaare tee (in/out) | Suur-Paljassaare (in/out) | Väike-Paljassaare (in/out) | Paljassaare tee (in/out) | Suur-Paljassaare (in/out) | Väike-Paljassaare (in/out) |
| | **2016** | | | **2016** | | |
| July | 222,8/117,9* | 46,5/46,0 | 52,2/90,3 | 1772/858* | 105/105 | 145/210 |
| August | 85,9/93,9 | 68,1/66,3 | 20,8/48,6 | 522/591 | 507/516 | 103/209 |
| September | 50,7/60,3 | 8,1/8,0* | 52,5/75,5 | 112/134 | 59/59 | 158/175 |
| October | 24,8/30,6 | 0,0/0,0* | 16,0/38,5 | 81/111 | 0/1* | 39/142 |
| November | 11,7/10,4 | 4,7/5,3* | 0,9/2,7* | 30/46 | 36/32 | 5/17* |
| December | 11,7/16,3 | 10,1/10,9 | 0,0/0,0* | 32/55 | 39/41 | 0/0* |
| Average summer months (July-August) | 130* | 57 | 53 | | | |
| Average autumn months (Sept.-Nov.) | 31 | 4* | 31 | | | |

– counting data for a whole month is not available;
* data is of low accuracy.

While counters "Paljassaare tee" and "Suur Paljassaare" have an average of 4–10% difference in the number of inward and outward traffic, then Pyro Sensor counter "Väike-Paljassaare" has 2–3-fold difference (Figure 40). Outward traffic is higher than inward traffic. This refers to misinterpretation of numbers by the counter, because the counter is situated on a dead-end path where there are no alternative routes in or out of the area. Hence the difference in visitor numbers entering and exiting the peninsula should be much less than 1%. For future analysis it is important to find out which of the numbers of counter "Väike-Paljassaare" are incorrect – inward or outward traffic.

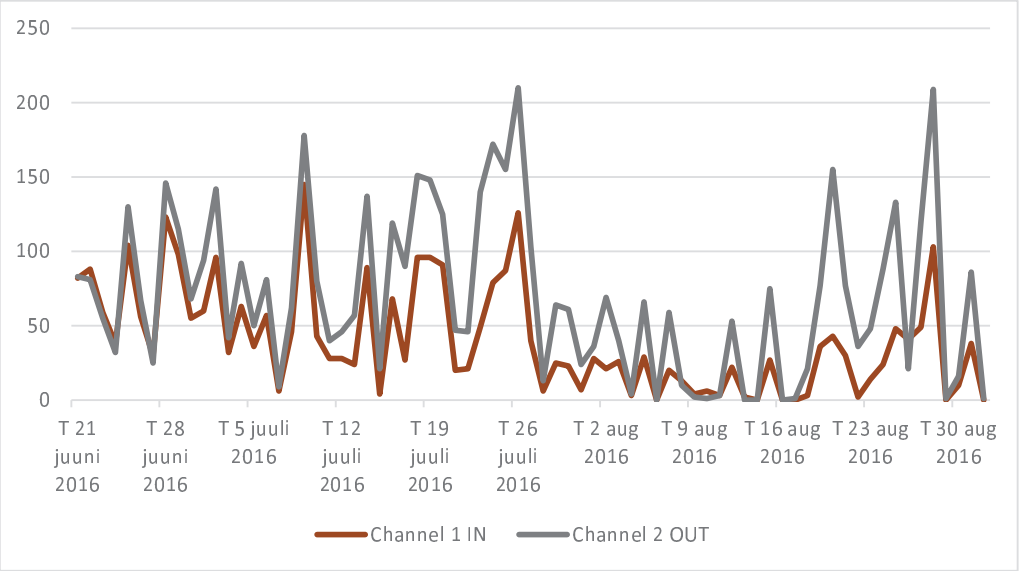



*Figure 40. Number of visits counted by counter "Väike Paljassaare" in the inward and outward directions*

By comparing the number of visitors on an hourly basis, it can be seen from Table 18 that **on weekdays**, the majority of people preferred visiting Paljassaare green area either **in the morning or in evening**, **on weekends** mostly during the **daytime**.

*Table 18. Hourly number of visitors in Paljassaare Bird Conservation Area during July-October 2016*

| Date | Day | Time | Number of visitors* ("Paljassaare tee", in/out) |
|---|---|---|---|
| 8.07. 2016 | Fri | 9:00 | 30/2 |
| 7.07.2016 | Thu | 10:00 | 32/6 |
| 8.07.2016 | Fri | 10:00 | 32/2 |
| 21.08.2016 | Sun | 12:00 | 18/14 |
| 28.08.2016 | Sun | 12:00 | 15/17 |
| 8.07.2016 | Fri | 12:00 | 29/2 |
| 21.08.2016 | Fri | 13:00 | 23/16 |
| 9.07.2016 | Sat | 13:00 | 15/17 |
| 11.09.2016 | Sun | 14:00 | 32/18 |
| 28.08.2016 | Sun | 14:00 | 23/17 |
| 9.07.2016 | Sat | 14:00 | 30/9 |
| 16.07.2016 | Sat | 14:00 | 25/8 |
| 21.08.2016 | Sun | 14:00 | 17/14 |
| 28.08.2016 | Sun | 15:00 | 14/33 |
| 24.07.2016 | Sun | 15:00 | 26/20 |
| 21.08.2016 | Sun | 15:00 | 15/22 |
| 8.07.2016 | Fri | 15:00 | 27/7 |
| 9.07.2016 | Sat | 15:00 | 24/10 |
| 7.08.2016 | Sun | 15:00 | 20/12 |
| 17.09.2016 | Sat | 15:00 | 5/26 |
| 25.09.2016 | Sun | 16:00 | 15/26 |
| 21.08.2016 | Sun | 16:00 | 14/24 |
| 24.08.2016 | Wed | 16:00 | 32/6 |
| 4.09.2016 | Sun | 16:00 | 14/24 |
| 9.07.2016 | Sat | 16:00 | 16/21 |
| 18.08.2016 | Thu | 16:00 | 28/9 |
| 20.08.2016 | Sat | 16:00 | 16/20 |
| 11.09.2016 | Sun | 16:00 | 12/21 |
| 4.07.2016 | Mon | 17:00 | 27/10 |
| 9.07.2016 | Sat | 17:00 | 12/23 |

| | | | |
|---|---|---|---|
| 4.07.2016 | Mon | 18:00 | 27/13 |
| 19.10.2016 | Wed | 18:00 | 4/35 |
| 8.07.2016 | Fri | 18:00 | 33/2 |
| 7.08.2016 | Sun | 18:00 | 13/22 |
| 9.07.2016 | Sat | 18:00 | 21/13 |
| 23.07.2016 | Sat | 18:00 | 12/20 |
| 6.07.2016 | Wed | 19:00 | 37/13 |
| 7 .07.2016 | Thu | 19:00 | 32/3 |

| | | | |
|---|---|---|---|
| 10.09.2016 | Sat | 19:00 | 14/17 |
| 26.07.2016 | Tue | 20:00 | 12/23 |
| 19.07.2016 | Tue | 20:00 | 18/16 |
| 2.08.2016 | Tue | 20:00 | 15/19 |
| 25.07.2016 | Mon | 21:00 | 6/28 |
| 6.07.2016 | Wed | 21:00 | 25/7 |
| 4.07.2016 | Mon | 22:00 | 24/12 |
| 6.07.2016 | Wed | 22:00 | 32/4 |

* only hours with more than 30 inward and outward movements of visitors are shown in the table.

The electronic counting of visitors will be continued in Paljassaare until the end of the NATTOURS project in May 2018 in order to compare the data collected during 2016, 2017 and 2018.

# 3. Mobile positioning survey

## 3.1. Aim

The aim of mobile positioning survey was to gather information about the number and origin of visitors in Paljassaare and Kadriorg Park areas. The mobile positioning method provides the mobile location data of the visitors (mobile phone users), where they are from (origin) and where they go (destination).

## 3.2. Methodology

The mobile positioning survey was carried out in Paljassaare peninsula and Kadriorg Park area by OÜ Positium LBS in the time period 1.09.2016–30.09.2016. The areas under investigation were defined by the coverage of signals of mobile antennas (Figure 41). However, the coverage is defined according to theoretical calculations and thus in reality the exact coverage may differ from the area shown in the figure below. For example, in Paljassaare the mobile antennas may also catch mobile signals of call activities from the ships passing by the peninsula, although in general the mobile phone service for these ship routes is provided by mobile antennas located in Viimsi peninsula.

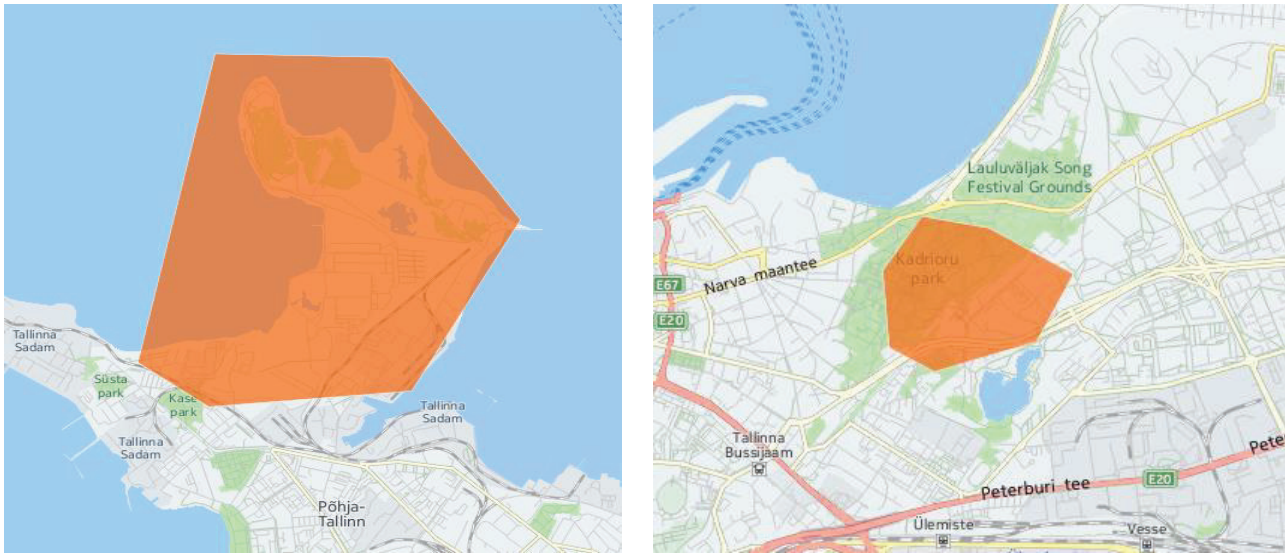



*Figure 41. Areas where mobile positioning method was applied: Paljassaare peninsula (on the left) and Kadriorg Park area (on the right)*

The current mobile positioning study used passive mobile positioning data – secondary data concerning the location of call activities in network cells, which is automatically stored in the log files of service providers (Ahas et al. 2009).

Service providers are mobile network operators in Estonia, but due to the requirement of confidentiality, the number and names of operators whose data is used in a specific study area is not disclosed.

The mobile positioning database consists of anonymous call detail records (CDR) which enables to evaluate the total number of visitors per day within an area, split by domestic and foreign tourists; the origin of tourists (municipality if they came from Estonia, country if they came from abroad), duration of foreign tourists' stay and other places (municipalities) visited in Estonia by foreign tourists.

For each call activity, time and location (cell ID) where the call activity started are recorded in the database. Call activity is any active use of a mobile phone (out-going calls and SMS/MMS messages, usage of Internet, GPRS; in the case of foreigners – also incoming calls). Each entry includes a random ID number for the phone. Visitors of a site are determined according to the model of anchor points.

**In this survey, a visitor** is a person who has been in the surveyed area, but neither his/her home nor work-time place (anchor point, i.e. cell ID) is located in the same area. The location of one's **home** is defined according to the mobile coverage area (cell) where call activities with the same phone in most of the days during the observation period are made after 5 pm. If there is not enough statistically confident information about one`s home, the location of home is marked as 'unknown'.

The location of one's **work place** is defined as the area (cell) where the call activities are made from 8 am until 5 pm. Anchor points of **spare time consist of** all the mobile phone coverage areas which are neither home nor work-time anchor points.

**Foreign tourists** in this survey are all people who used roaming service in Estonia. The data enables the presentation of the number of visits, not visitors. Their countries of origin are identified according to the states where their mobile phones have been registered.

## 3.3. Results

### 3.3.1. Number of visitors per day

According to the call activities in September 2016, **daily average number of visitors** in Paljassaare was **1323,** ranging from 746 to 1665, and in Kadriorg **3313**, ranging from 1977 to 5810 (Table 19). On average there were **1167 domestic and 156 foreign tourist**s daily in Paljassaare; **3200 domestic and 113 foreign tourists daily** in Kadriorg. During one month, 39 703 people visited Paljassaare and 99 384 visitors were in Kadriorg, but these numbers include visits by same people on different days in a month. If a person visited the site several times per day, s/he is counted once per day.

*Table 19. Visitor statistics by mobile positioning in Paljassaare Peninsula and Kadriorg Park area per day*

| | Paljassaare peninsula | | | Kadriorg park area | | |
|---|---|---|---|---|---|---|
| Date and day | Total number of visitors | Number of domestic tourists from all visitors | Number of foreign tourists from all visitors | Total number of visitors | Number of domestic tourists from all visitors | Number of foreign tourists from all visitors |
| 1.09.2016 Thu | **1509** | 1356 | 153 | **3705** | 3573 | 132 |
| 2.09.2016 Fri | **1629** | 1437 | 192 | **3948** | 3813 | 135 |
| 3.09.2016 Sat | **1003** | 831 | 172 | **2244** | 2097 | 147 |
| 4.09.2016 Sun | **817** | 687 | 130 | **2001** | 1884 | 117 |
| 5.09.2016 Mon | **1449** | 1311 | 138 | **3492** | 3378 | 114 |
| 6.09.2016 Tue | **1568** | 1431 | 137 | **3387** | 3300 | 87 |
| 7.09.2016 Wed | **1473** | 1332 | 141 | **3495** | 3381 | 114 |
| 8.09.2016 Thu | **1611** | 1443 | 168 | **3681** | 3561 | 120 |
| 9.09.2016 Fri | **1665** | 1443 | 222 | **3593** | 3456 | 137 |
| 10.09.2016 Sat | **913** | 819 | 94 | **2381** | 2277 | 104 |
| 11.09.2016 Sun | **828** | 690 | 138 | **2388** | 2268 | 120 |
| 12.09.2016 Mon | **1587** | 1431 | 156 | **3363** | 3264 | 99 |
| 13.09.2016 Tue | **1460** | 1320 | 140 | **3698** | 3579 | 119 |
| 14.09.2016 Wed | **1347** | 1203 | 144 | **3449** | 3336 | 113 |
| 15.09.2016 Thu | **1527** | 1383 | 144 | **5810** | 5666 | 144 |
| 16.09.2016 Fri | **1511** | 1314 | 197 | **3864** | 3690 | 174 |
| 17.09.2016 Sat | **849** | 681 | 168 | **2445** | 2316 | 129 |
| 18.09.2016 Sun | **821** | 690 | 131 | **1977** | 1857 | 120 |
| 19.09.2016 Mon | **1490** | 1332 | 158 | **3375** | 3309 | 66 |
| 20.09.2016 Tue | **1637** | 1443 | 194 | **3692** | 3615 | 77 |
| 21.09.2016 Wed | **1526** | 1365 | 161 | **3516** | 3441 | 75 |
| 22.09.2016 Thu | **1475** | 1278 | 197 | **3420** | 3303 | 117 |
| 23.09.2016 Fri | **1487** | 1296 | 191 | **3777** | 3654 | 123 |
| 24.09.2016 Sat | **750** | 588 | 162 | **2475** | 2352 | 123 |
| 25.09.2016 Sun | **746** | 651 | 95 | **2118** | 2013 | 105 |
| 26.09.2016 Mon | **1464** | 1317 | 147 | **3984** | 3912 | 72 |
| 27.09.2016 Tue | **1560** | 1413 | 147 | **3576** | 3495 | 81 |
| 28.09.2016 Wed | **1337** | 1233 | 104 | **3720** | 3639 | 81 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 29.09.2016 Thu | **1365** | 1227 | 138 | **3162** | 3054 | 108 |
| 30.09.2016 Fri | **1299** | 1077 | 222 | **3648** | 3504 | 144 |
| **Average per day** | **1323 (100%)** | **1167 (88%)** | **156 (12%)** | **3313 (100%)** | **3200 (97%)** | **113 (3%)** |

It has to be noted that these visitor numbers refer to the visitors in Paljassaare peninsula and Kadriorg area, not exactly in Paljassaare green area and Kadriorg Park (Figure 41). However, the green area visitors should make up the majority of all visitors in these areas. Other visitors identified by mobile positioning data are also those who stayed in the residential and industrial region of Paljassaare or in the residential and commercial region next to Kadriorg Park, since the areas defined by mobile antennas are multifunctional and extend over Paljassaare and Kadriorg recreational areas.

By comparing the number of visitors based on electronic counting in "Paljassaare tee" and mobile positioning in Paljassaare peninsula, a considerable difference can be noticed (Table 20).

*Table 20. Comparison of visitor data by electronic counting and mobile positioning in Paljassaare*

| Date and time | Number of visitors by electronic counting in Paljassaare tee (in/out) | Number of visitors by mobile positioning data in Paljassaare peninsula |
|---|---|---|
| 1.09.2016 Thu | 43/68 | 1509 |
| 2.09.2016 Fri | 125/115 | 1629 |
| 3.09.2016 Sat | 31/36 | 1003 |
| 4.09.2016 Sun | 88/105 | 817 |
| 5.09.2016 Mon | 60/59 | 1449 |
| 6.09.2016 Tue | 49/67 | 1568 |
| 7.09.2016 Wed | 30/39 | 1473 |
| 8.09.2016 Thu | 41/53 | 1611 |
| 9.09.2016 Fri | 35/61 | 1665 |
| 10.09.2016 Sat | 62/102 | 913 |
| 11.09.2016 Sun | 112/134 | 828 |
| 12.09.2016 Mon | 52/68 | 1587 |
| 13.09.2016 Tue | 49/61 | 1460 |
| 14.09.2016 Wed | 47/71 | 1347 |
| 15.09.2016 Thu | 29/26 | 1527 |
| 16.09.2016 Fri | 24/31 | 1511 |

| | | |
|---|---|---|
| 17.09.2016 Sat | 61/82 | 849 |
| 18.09.2016 Sun | 83/112 | 821 |
| 19.09.2016 Mon | 30/34 | 1490 |
| 20.09.2016 Tue | 39/44 | 1637 |
| 21.09.2016 Wed | 47/60 | 1526 |
| 22.09.2016 Thu | 16/13 | 1475 |
| 23.09.2016 Fri | 22/31 | 1487 |
| 24.09.2016 Sat | 57/51 | 750 |
| 25.09.2016 Sun | 97/134 | 746 |
| 26.09.2016 Mon | 37/48 | 1464 |
| 27.09.2016 Tue | 37/51 | 1560 |
| 28.09.2016 Wed | 18/19 | 1337 |
| 29.09.2016 Thu | 45/23 | 1365 |
| 30.09.2016 Fri | 25/12 | 1299 |
| **Average per weekend** | **77,6/94,5** | **841** |
| **Average per working day** | **40,9/47,9** | **1499** |

There is a significant disparity between the amount of Paljassaare visitors on weekends and working days by mobile positioning method: the number of weekend visitors is only about half of the visitors on working days (Figure 42). Electronically more visitors were counted in weekends as well as in the on-site interviews, the majority of respondents preferred weekend as a visiting time to Paljassaare.

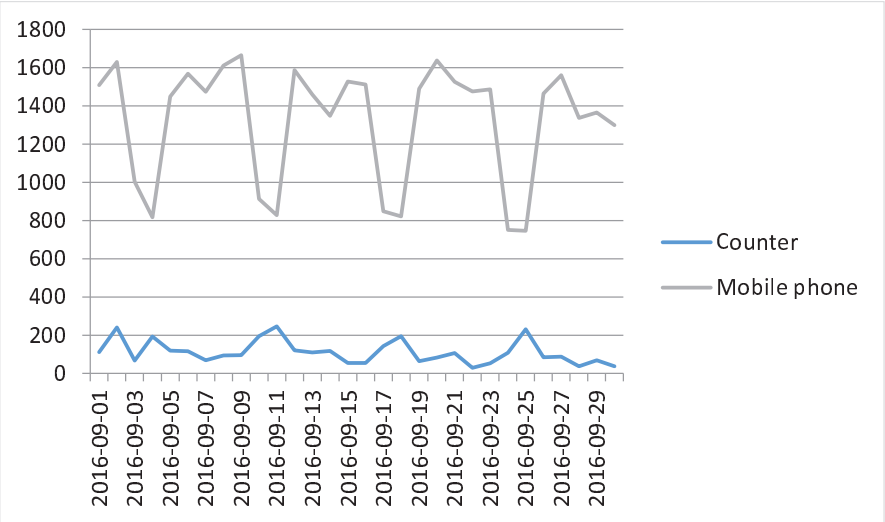


*Figure 42. Comparison of visitor data by electronic counting and mobile positioning in Paljassaare, 1.09.-30.09.2016*

It can be assumed that on working days there are more visitors in Paljassaare who go to the nearby waste water treatment plant, fish industry or harbour; and therefore the number of weekend visitors should be more accurate for the Paljassaare green area visitors. The **average daily number** of visitors in Paljassaare **during September weekends was 841**, split between 705 (84%) domestic tourists and 136 (16%) foreign tourists. However, this number is still considerably higher than the average number of visitors counted electronically per day in September weekend (86), but it may include those mobile users who were only staying on Katariina quay or on Pikakari beach (e.g. fishermen, joggers, autumn sunbathers) and did not enter the Bird Conservation Area where the electronic counting took place.

In Kadriorg, the **average daily number** of visitors **during September weekends was 2254**, split between 2133 (95%) domestic tourists and 121 (6%) foreign tourists.

### 3.3.2. Origin of visitors

The most frequent **country of origin of foreign tourists** in September 2016 in both Paljassaare and Kadriorg was Finland, respectively 2472 (68%) and 1440 (62%) of all foreign tourists (Figure 43). In Paljassaare, Finland was followed by Latvia (8%), Sweden (6%), Lithuania (4%), Russia and Norway (both 2%). In Kadriorg, the rest of the more frequent countries were Latvia (6%), Sweden (5%), Great Britain (4%), Lithuania and Russia (both 3%).

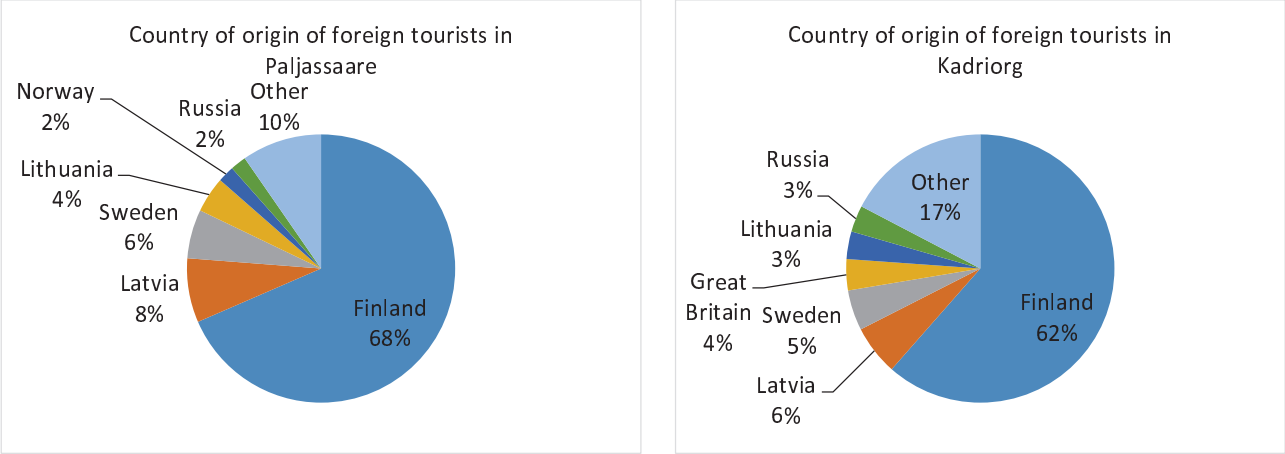


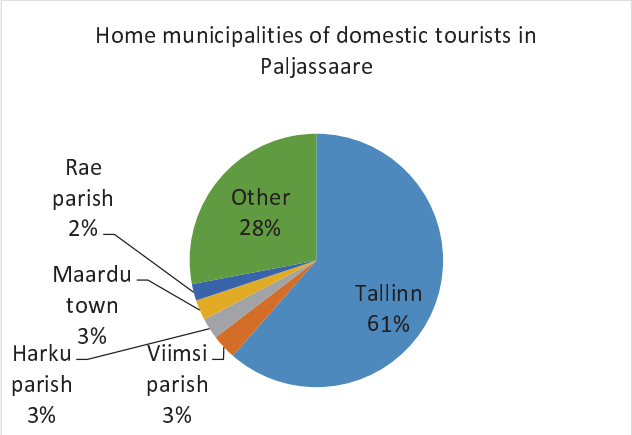

*Figure 43. Country of origin of foreign tourists in Paljassaare and Kadriorg, September 2016*

All countries where the foreign tourists came from are shown in Figure 44 and Figure 45.

*Figure 44. Origin of foreign tourists who visited Paljassaare in September 2016*

*Figure 45. Origin of foreign tourists who visited Kadriorg in September 2016*

**Of domestic tourists** 61% in Paljassaare and 69% in Kadriorg were from Tallinn (Figure 46). Tallinn, as a place of origin, was followed by its neighbouring municipalities: in Paljassaare, this was Viimsi, Harku and Maardu (all 3%) and Rae (2%); in Kadriorg, this was Maardu, Viimsi and Rae (all 4%) and Jõelähtme parish (2%).



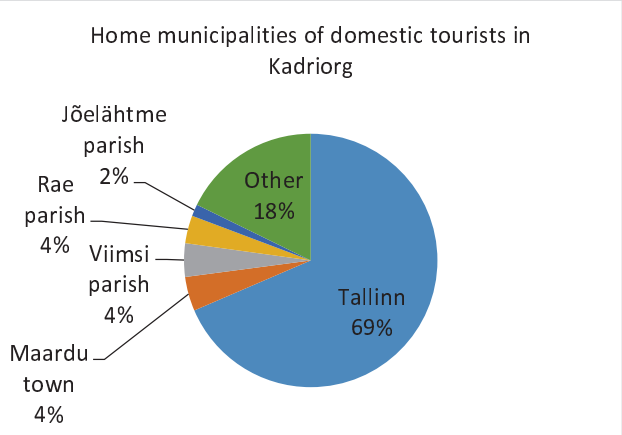




*Figure 46. Home municipalities of domestic tourists in Paljassaare and Kadriorg, September 2016*

All home municipalities of domestic tourists are shown in Figure 47 and Figure 48.

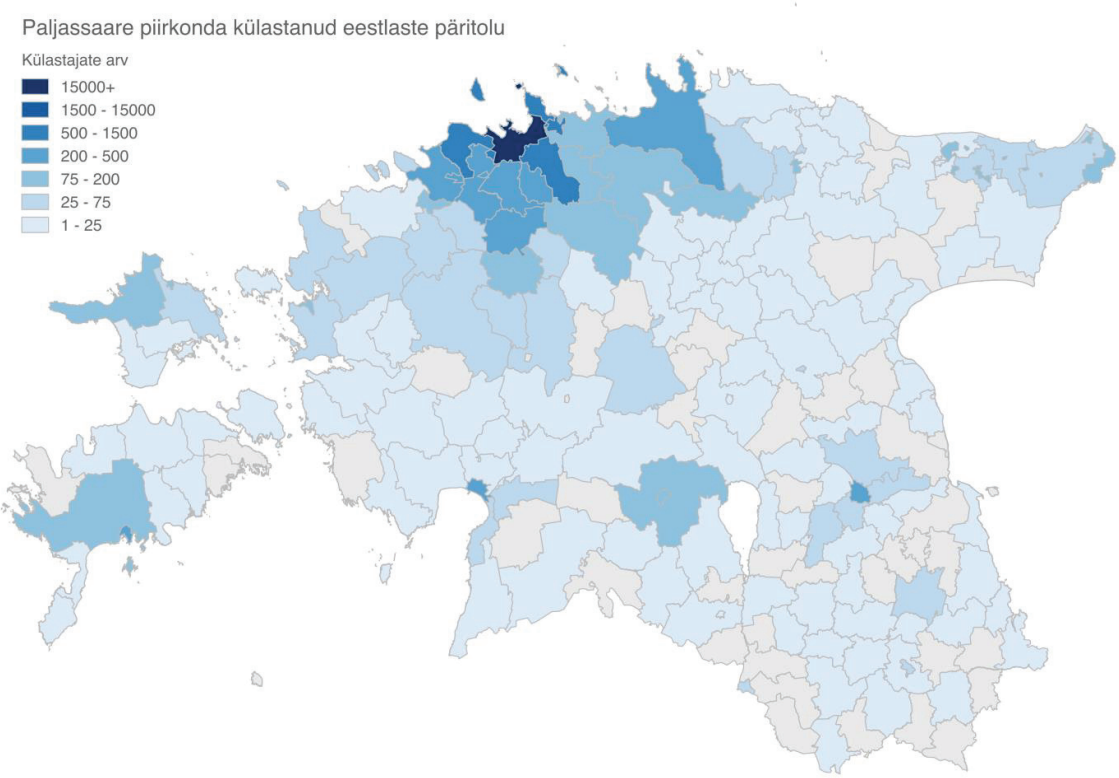



*Figure 47. Home municipalities of domestic tourists in Paljassaare in September 2016.*

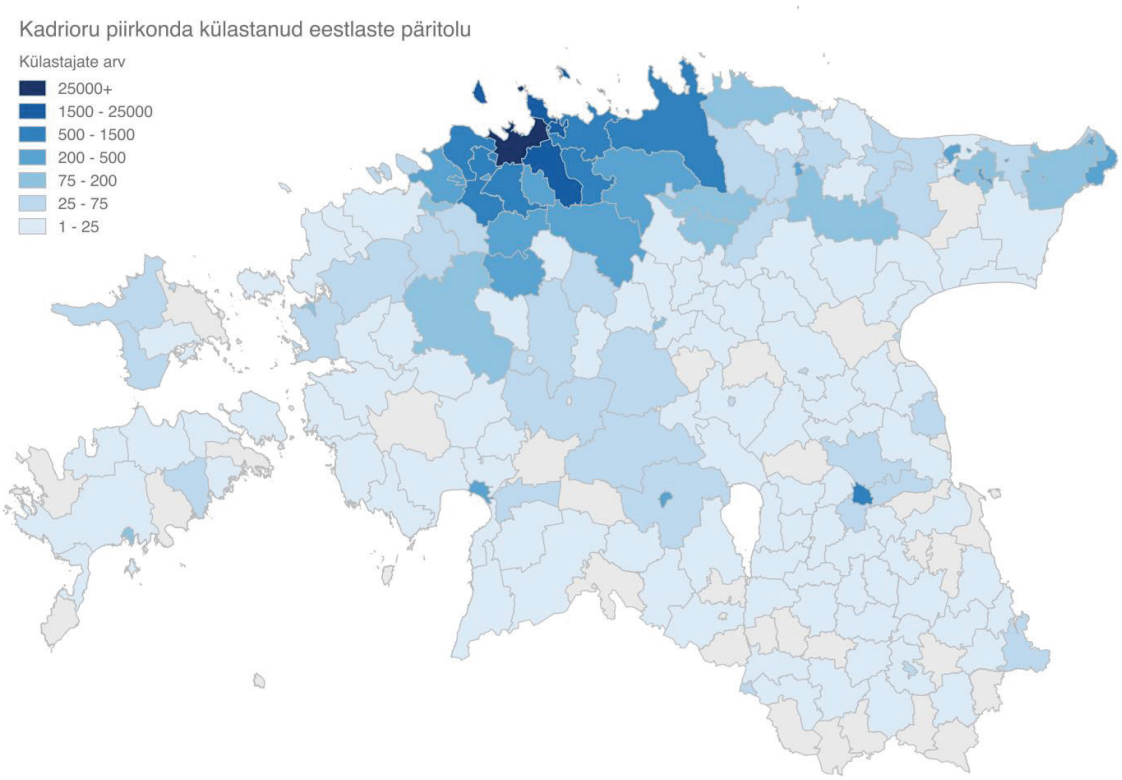



*Figure 48. Home municipalities of domestic tourists in Kadriorg in September 2016.*

If the origin of interviewees (as stated by the respondents) and mobile phone users are compared by dates, a few cases of non-correspondence can be identified. On 18.09.2016 a visitor from Vasalemma parish and on 24.09.2016 a visitor from Anija parish were interviewed in Kadriorg. On 26.09.2016 a visitor from Viljandi was interviewed in Paljassaare. The mobile positioning database does not include call activities from these municipalities on the respective dates. This is possible if those interviewees did not perform mobile phone call activities (out-going calls, SMS/MMS messages, usage of Internet or GPRS) during their visits to the green areas or if they had changed their place of residence lately.

### 3.3.3. Foreign tourists

Based on the mobile positioning data, foreign tourists in Paljassaare and Kadriorg can be described according to the duration of their visits in Estonia (one day and multi-day visits), existence of previous visits to the area and to Estonia (first-time and repeat-visitors) and based on other municipalities visited in Estonia by them.

**The duration of a visit** is calculated according to the number of days during the travel when call activities in a defined area were made. For example, if a visitor in Paljassaare/Kadriorg made a call activity only on one day in Estonia during September 2016, s/he has made a one-day visit to Estonia. If a visitor in Paljassaare/Kadriorg performed a call activity on one day and the next call activity on another day in Estonia in less than seven days, s/he has paid a two-day visit to Estonia (i.e. multi-day visitor).

If the time period between two call activities in Estonia from the same mobile phone was seven or more days, the mobile phone owner supposedly left the country in the meantime, and both visits are counted separately. Table 21 shows the number of one-day and multi-day visitors in Estonia who also visited Paljassaare/Kadriorg. The table includes the top 10 countries from where most of the tourists had come. In Kadriorg, there were more foreign tourists who stayed in Estonia for at least two days. In Paljassaare, the trend was opposite, except in the cases of Finnish, Latvian and Polish tourists. One explanation for the relatively large amount of day-trip visitors there can be cruise and other ships passing by Paljassaare.

*Table 21. Number of one-day and multi-day visitors in Estonia who visited Paljassaare and Kadriorg in September 2016*

| Visitors in Paljassaare Peninsula | | | | Visitors in Kadriorg Park area | | | |
|---|---|---|---|---|---|---|---|
| **Country of origin** | Number of one-day visitors to Estonia | **Country of origin** | Number of multi-day visitors to Estonia | **Country of origin** | Number of one-day visitors to Estonia | **Country of origin** | Number of multi-day visitors to Estonia |
| **FI** | 804 | **FI** | 1962 | **FI** | 273 | **FI** | 1155 |
| **SE** | 147 | **LV** | 186 | **SE** | 51 | **LV** | 111 |
| **LV** | 138 | **LT** | 120 | **LV** | 42 | **GB** | 69 |
| **LT** | 87 | **SE** | 69 | **DE** | 42 | **LT** | 69 |
| **DE** | 48 | **PL** | 39 | **RU** | 24 | **RU** | 57 |
| **RU** | 42 | **RU** | 30 | **GB** | 15 | **SE** | 54 |
| **NO** | 39 | **NO** | 28 | **PL** | 15 | **FR** | 45 |
| **US** | 36 | **GB** | 21 | **NO** | 14 | **NO** | 31 |
| **GB** | 27 | **DE** | 12 | **US** | 12 | **IT** | 24 |
| **PL** | 18 | **NL** | 12 | **FR** | 12 | **US** | 24 |
| **Other countries** | 75 | **Other countries** | 82 | **Other countries** | 48 | **Other countries** | 133 |

**A repeat-visit** is a visit by a tourist who has been in the same area/Estonia during the previous 10 years before September 2016. The majority of all foreign tourists from the 10 most frequent countries during the period under consideration were first-time visitors to Paljassaare, but not to the more well-known Kadriorg (Table 22, Table 23).

In the case the number of people visiting is less than 10, it is shown as '<10' in the table for the purpose of maintaining privacy. The data enables the calculation of the number of different (i.e. unique) foreign tourists per month. In Kadriorg, contrary to expectations, there were fewer tourists from abroad (at least 2350) than in Paljassaare (at least 3617) in September 2016. Again, this can be explained by tourist ships passing by Paljassaare.

*Table 22. Number of first and repeat-time visitors per month in Paljassaare, September 2016*

| Paljassaare Peninsula | | | | | |
|---|---|---|---|---|---|
| **Country of origin** | First-time visitors to Paljassaare | Repeat-visitors to Paljassaare | Number of foreign tourists per month | First-time visitors to Estonia | Repeat-visitors to Estonia |
| **FI** | 1467 | 1005 | **2472** | 456 | 2016 |
| **LV** | 156 | 123 | **279** | 60 | 219 |
| **SE** | 201 | 12 | **213** | 114 | 99 |
| **LT** | 90 | 66 | **156** | 30 | 126 |
| **NO** | 58 | 14 | **72** | 47 | 25 |
| **RU** | 48 | 21 | **69** | 36 | 33 |
| **DE** | 57 | 0 | **57** | 54 | <10 |
| **PL** | 39 | <10 | **48** | 18 | 30 |
| **GB** | 45 | <10 | **⩾46** | 42 | <10 |
| **US** | 45 | 0 | **45** | 42 | <10 |
| **Other countries** | 135 | 25 | **160** | 117 | 43 |
| **Total per month** | **3617** | | | | |

*Table 23. Number of first and repeat-time visitors per month in Kadriorg, September 2016*

| Kadriorg Park area | | | | | |
|---|---|---|---|---|---|
| **Country of origin** | First-time visitors to Kadriorg | Repeat-visitors to Kadriorg | Number of foreign tourists per month | First-time visitors to Estonia | Repeat-visitors to Estonia |
| **FI** | 840 | 600 | **1440** | 414 | 1026 |
| **LV** | 96 | 45 | **141** | 18 | 123 |
| **SE** | 102 | 12 | **114** | 36 | 78 |
| **GB** | 87 | <10 | 96 | 60 | 36 |
| **LT** | 45 | 33 | **78** | 21 | 57 |
| **RU** | 54 | 21 | **75** | 21 | 54 |
| **DE** | 63 | 0 | **63** | 45 | 18 |
| **FR** | 57 | 0 | **57** | 51 | <10 |
| **NO** | 33 | 11 | **44** | 19 | 25 |
| **US** | 30 | <10 | **⩾31** | 24 | <10 |
| **Other countries** | 187 | 24 | **211** | 160 | 51 |
| **Total per month** | **2350** | | | | |

**Other visited municipalities** in Estonia during September 2016 by foreign tourists who stayed in Paljassaare and Kadriorg are shown in Table 24. The municipalities mostly indicate to the routes Tallinn-Pärnu, Tallinn-Tartu, Tallinn-Rakvere. An exception is Viimsi parish which may refer to ship routes in Tallinn Bay used by Finnish and Swedish tourists (Figure 49 and Figure 50).

*Table 24. Other municipalities visited in Estonia by foreign tourists who stayed in Paljassaare and Kadriorg in September 2016*

| Paljassaare Peninsula | | Kadriorg Park area | |
|---|---|---|---|
| **Municipality** | **Number of visits** | **Municipality** | **Number of visits** |
| **Tallinn town** | 3619 | **Tallinn town** | 2353 |
| **Viimsi parish** | 1472 | **Viimsi parish** | 732 |
| **Harku parish** | 569 | **Rae parish** | 327 |
| **Rae parish** | 512 | **Maardu town** | 305 |
| **Saue parish** | 473 | **Jõelähtme parish** | 294 |
| **Pärnu town** | 396 | **Harku parish** | 264 |
| **Saku parish** | 365 | **Kuusalu parish** | 249 |
| **Märjamaa parish** | 327 | **Saku parish** | 216 |
| **Tartu town** | 309 | **Saue parish** | 213 |
| **Maardu town** | 258 | **Pärnu town** | 207 |

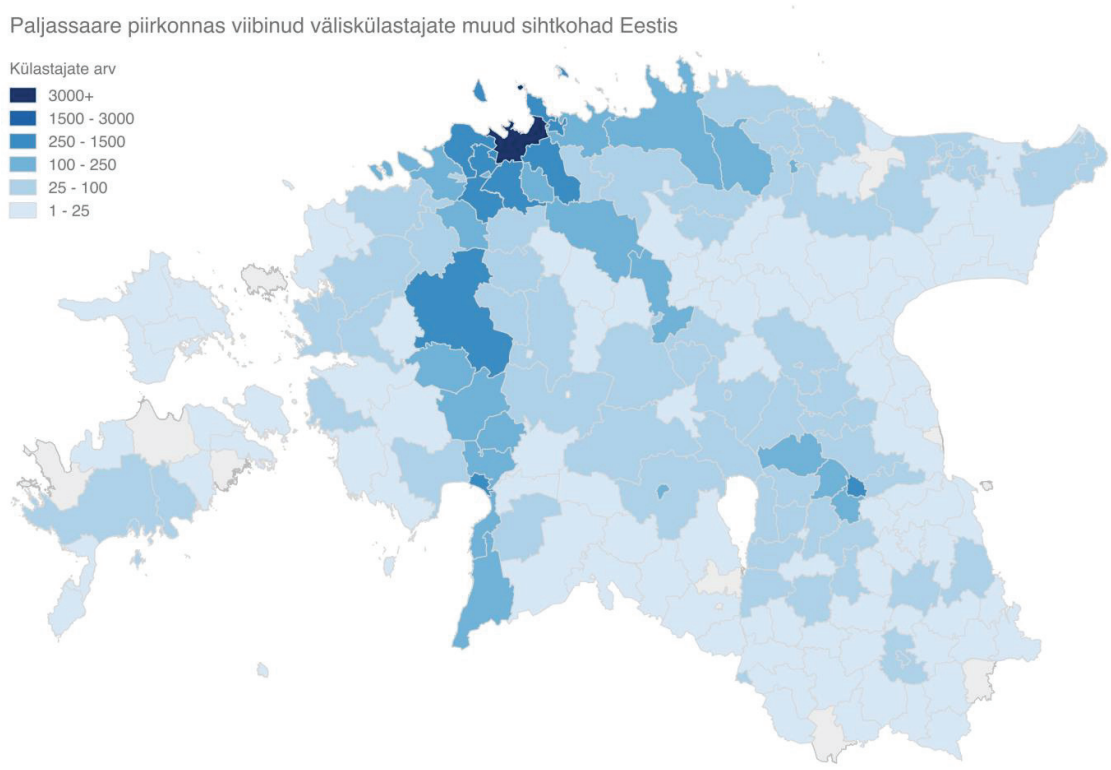



*Figure 49. Other municipalities visited in Estonia by foreign tourists who stayed in Paljassaare in September 2016.*

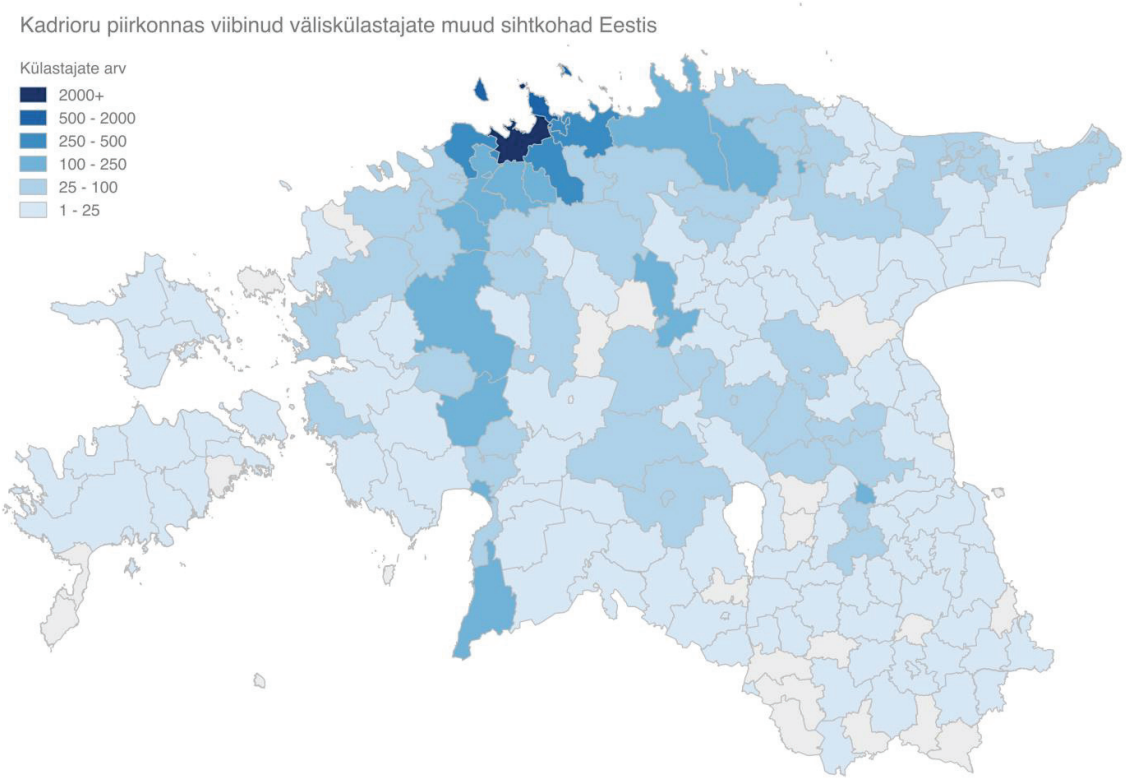



*Figure 50. Other municipalities visited in Estonia by foreign tourists who stayed in Kadriorg in September 2016.*

The mobile positioning survey will be repeated in May 2017, September 2017 and May 2018 to analyse seasonal and yearly changes in visitor numbers via mobile positioning data.

# 4. Conclusions

The visitor surveys provide baseline information on visitors of five green areas in Tallinn and Helsinki during the autumn of 2016.

1. In particular, **on-site interviews** were used to describe the visitors' general profile, their motives to visit the green areas, their temporal and spatial use of the green areas and their current preferences, satisfaction and expectations in relation to nature information services, infrastructure and management at the sites. In addition to these human-provided services, investments and actions, we also explored the respondents' opinions on the activities and benefits enabled by ecosystem services in urban green areas.

   The baseline data support the need for providing more nature information and possibilities for contact with nature in urban green areas which is also one of the aims of NATTOURS project.

   Based on the responses, the users who are more likely to visit these green areas frequently were identified. In order to better understand the motives and preferences of other user groups, e.g. tourists, it would be worthwhile to increase the survey sample size for the next on-site interviews to be conducted in May 2018. For achieving this aim, the questionnaire can be slightly shortened. Also, some adjustments in questions are needed to simplify answering the questions.

2. **Electronic counting** provided information on hourly, daily, weekly and monthly flow of visitors and their movement direction in Paljassaare Bird Conservation Area. Although some time periods reflected counting numbers which were too low or too high compared to the average, these deviations should be possible to eliminate in data analysis. It is necessary to continue with the collection of electronic visitor statistics.

3. **The mobile positioning** study provides more information related to different aspects of visitors than electronic counting, but the degree of precision of the visitor numbers in a specific area is lower. The mobile positioning data indicates the number of visitors (i.e. mobile phone users) per day in Paljassaare and Kadriorg and their origin (country abroad and municipality in Estonia). Secondly, in the case of foreign tourists, it is possible to differentiate between the day-trip and multi-day tourists in Estonia as well as between first-time and repeat-visitors. Thirdly, the call activities performed by foreign tourists showed which other places (municipalities) they visited in Estonia.

   In the next stages of the mobile positioning study, exploring further possibilities to improve the precision of visitor statistics based on mobile phone data is necessary. The aim is to increase the data credibility and evaluate the applicability of mobile positioning method in urban green areas. The green areas in the present

study are relatively small and not separated from surrounding areas which have strong impact to them through large coverage of neighbouring mobile antennas.

The baseline visitor data gathered in 2016 will be compared with respective new data in 2018.

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# Annex. Interview questionnaire

International project NATTOURS is conducting visitor survey in */name of the site/* with the aim to better understand the motivation for visiting the site and the role of nature in it, as well as visitors' preferences and satisfaction with the site, in order to manage urban green areas in line with visitors' expectations. We will be very grateful if you agree to answer the following questions.

I General questions about yourself

1. **From where did you come to the site?** If from ...../district of the site/ district, write the street name, otherwise city district:
   .....

   **How long did it take to come here?** ..... hours, .... minutes.

2. **Your place of residence** (city district if capital region; city/municipality if Estonia/Finland; international visitors: country of residence)

   .....

II Questions about this visit

3. **How did you come to the site? The main travelling mode**

| | | Mark (X) |
|---|---|---|
| 1 | On foot | |
| 2 | By bike | |
| 3 | By motorbike | |
| 4 | By public transport | |
| 5 | By organised bus | |
| 6 | By car | |
| 7 | Other (what?) | |

4. **With whom are you visiting the site today? Multi-choice response**

| | | Mark (X) and the number of people visiting the site together |
|---|---|---|
| 1 | Alone | |
| 2 | With family / family member / relative(s) | |
| 3 | With friend(s) | |
| 4 | With colleagues | |
| 5 | With an organised group | |
| 6 | With someone else (who?) | |

5. **Why did you come here? The main motive(s): (multi-choice response)**

| | | Mark (X) |
|---|---|---|
| 1 | To walk/rest in nature | |
| 2 | To walk the dog/cat | |
| 3 | To picnic/eat outdoors | |

| | | |
|---|---|---|
| 4 | To hike | |
| 5 | To bike | |
| 6 | To sport/jog/rollerskate | |
| 7 | To go to the beach/sunbathe | |
| 8 | To watch birds | |
| 9 | To meet other people with the same interests | |
| 10 | To take care of my health and well-being | |
| 11 | To work | |
| 12 | To study | |
| 13 | Daily commuting to work, home, shopping etc | |
| 14 | To play with child(ren) | |
| 15 | To take photos | |
| 16 | To pick berries/herbs/mushrooms | |
| 17 | To fish | |
| 18 | Other (what?) | |

**6. How did you know to come here? Multi-choice response**

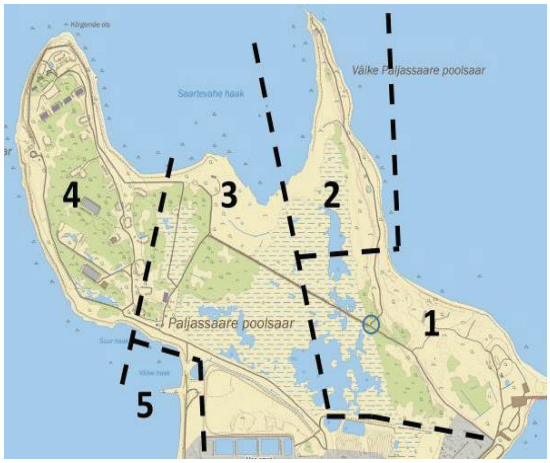
| | | Mark (X) |
|---|---|---|
| 1 | I received information on the site's nature from friends / relatives / colleagues | |
| 2 | I received information on the site's nature from media / books | |
| 3 | I received information on the site's nature from Internet | |
| 4 | I came here by chance | |
| 5 | I know the site's nature for a long time already / from my childhood | |
| 6 | Other sources (which?) | |

**7. How long do you plan to stay at the site today?**

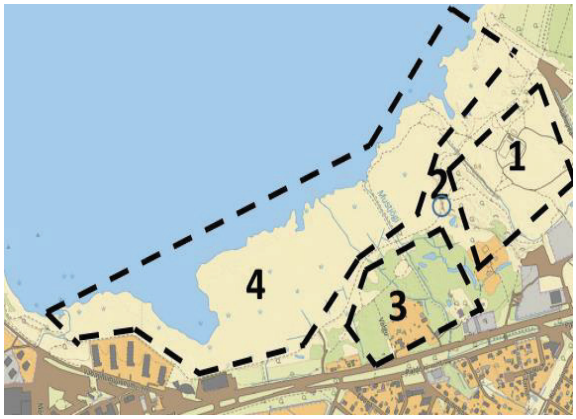
| | | Mark (X) |
|---|---|---|
| 1 | Less than an hour | |
| 2 | 1...2 hours | |
| 3 | 2...5 hours | |
| 4 | More than 5 hours | |

**8. Which places do you plan to visit / have you visited at the site today? See the map below.**

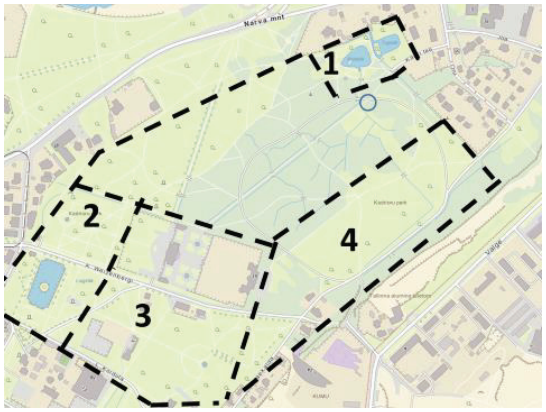
| | **Paljassaare:** | Mark (X) |
|---|---|---|
| 1 | Surroundings of parking lot and reed bed tower | |
| 2 | Väike-Paljassaare | |
| 3 | Saartevahe | |
| 4 | Suur-Paljassaare | |
| 5 | Surroundings of Paljassaare Bay | |




| | Rocca al Mare: | Mark (X) |
|---|---|---|
| 1 | Wasteland, meadow | |
| 2 | Promenade | |
| 3 | Mustjõe forest | |
| 4 | Reed bed | |




| | Kadriorg Park: | Mark (X) |
|---|---|---|
| 1 | Japanese garden | |
| 2 | Central part | |
| 3 | Eastern part | |
| 4 | Surroundings of museums and palace | |
| 5 | Surroundings of the Swan Pond | |




| | Pornaistenniemi-Lammassaari: | Mark (X) |
|---|---|---|
| 1 | Pornaistenniemi | |
| 2 | Lammassaari | |
| 3 | Kuusiluoto | |
| 4 | Hakalanniemi | |
| 5 | Purolahti/Mölylä | |

| | Harakka Island: | Mark (X) |
|---|---|---|
| 1 | Northern part | |
| 2 | Southern part | |
| 3 | Kuusiluoto | |
| 4 | Hakalanniemi | |
| 5 | Purolahti/Mölylä | |

III Questions about your previous visits to */name of the site/*

**9. For how many years have you visited this site?**

| | | Mark (X) |
|---|---|---|
| 1 | I am here for the first time | |
| 2 | Only this year | |
| 3 | 2...3 years | |
| 4 | 4...5 years | |
| 5 | 6...10 years | |
| 6 | More than 10 years | |

**10. How often do you visit the site?**

| | | Mark (X) |
|---|---|---|
| 1 | Almost every day | |
| 2 | At least once a week | |
| 3 | At least once a month | |
| 4 | At least once a year | |
| 5 | More seldom | |

**11. When do you usually visit the site? Multi-choice response**

| | | Mark (X) |
|---|---|---|
| 1 | On working days | |
| 2 | On weekend | |
| 3 | On holiday | |

**12. In which season do you visit the site most of all?**

| | | Mark (X) |
|---|---|---|
| 1 | All the year round | |
| 2 | In spring | |
| 3 | In summer | |
| 4 | In autumn | |
| 5 | In winter | |

**13. What has been the most common reason for your visit to the site? Choose up to 3 reasons.**

| | | Mark (X) |
|---|---|---|
| 1 | Walking/resting in nature | |
| 2 | Walking with the dog/cat | |
| 3 | Picnic/eating outdoors | |
| 4 | Hiking | |
| 5 | Biking | |
| 6 | Sporting/jogging/roller-skating | |
| 7 | Going to the beach/sunbathing | |
| 8 | Birdwatching | |
| 9 | Meeting other people with the same interests | |
| 10 | Taking care of my health and well-being | |
| 11 | Working | |
| 12 | Studying | |
| 13 | Going to work, home, shopping etc. in relation with everyday activity | |
| 14 | Playing with child(ren) | |

| | | |
|---|---|---|
| 15 | Taking photos | |
| 16 | Picking berries/herbs/mushrooms | |
| 17 | Fishing | |
| 18 | Other (what?) | |

## IV Nature in */name of the site/*: preferences, expectations and satisfaction

**14. What kind of nature education/information services do you need at the site? Multi-choice response**

| | | Mark (X) |
|---|---|---|
| 1 | Designated hiking/walking trails | |
| 2 | Nature study trail with detailed information on landscape and wildlife | |
| 3 | Information about nature's effects on human well-being | |
| 4 | Map with trails | |
| 5 | Guided nature tours | |
| 6 | Nature visitor centre | |
| 7 | Information about the site and its nature on the Internet | |
| 8 | Mobile applications on the site's nature | |
| 9 | Nothing needs to be changed | |
| 10 | Other (what?) | |

**15. How do you evaluate the quality of nature education/information infrastructure at the site? Mark (X) on a 1–5 points measurement scale.**

| | | Very good 5 | Good 4 | Satis-factory 3 | Poor 2 | Very poor 1 | Haven`t used them |
|---|---|---|---|---|---|---|---|
| 1 | Walking trails/paths | | | | | | |
| 2 | Information boards | | | | | | |
| 3 | Birdwatching towers | | | | | | |
| 4 | Benches for enjoying nature | | | | | | |

**16. How do you evaluate the nature management of the site and access to the site? Mark (X) on a 1–5 points measurement scale.**

| | | Very good 5 | Good 4 | Satis-factory 3 | Poor 2 | Very poor 1 | Don`t know |
|---|---|---|---|---|---|---|---|
| 1 | Level of nature protection | | | | | | |
| 2 | Cleanliness/maintenance | | | | | | |
| 3 | Attractiveness | | | | | | |
| 4 | Availability of information on the sites' nature | | | | | | |
| 5 | Safety of the site | | | | | | |
| 6 | Access to the site | | | | | | |

17. **How do you characterise the natural area within the site? Mark (X)**

| | | | | |
|---|---|---|---|---|
| 1 | Size | Sufficient | Too small | Too big |
| 2 | Appearance | Natural enough | Too wild | Too urban |
| 3 | Amount of visitors | Reasonable | Too few | Too many |
| 4 | Development | Developed enough | Developed too little | Developed too much |

Comments:

.....

18. **How important is it for you to have a possibility of doing the following in urban green areas and how satisfied are you with them at this site now? Please answer to all options. Mark (X) on a 1–5 points measurement scale.**

| | | Importance for you in general | | | | | Satisfaction on this site | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Very important 5 | Important 4 | Moderately important 3 | Not very important 2 | Not at all 1 | Very satisfied 5 | Satisfied 4 | Slightly satisfied 3 | Slightly unsatisfied 2 | Not at all satisfied 1 |
| 1 | Spend free time / relax | | | | | | | | | | |
| 2 | Enjoy nature views | | | | | | | | | | |
| 3 | Learn about nature | | | | | | | | | | |
| 4 | Listen to nature sounds | | | | | | | | | | |
| 5 | Watch birds, butterflies and other wildlife | | | | | | | | | | |
| 6 | Pick berries/ herbs/mushrooms | | | | | | | | | | |
| 7 | Do sports/exercise | | | | | | | | | | |
| 8 | Go for hobbies (photographing, drawing etc) | | | | | | | | | | |
| 9 | Breathe fresh air | | | | | | | | | | |
| 10 | Be in tranquillity, away from urban environment and noise | | | | | | | | | | |
| 11 | Get shade on hot summer days | | | | | | | | | | |
| 12 | Other (what?): | | | | | | | | | | |

19. **In your opinion, how important are the following social and cultural benefits for the city provided by the site's nature? Please answer to all options. Mark (X) on a 1–5 points measurement scale.**

| | | Very important 5 | Important 4 | Mode-rately important 3 | Not very important 2 | Not at all important 1 |
|---|---|---|---|---|---|---|
| 1 | Improved mental and physical public health from spending time at the site | | | | | |
| 2 | Attractive neighbourhood for living | | | | | |
| 3 | Tourism | | | | | |
| 4 | Environmental education | | | | | |
| 5 | Cultural activities | | | | | |
| 6 | Aesthetical appreciation and inspiration | | | | | |

V Concluding questions

**20. Your age:**

.....

**21. Your nationality:**

.....

**22. Your gender:**

| | | Mark (X) |
|---|---|---|
| 1 | Male | |
| 2 | Female | |

**Thank you!**

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Filled in by the interviewer:

Date of the interview:..... Time of the interview: .....