

Nature-wise Espoo

Roadmap towards no net loss of biodiversity



Luontoviisas Espoo

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Foreword

Nature is an important part of Espoo and the attractiveness of our city. Many of the gems of the nature of the Helsinki Metropolitan Area are located in Espoo, and the city also boasts several valuable natural sites that represent a wide range of habitats. Forests, numerous running waters and lakes, and the sea are some of the best features of the nature in Espoo.

Biodiversity supports the health and well-being of local residents by, for example, improving their resistance and encouraging them to be physically active. Residents especially appreciate how verdant and nature-oriented Espoo is.

Our goal is to develop Espoo so that biodiversity is preserved and improved as the city grows. We want to be a pioneer in introducing new measures and developing practices for securing biodiversity. Our long-term work will proceed gradually. It will require commitment and new kind of cooperation.

The roadmap is a compilation of development needs and the measures which we at the City of Espoo use to promote biodiversity in the urban environment. In order to achieve our goals, we also need residents, companies and communities. Through the roadmap, we encourage the entire Espoo community to take action for biodiversity.

We have been working for biodiversity for a long time. Let's find new and better ways to nurture our precious nature together!

Olli Isotalo

Director of Urban Environment



Summary:

Nature-wisely towards the future

Espoo's unique nature is a diverse and vital part of the lives of city residents. Changes in land use affect habitats, and loss of biodiversity must be prevented at a local level while the city grows. The Nature-wise Espoo roadmap guides Espoo's development in a manner that supports biodiversity. Its goal is to avoid and mitigate adverse effects on nature, as well as to increase biodiversity throughout Espoo. The roadmap describes the measures and development needs that will help us achieve these goals. This means actions such as preserving habitats, protecting endangered species and creating new habitats. Special attention is paid to ecological networks, forests, water bodies and marine areas, as well as urban nature.

The roadmap is based on the identification of the special characteristics and values of Espoo's nature as well as previous nature work. It utilises best practices and presents new ideas such as nature-based solutions and ecological compensation. Alongside natural conservation, the roadmap raises the issue of restoring natural sites. Achieving the goals requires cooperation and active production, acquisition and sharing of data. Nature data are effectively utilised in the city's own work, and Nature-wise Espoo encourages all Espoo residents to act for the benefit of biodiversity. The roadmap presents ways to increase nature data, promote cooperation and improve communications.

The implementation and establishment of Nature-wise Espoo is a long-term process that requires resources and continuous monitoring. Various tools, such as the classification criteria of Espoo's nature values, can be utilised in promoting nature work. Both the state of nature and the progress of roadmap work are monitored with current and new indicators, some of which can also be compared nationally and internationally.

Espoo aims to achieve urban development that safeguards and revitalises biodiversity. We strive for no net loss of biodiversity, i.e. stopping the loss of biodiversity by 2035. These goals are linked to the strategy of the City of Espoo, as well as international commitments and national legislation. The roadmap has been prepared in extensive cooperation in the Urban Environment Sector, and it encourages the entire Espoo community to act for the benefit of biodiversity.

Glossary

Ecological compensation refers to compensating for the loss of biodiversity in a particular location by increasing biodiversity in another location by, for example, protecting or restoring a degraded nature site.

The ecological network consists of the core areas of nature and the ecological connections between them.

The connectivity of the ecological network enables the natural movement of species between feeding and breeding areas, as well as the species spreading to new areas. Connectivity is higher in cohesive, natural habitats than in isolated ones. Connectivity is functional and structural. In functional connectivity, the movement of the species between habitats is possible when the distance between the areas, as well as the mobility and perception of the species, are taken into account. A structurally connected living environment is not interrupted by large obstacles such as roads.

Ecological links are stretches of nature between nature areas and green areas, along which species can move between areas.

An ecosystem is a natural system located in a specific location that consists of animate and inanimate nature and the processes that affect them.

An ecosystem service, or, **nature benefit** is a tangible or intangible benefit that the structure and

functioning of the ecosystem provides for people. Ecosystem services can be divided into production, regulation and maintenance services, as well as cultural services.

Restoration is the process of returning an ecologically degraded or destroyed ecosystem or habitat to its natural state or as close to it as possible. Restoration measures support the natural structure and functions of an ecosystem or habitat, thus improving biodiversity and the resilience of nature.

No net loss of biodiversity is a principle according to which human activities must not reduce biodiversity or the ecosystem services provided by nature to humans.

Biodiversity refers to the natural diversity and variation of species and biotic communities in nature in the world or in a particular biotope. Diversity exists on three levels: the number of different species in a given habitat, the diversity of different biotopes and living environments, and the genetic variation within species.

Nature-based solutions, such as stormwater wetlands, are solutions to societal problems that rely on or are inspired by nature.

Biotopes are areas with specific environmental conditions and characteristic flora and fauna. Biotopes may be endangered.

A marginal effect describes the impact that the seam between two habitats has on biodiversity. The marginal effect can be observed in things such as forests adjacent to built areas or clear felling areas.

The blue-green structure is a network formed by the vegetative areas and water bodies of an urban structure and the green connections between them. In addition to a strategically planned green area network, the green structure includes all areas covered by the vegetation of the urban structure, regardless of the planning situation or land ownership. The blue structure complements the green structure with water elements, such as sea areas, small bodies of water and artificial water structures.

A green area refers to both public and private vegetative areas, such as parks, forests, beaches, fields and golf courses. A green area also includes the small waters within the area.

A green connection refers to green spaces or series of them that connect larger green areas to each other and serve the movement and recreation of people (recreational connection), the movement and spreading of organisms (ecological connection) or both.

Core areas are extensive, ecologically diverse nature areas, such as nature reserves.

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1 Introduction

The importance of diverse nature is understood more and more widely. Nature secures functional ecosystems that provide us with numerous natural benefits. According to international objectives, loss of biodiversity must be stopped by 2030. Despite these ambitions, biodiversity continues to deteriorate globally. In Finland, too, more and more species and habitats are becoming endangered. We need new ways to safeguard biodiversity.

Although threats to biodiversity are global, practical measures to stop the loss of biodiversity are ultimately implemented at the local level. The Espoo Story aims to prepare a roadmap so that biodiversity can recover and we can achieve no net loss of biodiversity by 2035.

Espoo strives to achieve urban development that supports biodiversity. As urbanisation continues, Espoo continues to grow at a ferocious pace. Construction inevitably affects nature, reducing and degrading habitats. In order to preserve as many natural areas as possible, we control construction primarily by increasing the density of urban structures located along good public transport connections.

This roadmap presents Espoo's biodiversity protection goals for 2035. The roadmap highlights five ways in which we are contributing to the achievement of our long-term goals. We make these operating principles more concrete through 13 development entities and 17 concrete measures for 2025–2029.

The responsibility for preserving our valuable and diverse nature lies with us all. Through the roadmap, we also aim to encourage the entire Espoo community to take action for biodiversity.



No net loss of biodiversity

No net loss of biodiversity is a principle according to which human activities must not reduce biodiversity or the ecosystem services provided by nature to humans.

In growing cities, habitat fragmentation and changes in land use pose a significant threat to biodiversity. The principle of no net loss of biodiversity is utilised project-specifically in the management of land use changes. Comprehensive nature surveys and data about the state of nature are basic prerequisites for safeguarding nature values.

The achievement of no net loss of biodiversity can be pursued using the mitigation hierarchy. According to the hierarchy, effort should always be made to avoid harm to nature. For example, building relatively densely prevents the creation of harm to nature, as it reduces the land area occupied by construction. Planning is the most essential tool for avoiding causing harm to nature.

If harm to nature cannot be avoided, effort should be made to mitigate it and restore nature in the area to be built. Actions that can be carried out in an urban area include planting trees, building green roofs and restoring streams to a more natural state. Measures to support biodiversity are

often also measures against climate change. Securing nature values on site also increases local residents' well-being.

If it is not possible to safeguard nature values, the last resort is to compensate for the remaining harm to nature by improving habitats elsewhere. This is called ecological compensation. Natural sites located elsewhere can be restored or protected as compensation measures. The Nature Conservation Act deems ecological compensation voluntary for construction projects.

On a city-wide level, the achievement of no net loss of biodiversity can be ensured through nature conservation and different actions that increase biodiversity, such as the management and restoration of green areas.

1. Avoid

harm to nature



2. Mitigate

harm to nature



3. Restore

nature in areas where construction takes place



4. Compensate

for the remaining harm to nature elsewhere



International and national guidance

Finland is committed to safeguarding biodiversity. Internationally and nationally, the goal is to halt the loss of biodiversity and restore biodiversity by 2030.

Espoo promotes the achievement of both national and international nature goals through its actions. Some of the actions are statutory (national and EU level), some are based on international agreements and commitments.

The most important international agreement protecting biodiversity is the 1994 **UN Convention on Biological Diversity** (Rio de Janeiro). The convention aims to protect ecosystems and plant and animal species, use natural resources sustainably and distribute benefits arising from the availability of genetic resources in a fair and equitable manner.

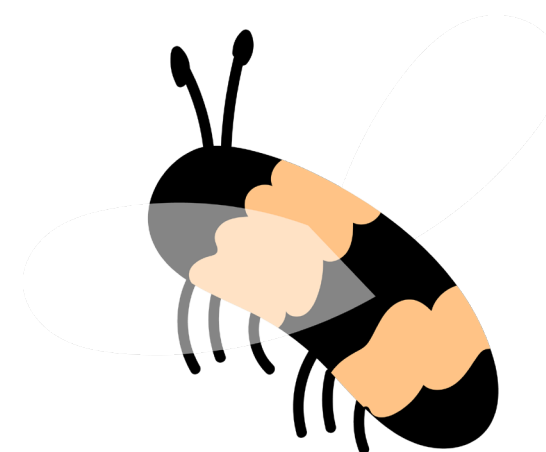
The Kunming-Montreal Global Biodiversity Framework of the parties to the UN biodiversity convention was adopted at the Montreal Biodiversity Conference in 2022. The parties to the convention agreed on new international biodiversity targets to halt biodiversity loss by 2030 and restore biodiversity. The framework has four targets for 2050 and short-term targets for 2030 for nature conservation, the sustainable use of biodiversity, and mainstreaming biodiversity and improving readiness.

The EU's biodiversity strategy aims to halt biodiversity loss and turn biodiversity development positive by 2030. The objective is to protect at least 30% of the EU's land and sea areas (10% to be covered by strict protection). In addition, the strategy aims to restore deteriorated biotopes. The goal for cities is to make nature, green infrastructure and nature-based solutions an extensive part of city

planning. The strategy requires all cities with more than 20,000 inhabitants to prepare a greening plan by the end of 2021.

The EU Restoration Regulation, which has entered into force, requires Member States and cities to promote the achievement of the objectives. According to the text of the regulation adopted by Parliament, EU Member States must restore at least 30% of deteriorated biotopes by 2030, 60% by 2040 and 90% by 2050. The restoration regulation requires the amount of green areas and canopy coverage in urban areas to be increased from 2030 onwards.

The EU is also preparing a **soil directive** based on its **soil strategy**, which aims to protect the soil and promote its sustainable use.



The national biodiversity strategy and action plan will be completed in 2024. Their goal is to halt the loss of biodiversity and restore biodiversity by 2030. In addition, by the end of the strategy period, in 2035, Finland will be nature positive. This means that the state of biodiversity will be at least at the same level as in 2020, and human activity will begin to strengthen biodiversity. According to the draft strategy, the biodiversity targets can only be achieved if Finnish people feel that the sustainability transition is implemented fairly. The sustainability transition means changes in all of society's systems, values and behaviour.

Municipalities are tasked with promoting the protection of biodiversity and landscape protection in their areas. Municipalities shall monitor and promote environmental protection so that local residents are guaranteed a sustainable living environment by protecting, managing and developing nature and the rest of the environment. Land use decisions, in particular, have a significant impact on biodiversity. In municipalities, land use is governed by the Nature Conservation Act and the Land Use and Building Act.

The Nature Conservation Act 9/2023 aims to protect biodiversity, preserve natural beauty and landscape values, promote adaptation to climate change, support the sustainable use of natural resources and the natural environment, increase citizens' knowledge of nature and environmental awareness, and promote nature research. Decision-making pursuant to the Act or the regulation issued on the basis of the Act must take into account the threat of a significant decrease or loss of biodiversity, even if there is no verified scientific information about it.

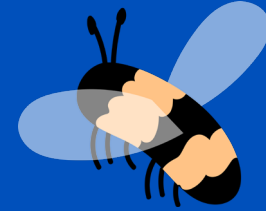
The voluntary ecological compensation referred to in the Nature Conservation Act is a new way of guiding voluntary compensation for nature damage in situations where legislation or other obligations do not already require compensation for nature damage. The decree of the Ministry of the Environment (933/2023) on voluntary ecological compensation specifies the provisions on the natural and regional equivalence of ecological compensation and the content of a compensation plan.

The objective of the Land Use and Building Act 132/1999 is to create the conditions for a good living environment and to promote sustainable development. Planning must take into account the preservation of nature values and the reduction of environmental damage, and the detailed plan may not include the destruction of any special nature values. In order to protect nature values, plans may also include conservation orders.

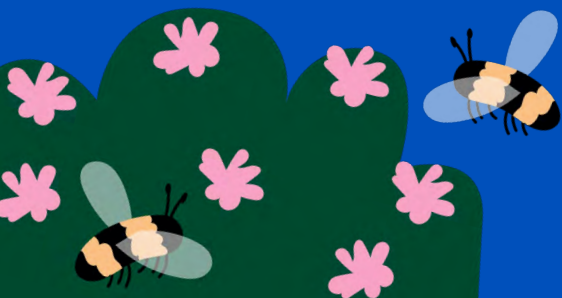
Planning should be based on an adequate impact assessment that identifies the significant impacts of the plan. The assessment takes into account the function and purpose of the plan.

The Land Use and Building Act is currently being revised. The Act will be divided into a building act and a land use act from the beginning of 2025. A reform of the Land Use Act has been initiated.





2 Purpose and objectives of the roadmap



2.1 Purpose and structure of the roadmap

The roadmap describes the goals and means to safeguard biodiversity within Espoo's borders. It consists of goals, operating principles, development entities and measures.

Purpose of the roadmap

The Espoo Story, or the city strategy, states that Espoo is a pioneer in reconciling a growing city with diverse nature. Espoo's urban development fosters, revives and increases biodiversity. The strategy also recognises the importance of local nature as a source of well-being and physical activity. The Espoo Story contains a concrete measure: we prepare a roadmap to support the recovery of biodiversity and achievement of no net loss of biodiversity by 2035.

In this roadmap, we set goals for safeguarding and improving biodiversity in Espoo. Through the roadmap, we highlight the best means at our disposal with which we strive to achieve no net loss of biodiversity. The goal is to encourage the entire Espoo community to take action for biodiversity. With the roadmap, we are also preparing for future changes in EU-level and national legislation concerning biodiversity and green structure.

We strive to develop further new and innovative approaches that safeguard biodiversity while also enabling the development and growth of the city.

Defining the roadmap's content

The roadmap focuses on securing and increasing biodiversity within Espoo's borders. In a growing city, changes in land use also cause changes in nature and biodiversity. The roadmap aims to avoid and mitigate the negative effects of nature and to increase biodiversity in the Espoo area.

Measures to mitigate climate change can have a positive impact on nature, but they are not addressed in this roadmap. Adaptation to climate change is included in the roadmap insofar as strengthening biodiversity also benefits adaptation work.

The roadmap does not address material selection, procurement practices, the consumption habits of residents and businesses, or their impact on biodiversity outside Espoo.



Structure of roadmap

The roadmap consists of four different areas: goals, operating principles, development entities and measures.

Goals for 2035

The goals of the roadmap are long-term goals as we strive towards the recovery of biodiversity and, ultimately, no net loss of biodiversity. On the basis of these goals, we identify development needs and measures and monitor the effectiveness of the roadmap. The roadmap observes international agreements and strategies, as well as national legislation aimed at safeguarding and enhancing biodiversity. These are described in more detail in section 2.5.

Operating principles for 2025–2035

The operating principles summarise how we promote the goals of the roadmap in the city's operations and in cooperation with our stakeholders and partners.

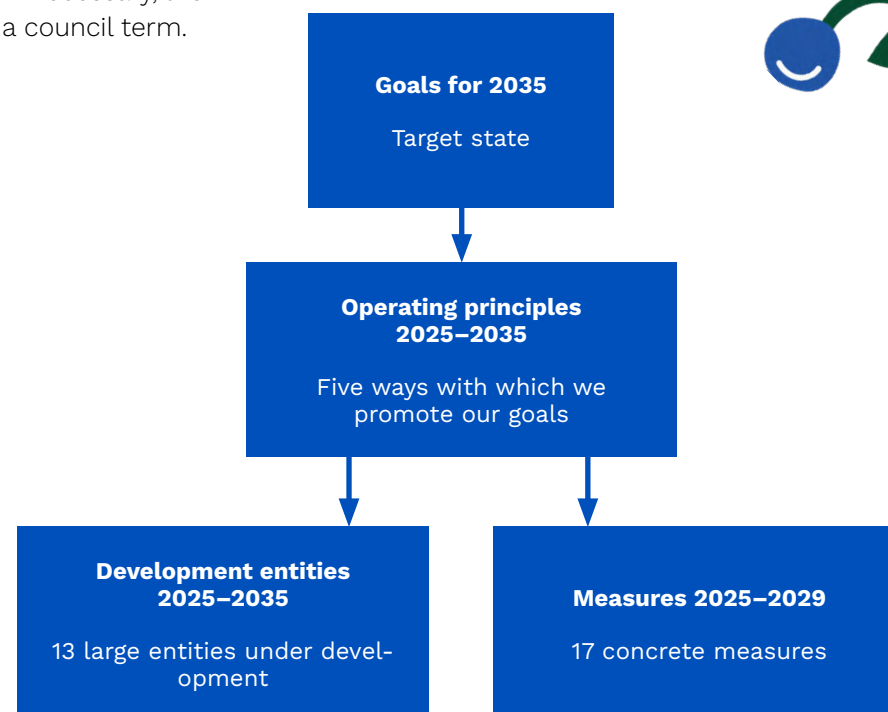
Development entities for 2025–2035

The operating principles are divided into 13 development entities, which describe the development needs to support biodiversity. The development entities describe the change in operations over a long period of time. Concrete implementation methods will be specified as the work progresses. The development entities aim to reduce the pres-

sure on nature and improve the state of nature by means such as protection and restoration. The city's opportunities for indirect influence have also been identified. Development entities are promoted as an integral part of the basic work of the units.

Measures for 2025–2029

The measures describe concrete actions to support diversity during the next council term. There are a total of 17 measures and they mainly include development activities that are not already included in the basic work of the units. If necessary, the measures will be reviewed once a council term.



2.2 Connection to other programme work and land use planning

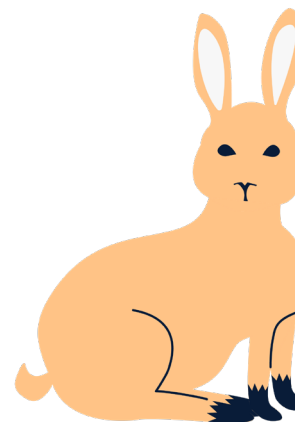
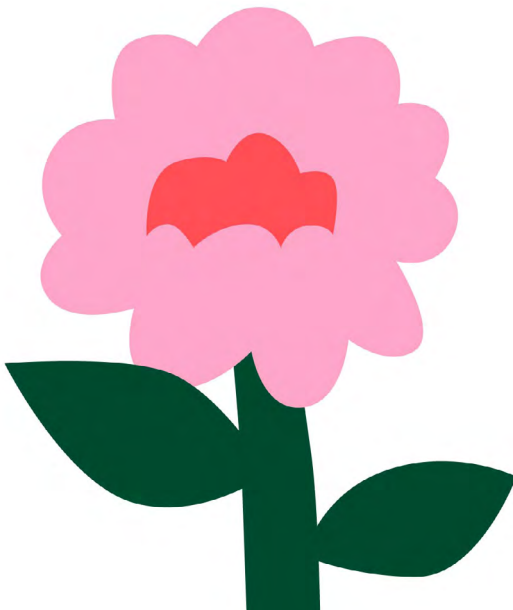
Espoo has already drawn up several plans and operational programmes that address practices and measures concerning biodiversity. Previous work has been compiled in the Urban Nature Plan report. The Nature-wise Espoo roadmap continues the work done in other operational programmes with a comprehensive approach.

In Espoo, the most significant impacts on biodiversity are caused by changes in land use. We avoid and mitigate the adverse environmental impacts of changes in land use and increase the positive impacts as part of land use planning and construction.

In addition to the city's strategy and action plans, land use planning is guided by the Land Use and Building Act (which will be revised at the start of 2025) and other special legislation. In land use planning, we align the goals of this roadmap with other goals guiding the city's development.

Operational programmes and action plans related to biodiversity

- Nature conservation action plan (2021–2030)
- Water protection action plan (2022–2027)
- Action plan for meadows and open areas (2021–2031)
- Green area programme consisting of several sub-projects
- Baltic Sea action plan (2024–2028)
- Stormwater programme (updated 2020)
- Action plan for adaptation to climate change (2022–2025)
- Espoo's action plan for promoting the health benefits of the blue-green infrastructure (2022–2030)
- Invasive species policy (updated 2023)



2.3 Preparation of the roadmap and communications

The roadmap has been prepared in the Urban Environment Sector through extensive cooperation with various parties.

Environmental Protection, City Planning Department and Public Works Department have all worked on the roadmap in close cooperation. Sitowise Oy has participated in the work as a consultant. The work preparation process is described in Appendix 2.

During the preparations, we discussed with the city's other divisions, Espoo-based companies, the ELY Centre, the Ministry of the Environment and representatives of the other cities in the Helsinki Metropolitan Area. We organised a decision-maker seminar on roadmap work and its objectives for the members of the City Board, City Planning Committee, Technical Services Committee and Environment and Building Control Committee on 17 May 2023.

The preparation of the roadmap is based on extensive study material, which we have used as background information. The studies make concrete ways in which we can support biodiversity in our growing city.

We have compiled the results of the work in the following reports:

- Literary survey of no net loss of biodiversity and examples from around the world, Nature-wise Espoo 1/2023
- Tools to assist biodiversity preservation provided for land use planning services, Nature-wise Espoo 1/2024
- Practices for safeguarding biodiversity in Espoo, Nature-wise Espoo 2/2024
- Report on the restoration potential of Espoo, Nature-wise Espoo 3/2024
- Urban Nature Plan – safeguarding biodiversity and promoting the recreational use of nature in Espoo

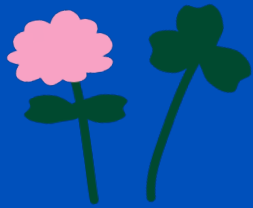
During the preparation of the roadmap, we also investigated the conditions and prerequisites for compensation in Espoo.



Nature-wise communications require sustained effort

We produced a communications plan and website for the Nature-wise Espoo roadmap work in spring 2023. On the site, we provide information about the background of the work and highlight the city's current nature-wise practices through case studies. We also use the website to publish roadmap work reports and articles in which we present their key results in an easily understandable manner. The articles are also available in Swedish and English.

Nature-wise Espoo is a collaborative effort: it requires the contribution of residents, communities and companies. That is why our communications highlight ways in which residents and communities can promote biodiversity. Nature-wise Espoo was featured in the libraries' environmental spring event series at the Sello Library in spring 2023.



3 Roadmap towards no net loss of biodiversity



3.1 Roadmap goals for 2035

Ecological network is functional and cohesive

- The ecological network consists of the core areas of nature and the connections between them.
- The regional and urban ecological network, which also includes urban nature and the ecological connections of running waters, is expansive. Active measures improve the connectivity of the network.

State of biotopes and natural species in Espoo has improved

- The structure and activities characteristic of the biotopes found in Espoo have been preserved. The preservation of the species characteristic of Espoo is ensured.
- The state of biotopes and species habitats has improved through active restoration and rehabilitation measures.
- Nature and species have been supported in adapting to climate change.
- Cultural, historical environments enrich urban nature.

Ecological condition of marine area and water systems is good or excellent

- The nutrient load on the marine area and water systems has been reduced.
- Active restoration and rehabilitation measures have improved the condition of water bodies and streams.

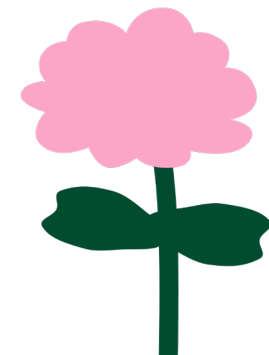
Comprehensive green area network and abundant urban green support biodiversity and secure ecosystem services

- The green area network is comprehensive and highly accessible.
- Built-up areas will increasingly have urban green, suitable for dense urban environments, which will support biodiversity and provide ecosystem services.
- Small water bodies and natural stormwater structures are an essential part of diverse urban nature.

Understanding and knowledge of nature has improved and diversity is actively promoted

- Understanding and knowledge of biodiversity and the factors affecting it has increased.
- The city, residents and companies actively promote biodiversity in their own activities and decision-making.

The goals of the roadmap are long-term goals set for 2035.



3.2 From goals to operating principles

The operating principles summarise how we will promote the goals of the roadmap in the city's operations and in cooperation with our stakeholders and partners until 2035.

Roadmap goals for 2035

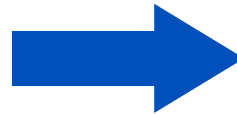
The ecological network is functional and cohesive.

State of natural biotopes and natural species in Espoo has improved.

The ecological condition of marine area and water systems is good or excellent.

A comprehensive green area network and abundant urban green support biodiversity and secure ecosystem services.

Understanding and knowledge of nature has improved and diversity is actively promoted.



Nature-wise Espoo



Roadmap operating principles 2024–2035

A. Our approach to strengthening the ecological network is proactive and systematic.

B. We use the mitigation hierarchy of harm to nature extensively in planning and implementation.

C. We develop operating methods as research data, legislation and national operating models develop, and as knowledge of nature increases.

D. We increase cooperation and clarify roles in the promotion of diversity.

E. We increase the Espoo community's opportunities to act for the benefit of biodiversity.

3.3 Operating principles and development entities 2025–2035

On a general level, operating principles guide the development work of ways to support biodiversity. 13 development entities have been derived from the principles. These entities describe what kind of development work is required. We promote the development entities as part of the basic work of centres, and their concrete implementation methods will become more defined as the work progresses.

Operating principles

A. Our approach to strengthening the ecological network is proactive and systematic.

B. We use the mitigation hierarchy of harm to nature extensively in planning and implementation.

C. We develop operating methods as research data, legislation and national operating models develop, and as knowledge of nature increases.

D. We increase cooperation and clarify roles in the promotion of diversity.

E. We increase the Espoo community's opportunities to act for the benefit of biodiversity.

Development entities

- A1** We protect the nature of valuable sites by establishing nature reserves.
- A2** We improve the connectivity of the ecological network.
- A3** We restore biotopes, species' habitats and water areas.
- A4** We promote the diversity and versatility of the blue-green structure.
- A5** In adapting to climate change, we primarily utilise solutions that increase and promote biodiversity.

- B1** We safeguard irreplaceable natural values on the basis of Espoo's classification criteria for natural values.
- B2** We avoid and minimise the creation of elements harmful to nature, restore nature during construction and create new habitats.
- B3** We only apply compensation when other means of the mitigation hierarchy are not possible and we prepare principles for using the compensation.

- C1** We develop the monitoring of the state of nature and how it changes and the management of knowledge about nature
- C2** We monitor the development of legislation concerning biodiversity and contribute to it proactively.

- D1** We improve the flow of information, competence and dialogue, and help individuals find their own role in the city's nature work.

- E1** We support the participation of Espoo residents in activities that enhance the biodiversity of their local environments.
- E2** We encourage businesses and landowners to support biodiversity.

We protect the nature of valuable sites by establishing nature reserves (A1)

We protect valuable natural sites and develop practices to safeguard their natural values in the long term. We also encourage other landowners to establish nature reserves.

The goal of nature conservation is to preserve biodiversity and stop the progression of biodiversity loss locally. The conservation work is guided by legislation such as the Nature Conservation Act, Forest Act and Water Act. According to the Constitution of Finland, everyone is responsible for safeguarding biodiversity. According to the Nature Conservation Act, municipalities are obliged to promote nature conservation in their area.

In Espoo, for example, the biotopes protected under the Nature Conservation Act include natural sandy beaches, hardwood forests, alder forests and meadows. In addition, some species are protected under other legislation, such as the EU Habitats Directive and the Nature Conservation Decree.

Establishing nature reserves for valuable natural sites is an effective means of safeguarding biodiversity. Valuable sites include, for example, endangered biotopes. We have identified valuable sites through measures such as Espoo's Action Programme for Natural Diversity. In particular, we protect rare or endangered biotopes and species that are not legally protected.

Nature conservation is most effective when protected areas are as large as possible in area and functionally and structurally connected to each other. In this case, the edge effects threatening nature values will be small and organisms will have the opportunity to move from one site to another. This will also ensure effectively the vitality of the species living in the city.

We protect nature by establishing nature reserves on land owned by the city. We also encourage other landowners to establish nature reserves. If necessary, we purchase valuable natural sites to protect, so that natural values and diversity will be preserved in the future as well.

The preservation of the nature values of a nature reserve is also affected by measures that take place outside the reserve's borders. We avoid activities that endanger nature values near nature reserves, and we adapt activities and construction to the environment close to nature reserves while preserving nature values. Edge effects are also reduced by the large size of the reserve.

In some areas, we can maintain conservation values with management measures. Examples of this include maintaining existing routes and removing invasive species. We investigate ways to safeguard the nature of protected areas in the long term. We develop management practices and declarations of closed seasons through which we can ensure that both nature and the ecosystem services it produces are protected.



PHOTO: ARI TURULA

A natural creek flows in the middle of Soidensuo highmoor. A nature reserve was established in the area in 2023.

We improve the connectivity of the ecological network (A2)

We strengthen the ecological network by preserving and improving ecological connections. Concrete means include, for example, green bridges, underpasses and tree planting.

A well-functioning ecological network is vital for biodiversity and its recovery. The ecological network maintains the vitality of valuable natural sites and species' habitats, as well as their ability to adapt to climate change. The ecological network in Espoo functions poorly in many places.

We nurture the functionality of the ecological network in order to maintain Espoo's natural species. In order to strengthen the network, we maintain and develop ecological connections: we increase the versatility and ecological quality of connections by taking into account different environments and the different needs of species. We identify critical gaps in ecological connections and improve their functionality. The means to achieve this can include building green bridges and underpasses, building trees and avoiding the use of fences. We preserve nature's core areas and other larger, cohesive green areas. We will also establish new nature reserves.

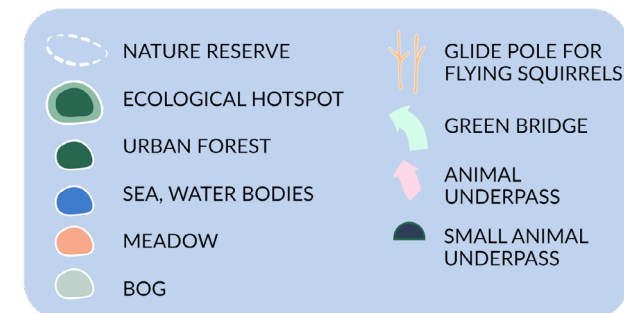
The development of an ecological network is site-specific: ecological connections cannot be replaced by restoring or protecting nature elsewhere. We update and develop functional and structural connectivity reviews of the ecological network.

Based on the resulting data, the ecological network can be taken into account in land use planning and project planning from the very beginning.

Strengthening the ecological network requires co-operation within the city organisation. We will draw up uniform goals to guide all planning and nature management. When planning and implementing measures, we take into account their timeliness in relation to the change in land use.

Means for improving connectivity of ecological network

- In master planning, we indicate a central network of main connections. We identify its development areas and explore development opportunities.
- In detailed planning, we secure the continuity of the main connections. We complement the network with local connections. We look for solutions to improve the quality of connections.
- In nature management, we maintain and increase the ecological diversity of connections.



The ecological network consists of the core areas of nature and the connections between them.

We restore biotopes, species' living environments and water areas (A3)

We support the recovery of biodiversity by restoring nature, i.e., by improving the state of nature. We systematise the collection of nature data and the selection of sites and means of restoration. We carry out restoration experiments on pilot sites, from which we collect monitoring data for the development of restoration practices.

Through restoration, we help nature recover closer to its original state. We can revive degraded ecosystems by improving their structure and functions. Restoration aims to accelerate the recovery of biodiversity and improve the resilience of nature.

We are currently implementing a number of measures aimed at supporting and restoring biodiversity. However, we do not have many restoration practices, with the exception of the utilisation of topsoil, and we have only carried out restoration work on a few sites. We have assessed the restoration potential of biotopes on the basis of geographic data.

In the future, we will refine the assessment. We identify restoration methods suitable for different biotopes and assess their effectiveness from the perspective of biodiversity and other benefits. On the basis of background studies and more detailed nature surveys, we are able to prioritise restoration

sites. In order to define the need for restoration, we must systematically update and increase nature data on different natural environments.

Planning and implementing restoration requires resources. Restoration can be a slow procedure and require a lot of sustained effort; it cannot be done as a one-time operation.

We test restoration practices on pilot sites for which we make and carry out restoration plans. We select the most effective restoration measures for each pilot site based on research data, good practices and experiences. Once the measures have been taken, it is important to monitor their impact. The management and monitoring of the pilot sites must be included in the restoration plan so that we can create a foundation for Espoo's restoration practices on the basis of experiences gained from the pilot sites.



PHOTO: NOELLE RENBERG

Water body restoration projects can improve the condition of running waters and also increase the number of trout redds, among other things.

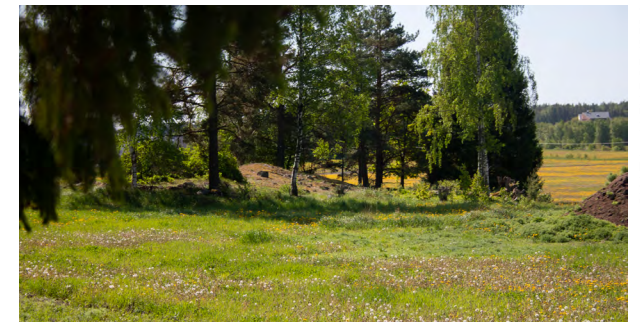


PHOTO: NOELLE RENBERG

Meadows need to be maintained so that they do not become overgrown. Management measures include the cutting and removal of saplings.



PHOTO: ENVIRONMENTAL PROTECTION IN ESPOO

The management can support such aspects of the forests that are known to benefit a wide range of different species. For example, a lot of decaying wood will be allowed to remain in forests.

We promote the diversity and versatility of the blue-green structure (A4)

We design and implement diverse and multifunctional green spaces, water structures and urban green that support biodiversity and provide residents with natural benefits. We develop design and operating principles and introduce new methods and tools.

The city's blue-green structure consists of parks, meadows, forests and waters. When the blue-green structure and green areas are ecologically diverse and have diverse environments, they support biodiversity and ecosystem services and create high-quality and healthy cities. As the urban structure becomes more dense, the diversity and versatility of green areas becomes increasingly important. We promote them comprehensively throughout the city.

In order to make the green area network more diverse and versatile, we work closely with different operators. We prepare uniform design and operating principles. We develop new methods and tools that we introduce as part of our basic work in the planning and management of land use and green areas. We establish the use of a block-specific green factor and contribute to the development of a regional green factor tool.

In green areas, we improve the diversity of vegetation and increase natural vegetation structures.

We reconcile the different demands concerning green areas and take functionalities and resident groups into account.

We use the green factor to guide the greenness of city blocks.

We also recognise the importance that quiet areas hold for residents.



We promote the naturalness of water bodies and small water bodies.

We take the erosion of green areas and the direction of recreational use into account as part of design and maintenance.

We promote the improvement of the natural state of edge zones.

In order to safeguard nature benefits, we indicate where diverse green areas can be located near the local residents.

In adapting to climate change, we primarily utilise solutions that increase and promote biodiversity (A5)

We take care of the ability of urban nature to adapt to climate change. We choose measures that support biodiversity while we prepare for the consequences of climate change.

Preserving biodiversity contributes to climate change adaptation. It increases the environment's ability to cope with changing conditions and restore the balance of ecosystems. At the same time, many means of adapting to climate change can also support biodiversity.

By supporting a cohesive and high-quality ecological network and expansive green areas, we promote the migration of species to new areas as the climate changes. Urban nature can adapt to climate change better when it is part of an unbroken network than when it is fragmented and weakened. We save extensive forest areas and thereby prevent storm devastation and support the movement of species as the climate changes.

Our climate change adaptation measures must have multiple objectives. Measures to prepare for heavy rain, floods, heat waves and storms must support the protection of biodiversity and other ecosystem services. We identify increasingly better measures that support both the prevention of

climate change risks and the strengthening of biodiversity. We communicate about multi-benefit measures more comprehensively than at present and support them in decision-making.

We identify the risks that climate change poses to biodiversity and the species and biotopes that are vulnerable to climate change. We proactively monitor the occurrence and spread of invasive species, as the number of invasive species in Finland will increase from the current level. For example, plant diseases plaguing hardwood are prevalent in Estonia, but not yet in Finland. The spread of these invasive species will have a detrimental effect on the condition of our street trees in particular. We prepare for, among other things, special care measures for forests.



The term multi-benefit can mean things such as the following practices

- We support species living in wetlands and small water bodies through stormwater solutions such as retention structures. With the right plant choices, we can support the absorption of stormwater.
- We preserve shading trees to alleviate the heat island phenomenon. In this way, we support the bird, insect and mammal species that nest in the trees.
- It is important to support and preserve the natural hydrology of water bodies, as climate change increases phenomena such as water erosion and eutrophication. Through them, it also threatens the habitats of many species.

We safeguard irreplaceable natural values on the basis of Espoo's classification criteria for natural values (B1)

We save the values and special characteristics of nature in Espoo. The tool we use to achieve that is the prioritisation classification of Espoo's nature values. The classification helps us rank sites according to their biotopes, species and other general criteria.

Nature reserves can be used to secure valuable natural sites, habitats and species. However, this alone is not enough to preserve biodiversity, as valuable nature also exists outside the protected areas. We want to preserve the values and special features of Espoo's nature and strengthen them. We also want to safeguard and improve the ecosystem services produced by nature.

In the prioritisation classification of Espoo's nature values, we rank these sites according to their biotopes, species and other general criteria. In addition, we take into account how significant the sites are for Espoo. The classification criteria include, in particular, the requirements for the protection of natural sites pursuant to the Nature Conservation Act. The Land Use and Building Act (to be revised and renamed at the beginning of 2025) guides the land use planning process, and in accordance with

it, nature must be preserved in planning and special values may not be destroyed. Espoo's criteria for classifying natural values is one of the tools in use, and in accordance with it, we direct land use to take place outside the most valuable areas.

We prepared the Espoo criteria for classifying nature values in the context of the action plan for nature conservation, and we will update it as needed. In the future, we will develop the nature value criteria to also take into account aspects related to compensation.

Criteria for the classification of nature values in Espoo

1: The sites in the category are protected by law

- The protection requirement is absolute.
- The sites are usually of national value.

2: The site has significant nature values

- The sites may be significant occurrences of individual endangered species or habitats, or entities formed by them. The sites are representative of their natural state and species.
- The protection and/or preservation requirement is strict, only particularly valuable natural sites are included.

3: The site has nature values, such as rare or near-threatened species and biotopes or entities formed by them.

- The sites also include endangered biotopes, the representativeness of which has weakened in some respects but which are still valuable in their characteristics and/or may return to a valuable state.
- The sites must be taken into account in all land use planning and operations.

4: Sites whose species and nature are a significant part of an ecological network and maintaining diversity

- The sites can be, for example, areas that protect or support valuable habitats and which can have significant recreational or landscape value.
- Saving the nature values of the sites is justified.

We avoid and minimise the creation of elements harmful to nature, restore nature during construction and create new habitats (B2)

We develop land use planning tools and ways to assess its impacts so that we can maintain the unity, connectivity and ecological quality of nature's core areas, as well as a comprehensive network of natural habitats and biotopes as part of the urban structure.

Nature values are already taken into account in land use planning. In the future, we will develop impact assessment and the utilisation of the mitigation hierarchy based on the assessment. In general planning, our primary goal is to avoid harm to nature. In detailed planning and other regional planning, we avoid and mitigate harm to nature. During the implementation phase, mitigation methods, in particular, will be specified further. However, on all levels of planning, we can both avoid and mitigate harm to nature.

In order to safeguard nature values, we assess and compare the impacts on biodiversity during planning. For this, we need comprehensive and up-to-date data about existing nature values. The development of the collection, interpretation and application of nature data supports decision-making based on information and transparency.

We develop plan symbols and regulations, as well as plan summaries, so that they support the implementation of solutions that protect biodiversity and the design solutions are clearly described in the plan documents. On the pilot sites, we monitor the realisation of the mitigation hierarchy and the progress of objectives from one planning level to another. We also develop building ordinance so that it takes the protection of biodiversity in construction areas into account better than it currently does.

In addition to established planning tools, we use and develop new planning tools and impact assessment tools suitable for environmental impact assessment. They make it easier to make the impacts on nature visible and take them into account in planning.

Avoiding and minimising harm to nature



Enhancing of land use and securing of green areas

We secure uninterrupted nature areas at a city-wide level by enhancing land use and building more densely. By mitigating climate change, we also indirectly safeguard biodiversity.



Preservation of valuable nature areas

We secure sites with special nature values by directing construction areas outside of them.



Securing ecological connections

We secure and maintain ecological connections between the core areas of nature which enable the movement of biota from one area to another.



Greening and creation of new habitats

In the built-up environment, we guide the increasing of urban green to take place in city blocks and public areas. We plan and built new parks.



Restoration of habitats during construction

During construction, we can improve the quality of existing nature areas by, for example, restoring streams, returning meadows to their natural state or adding decaying wood to green areas.

We only apply compensation when other means of the mitigation hierarchy are not possible, and we prepare principles for using the compensation (B3)

Ecological compensation is a new way of preventing harm to nature. In Espoo, we primarily prevent and mitigate harm to nature, but we also develop compensation practices and establish common principles for using compensatory measures.

Ecological compensation is still a new measure in Espoo and Finland. The Nature Conservation Act sets an ecological basis and preconditions for compensation, but there are still no operating models for the practical implementation of ecological compensation. We examine the opportunities for ecological compensation in Espoo and explore alternative operating models. We use pilot projects to gain experience in different tools and operating models. In the development phase of compensation practices, we cooperate with the authorities and other cities and monitor national developments. We will monitor the development of the nature value market and adopt it.

In the initial phase, we test the compensation on pilot sites. We identify suitable examples of city planning or construction projects and compensate for them. We calculate the compensation area need for the pilot sites and prepare compensation area plans. Once the compensation has been implemented, we monitor the condition of nature

in the compensation areas. Based on restoration potential reviews, we use areas suitable for restoration to establish a compensation area bank for the city's projects.

We will introduce ecological compensation and define uniform compensation principles that describe the need for compensation in different types of project, as well as the responsibilities and operating methods related to compensation. However, compensation is the last resort for alleviating the harm done to nature. Our priority is to avoid and mitigate harm to nature, as well as to compensate for losses on site during construction.

Stages of ecological compensation

Assessment of the need for compensation

The deterioration of the natural state is calculated in nature value hectares.

Planning of compensatory measures

The improvement in the condition of nature that can be achieved through compensatory measures is calculated.

Selection of compensation area

An area large enough to compensate for the harm done to the condition of nature by the project is selected. The compensation area may be several times larger than the construction area.

Implementation of compensatory measures

Habitats are restored by, for example, blocking ditches, increasing the amount of decaying wood, thinning out groves and restoring wetlands.

Management and ensuring permanence

A management and use plan for the compensation areas is prepared. The development of the natural state of the area is monitored on a multi-year basis.

We develop the monitoring of the state of nature and how it changes and the management of knowledge about nature (C1)

Maintaining biodiversity requires data about the state of nature and changes that have occurred in it. Comprehensive data allow us to assess things such as the overall picture of species and biotopes and the favourable level of conservation. Data about the environment, biotopes and species can be obtained from nature surveys and monitoring.

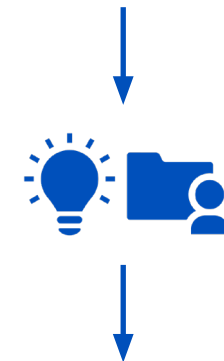
Data about the progression of loss of biodiversity is collected through long-term monitoring. In Espoo, we survey things such as water quality, endangered biotopes and water bodies' nesting bird populations valuable in terms of bird species. We use them to find out whether a species, species group or biotope has regressed, increased or remained the same.

The data is used to assess, for example, the conservation status of the species or biotope. This then helps us target the conservation measures and changes in land use correctly. Changes in legislation affect the need to collect nature data. Land use planning requires more diverse data on nature values. Therefore, we need to develop and increase the continuous collection of nature data. The data needs also change: nature surveys should in the future collect not only species observations but also data about things such as structural features of habitats (amount of decaying wood, etc.). Extensive habitat reviews are also often required in order to assess the favourable level of conservation of species.

We collect most of the nature data as surveys of environments' current state. We only monitor the long-term effects of planning and the steering effects of planning solutions in areas where habitats have been weakened under a special permit.

We develop the monitoring of changes in land use and the state of the environment. We also develop the monitoring of the occurrence of invasive species and the utilisation of data in the planning and implementation of measures. By regularly and systematically monitoring the state of nature, we obtain data at an early stage, before habitats disappear and species regress. We also develop the utilisation of the collected data so that we can react to the deterioration of nature with necessary measures before the deterioration of nature values reaches a critical level. For all of these, we need more resources.

The management of nature data requires continuous cooperation and development efforts from us. We need clearer common practices for commissioning nature surveys and storing data.



Nature-wise Espoo

This requires joint agreement and discussion on the preconditions of data collection, as well as well-functioning information systems. In order to make successful use of nature data, we need training and development of the skills required for interpreting nature data. We also participate in research cooperation aimed at building ecosystem accountancy as a tool for managing the municipality's nature capital.

We monitor the development of legislation concerning biodiversity and contribute to it proactively (C2)

We participate in the preparation of EU-level and national strategies, legislation and interpretative guidelines and guides. In the preparation, we highlight our growing city's perspective on themes related to biodiversity. We anticipate future changes and influence them in a timely manner.

The national and international targets for biodiversity and the guidance based on them change over time. Several strategies, laws and regulations are coming into force or are being prepared in the EU and Finland, which will affect land use and nature conservation in Espoo. These are described in more detail in the introduction. The new regulations also bring with them new evolving practices and operating principles, which are gradually becoming established nationwide.

We participate in the preparation of these strategies, legislation and interpretative guidelines and guides. Topical issues include the preparation of a national restoration plan based on the Restoration Regulation and the establishment of the compen-

sation practices and application guidelines of the Nature Conservation Act and Regulation. Through our participation, we can highlight the special features and needs of growing Finnish cities.

We accumulate data and carry out advocacy work by participating in cooperation groups and networks. We also identify new forms of cooperation and advocacy. We anticipate development trends and changes and assess their impact in Espoo. We affect coming changes in a timely manner.

Topical preparatory projects



European Union

- The Nature Restoration Law entered into force in 2024.
- A soil directive is being prepared.



Finland

- The preparation of the biodiversity strategy is in progress.
- Preparation of a revised land use law is in progress.

We improve the flow of information, competence and dialogue, and help individuals find their own role in the city's nature work (D1)

We nurture nature wisdom in our basic work and develop operating methods and personnel competence in the city organisation. Responsibility for promoting biodiversity is divided between several units. We improve the flow of information, clarify the division of responsibilities and intensify internal cooperation so that we can better manage this large entity.

We take biodiversity into account and safeguard ecosystem services as part of the basic work carried out in the city organisation. We take this theme into account in all planning and implementation. Nature-wise solutions move from general design to more precise design and implementation. We ensure this by improving the flow of information. We prepare internal guidelines for taking biodiversity into account in basic work in different units and develop the utilisation of information systems as part of improving the flow of information.

The Nature-wise Espoo roadmap means continuous assessment and development, which in turn means that the Nature-wise Espoo working group will continue its work. The members of the group implement the roadmap's further measures in the basic work of various units, as well as participate in the development work and its organisation. The group regularly reports to the division management and the City Board on the progress of the work. Time is reserved for development work alongside the basic work.

When designing solutions that promote biodiversity, we coordinate different development goals and

share information on different preconditions and perspectives. To ensure good dialogue and flow of information, we actively participate in cooperation groups at different levels and increase low-threshold discussions in the Urban Environment Sector and more broadly within the city. We clarify the roles of existing cooperation groups and the roles of different units in promoting nature wisdom.

Achieving the goals of the roadmap requires that the city organisation has sufficient expertise in biodiversity and ecosystem services. We develop personnel competence through training and by creating well-functioning practices. We also deepen the competence of nature experts. We familiarise ourselves with new and developing methods and tools related to this theme, and we carry out active development work.

In addition, we will also implement the roadmap through comprehensive cooperation at the EU level. Through the cooperation network, we will increase our expertise and share our own experiences. In cooperation projects, we will work together with partners to develop innovative solutions to support biodiversity both in natural areas

and in the built environment. We will also apply for external funding for development work from places such as the EU.



We support the participation of Espoo residents in activities that enhance the biodiversity of their local environments (E1)

In our role as a city, we communicate clearly and transparently about actions to protect biodiversity. At the same time, we encourage residents to take action for the benefit of biodiversity themselves.

Espoo residents are concerned about how local nature can be preserved while the city grows and develops. We can alleviate residents' concerns by communicating to them clearly about the city's actions. At the moment, we provide Espoo residents with information about biodiversity through platforms such as the city's website and social media. We meet residents on guided tours, at Nature House Villa Elfvik, at residents' events held by the Urban Environment Sector and at other events.

However, not all Espoo residents can be reached through the current channels. We are introducing new communication channels and means to reach new target groups, such as children and young people. In order to make our communications even more effective, we engage in cooperation more and more, both within the city and with other actors working on nature issues.

In Espoo, communities and associations can contribute to the management of their local environments by, for example, preparing an Our Park agreement with the city or organising a volunteer work event. Active environmental organisations and residents' associations hold a lot of poten-

tial in Espoo, and we can utilise this potential in efforts such as restoration of running waters and natural sites and management of traditional landscapes. We will also utilise stakeholder expertise in biodiversity work.

However, there are no policies for carrying out effective resident cooperation yet. In order to create a sustainable foundation for resident cooperation, the city will initially organise its own workshops and events and set an example for organisations. In addition to advice and guidance, we will explore the possibility of a nature restoration grant, similar to the water body restoration grant, that could act as an incentive for associations to improve the condition of their local natural sites.

In the future, we will inform others about measures to safeguard biodiversity and opportunities for participation under the theme of Nature-wise Espoo. Through consistent communications, our work for the benefit of nature will appear to residents and stakeholders more effective, clear and interesting.



PHOTO: JUSSI-PEKKA MANNER

Many invasive plant species have spread to vast areas in Espoo, and fighting them through community effort is important. Species that are particularly suitable targets for volunteer work are the Himalayan balsam, the rugosa rose and the lupin.

We encourage businesses and landowners to support biodiversity (E2)

Compared to other Finnish municipalities, Espoo owns little land. We can influence the biodiversity of areas owned by other landowners, especially through communications and advice.

The city owns only about one-third of Espoo's land area. The land is owned by bodies such as the state, parishes and private individuals. Thus, the city's sustainable management practices in its forests cover only a limited part of Espoo's nature and its riches. Landowners' awareness and knowledge of measures to prevent loss of biodiversity in terms of construction and forestry, for example, varies.

In built-up areas, biodiversity can be safeguarded not only in public green areas, but also in the yard areas of private plots, green roofs and other green structures. For example, we offer more advice, guidance and encouragement to preserve trees on plots. We can also offer advice on preserving vegetation on plots when landscape work permits and action permits are applied for. We encourage construction operators to carry out pilot projects promoting biodiversity in Espoo. We examine the possibilities of rewarding various acts for nature on, for example, an annual basis.

Agriculture and forestry can have significant environmental impacts that cover large areas. Through various campaigns and channels, we offer advice to farmers. The communications work carried out during the Pitkäjärvi water management project is an example of successful cooperation with farmers. We advise forest owners on conservation and how to finance it, as well as on the means of sustainable forest management. Here, cooperation with national and local stakeholders is particularly productive

Ways in which landowners and construction projects can support biodiversity

Preserving existing trees and soil on the plot



Older trees and trees of different ages are a better option for biodiversity, climate change adaptation and comfort than planted saplings. Favouring earth-banked gardens, existing topography and solum enables long lifespans for trees and garden ecosystems.

Multi-species and layered indigenous plantings



Multi-species vegetation of healthy domestic stock that is a balanced mix of trees, shrubs and herbaceous plants should be favoured in gardens and yards.

New habitats to support biodiversity



A green roof, especially a meadow roof or roof garden, can be used to promote the natural circulation of stormwater and support small animals such as pollinators. Even in dense urban structures, insect hotels and the preservation of decayed wood, for example, offer new habitats that support biodiversity.

Establishing a nature reserve



The establishment of nature reserves protects biodiversity. A property or parcel can be declared protected. The ELY Centre gives instructions and makes the establishment decision. In the nature conservation action plan, the city has identified suitable sites in Espoo.

Sustainable forest management



Forests are managed and used in an ecologically, economically and socially sustainable way. Securing decaying wood, preserving retention trees and leaving sufficient protected zones around bodies of water are examples of good nature management.

Preventing emissions into waterways



Emissions into waterways may impact the entire downstream body of water and its habitats. This can be prevented through actions such as stormwater management solutions, wetlands and zones protected from agriculture and by reducing the use of pesticides.

3.4 Measures 2025–2029

In the Nature-wise Espoo roadmap work, we have defined 17 measures that support the achievement of goals during the 2025– 2029 council term. The measures are compiled in the table on the following pages. The measures are divided according to the operating principles and they have been assigned responsible parties – either main responsibility or partial/shared responsibility. The measures will be taken into account and progress will be reported in the responsible parties’ scorecards.

Abbreviations for the tables

Operating principles:

A. Our approach to strengthening the ecological network is proactive and systematic.

B. We use the mitigation hierarchy of harm to nature extensively in planning and implementation.

C. We develop operating methods as research data, legislation and national operating models develop, and as knowledge of nature increases.

D. We increase cooperation and clarify roles in the promotion of diversity.

E. We increase the Espoo community’s opportunities to act for the benefit of biodiversity.

Goals:

1. The ecological network is functional and cohesive.
2. State of natural biotopes and natural species in Espoo has improved.
3. The ecological condition of marine area and water systems is good or excellent.
4. A comprehensive green area network and abundant urban green support biodiversity and secure ecosystem services.
5. Understanding and knowledge of nature has improved and diversity is actively promoted.

Responsible parties:

YMPSU = Environmental Protection
KSK = City Planning Department
KAKE= Public Works Department
RAVA = Building Control
ToY = Real estate department
Projot = Project directors

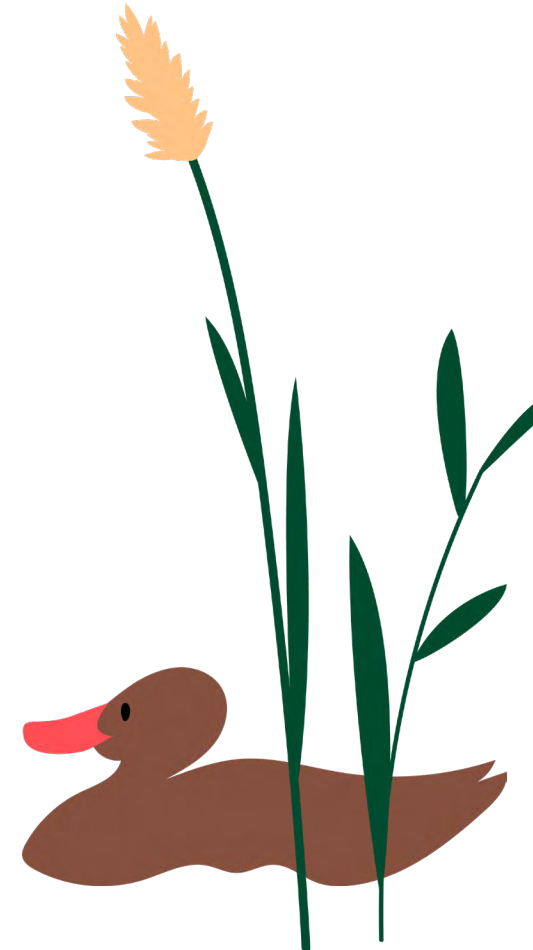


Table:

Measures to reach the goals and responsible parties 1/3

Operating principle	Measure	Goals being supported	Main responsibility:	Partial responsibility / shared responsibility:	Indicator
A. Our approach to strengthening the ecological network is proactive and systematic.	The city will buy valuable natural sites to be protected when it is critical for nature values and the integrity of protected areas.	1,2,3,5	ToY	YMPSU	The number and area of natural sites purchased by the city.
	We will improve the functionality of key development points for ecological corridors.	1,2,4,5	KAKE, KSK	YMPSU	Plans and measures to improve the functionality of the development points, as well as their number.
	We will support the connectivity of protected areas with broader nature entities.	1,2,3	YMPSU, KSK, KAKE	–	Master plans, nature and landscape management plans and restoration sites that support the connectivity of protected areas.
	We will take into account the need to prepare for climate change when establishing protected areas.	1	YMPSU	–	A study on the means of preparing for climate change in the establishment of protected areas has been carried out.
	We will explore areas suitable for restoration and prepare restoration plans.	1,2,3,5	YMPSU, KAKE	–	Areas suitable for restoration have been surveyed. Number of restoration plans prepared.
	We will pilot restoration on city land in 2–4 locations.	1,2,3	KAKE	YMPSU	Number and area of restoration pilots.
	We will develop the natural construction of green areas and pilot new solutions and materials in things such as technical structures.	4,5	KAKE	–	Number of pilots implemented.

Table:

Measures to reach the goals and responsible parties 2/3

Operating principle	Measure	Goals being supported	Main responsibility:	Partial responsibility / shared responsibility:	Indicator
B. We use the mitigation hierarchy of harm to nature extensively in planning and implementation.	We will develop and establish tools, such as regional and city-block-specific green factors, for planning and assessing impacts.	1,2,4	KSK	RAVA	A city block-specific green factor has been established. The development of the regional green factor is ready and guidelines for its use have been prepared. Piloting and use of other tools.
	We will adjust the building ordinance so that it better guides to safeguarding and increasing biodiversity and urban green.	4,5	RAVA	YMPSU, KSK	The building ordinance has been updated and this has taken into account aspects such as the city block-specific green factor.
	We will pilot compensation calculation in city projects in 2–4 locations.	1,2,5	KSK	YMPSU, ToY, Projot	Number and area of compensation calculation.
	We will define the principles of ecological compensation.	1, 2, 4	YMPSU, KSK, KAKE	-	The City of Espoo's principles for ecological compensation have been defined.
	We will develop and implement sustainability criteria for commitments related to the plot conveyance terms and land use agreements.	4,5	ToY	YMPSU, KSK, Projot	Prepared sustainability criteria for commitments.

Table:

Measures to reach the goals and responsible parties 3/3

Operating principle	Measure	Goals being supported	Main responsibility:	Partial responsibility / shared responsibility:	Indicator
C. We develop operating methods as research data, legislation and national operating models develop, and as knowledge of nature increases.	We will enhance the collection and sharing of nature data by, for example, establishing a nature knowledge system.	5	YMPSU	KSK, KAKE	Nature surveys processed through the nature information system account for the share of all nature surveys in Urban Environment Sector (target 100%).
	In order to form an understanding of the initial situation, we will increase the coverage of information on biotopes in Espoo.	2,3,5	YMPSU	KSK	Number of biotope surveys.
D. We increase cooperation and clarify roles in the promotion of diversity.	We will prepare the units' own tool kits for taking biodiversity into account and report on them in the scorecards of the units.	1,2,3,4	YMPSU, KSK, KAKE	-	The tool kits have been prepared, they are reported in the scorecards and the staff have been instructed in their use.
E. We increase the Espoo community's opportunities to act for the benefit of biodiversity.	We will create a website that is open and understandable to everyone and contains information about nature work in Espoo and the progress of the measures.	5	-	YMPSU, KSK, KAKE	The website has been created.
	We will develop and adopt a cooperation model with which we encourage, guide and coordinate the actions of residents and communities for the benefit of nature as a partner of the city.	4,5	YMPSU, KAKE	KSK	The collaboration model has been created and implemented.

4 Implementation of the roadmap

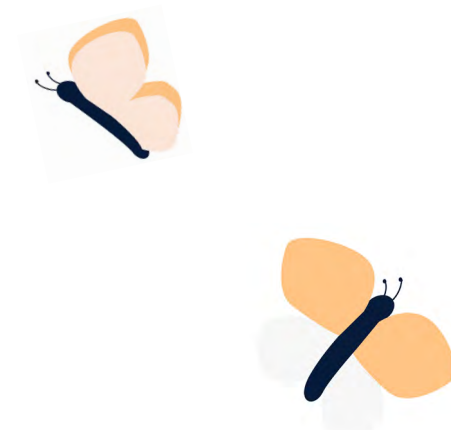


4.1 Progress and monitoring until 2035

In roadmap work, we have identified development needs that reach until 2035. We have compiled them into development entities and further into measures, on the basis of which development proceeds systematically and in stages. The goal is for the new operating methods to be in place by 2035, supporting the strengthening of biodiversity.

Development actions and changes in work, especially in the early stages, take up staff's working time, but in the coming years, new operating methods will become part of the routine basic work. We promote the development needs and measures identified in the roadmap within the resources available to us, so that the development work is gradually reflected in the priorities and emphasises of our work. We monitor the progress of the work with the help of indicators and assess it multiannually.





Sustained development and continuous evaluation

Promoting the goals of the Nature-wise Espoo roadmap is development work that requires sustained effort. We aim to develop and establish new practices one step at a time, initially through experiments and pilots. The development of measures is influenced by many operating models and guidelines, which are only just beginning to take shape on a national level. Therefore, development work must be carried out in broad cooperation and in stages.

The goals and operating principles extend beyond council terms all the way to 2035. They are updated only if required by legislation or national operating models. The measures are more concrete short-term goals that are updated as the

work progresses. The Nature-wise Espoo working group will continue its activities even after the completion of the roadmap. The working group monitors the progress of the measures and plans the next steps of the work. The working group reports annually on the progress of the work to the City Board and the steering group. The measures are refined every council term. A possible external overall assessment of the progress of the work is also prepared each council term.

2021-2025		2025-2030	2030-2035	2035-
- Preparation of the roadmap - Reports and new information needs - Overall picture and the need for change - Ways to increase nature wisdom in routine work in key units		- Implementation of the roadmap - Piloting and implementation of new practices - Changing of routine work practices in all units - Change management - Development of new practices	- Implementation of the roadmap will continue - Establishing of new practices and changes to routine work in all units - Continued development of new practices	- Roadmap goals achieved - Monitoring continues - Continued development of new practices

Monitoring in accordance with the appropriate level of precision to support the achievement of the objectives

Monitoring the achievement of the goals of the roadmap

In order to verify the preservation or improvement of biodiversity, diversity must be measured and compared to the initial state or the target level. Biodiversity includes different levels, and there is no easy way to measure it. Therefore, indicators that simplify diversity are often used. Through these indicators, a change that has occurred in factors that affect diversity can be demonstrated.

Improvements in the state of nature occur at their own pace and often slowly, but many measures and their monitoring must be started quickly. Long time series are important in monitoring the state of nature, and obtaining the series requires the continuous production of nature data.



We monitor the achievement of the goals of the Nature-wise Espoo roadmap mainly through indicators that describe biodiversity and the change occurring within it. Some of the indicators are already in use, and we will develop them if necessary. A few new indicators will be introduced through international monitoring. In addition, we monitor the development of biodiversity on the pilot sites of the measures.

In addition, we need new cost-effective indicators for monitoring the state of local nature and Espoo's own operations. The development of these indicators is a prerequisite for monitoring the effectiveness of the Nature-wise Espoo work. We develop and use simple indicators that are monitored by different profit units whenever possible.

Indicators for the achievement of the goals of the roadmap

Our current indicators

- Development of the number of nature reserves and their share of the overall area
- Development of the ecological status of surface waters (Finnish Environmental Institute)
- Development of the number and share of forested areas and old-growth forests

Indicators to be monitored

- Development of the share of canopy cover in Espoo's overall area and in the urban area
- Surface area of green areas and its change
- Number of street trees and its change

Indicators the implementation of which within the Nature-wise Espoo monitoring requires further refinement

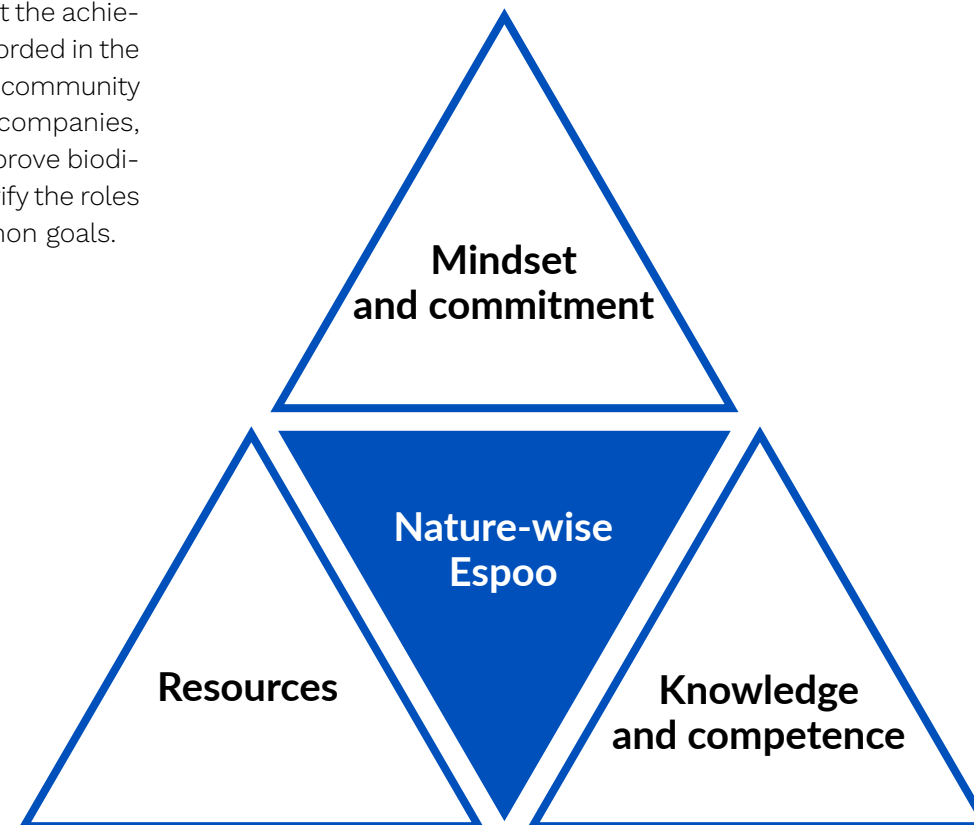
- Number of restored areas on city-owned land
- Number/area of water body restorations/ share of restored running waters of water body restorations
- Amount of water permeable surface and its change
- Number of stormwater structures
- Number of residents' cooperation events organised by the city

In addition, new indicators are needed in relation to things such as species, habitats and nature-based solutions. The implementation of these requires defining the content.

4.2 Prerequisites for the implementation of the roadmap

The Nature-wise Espoo roadmap implements the city's strategic goals. Implementing the roadmap requires a shared mindset and strong commitment from the Espoo community. Changing operating models and introducing new tools requires time and other resources. As we commit to development, new ways of working will gradually become part of the basic work.

By promoting the roadmap, we support the achievement of the city's strategic goals recorded in the Espoo Story. All members of the Espoo community – staff, city management, residents, companies, decision-makers and others – can improve biodiversity. Through roadmap work, we clarify the roles of different parties in achieving common goals.



Development of operations within the city organisation

Sufficient knowledge and competence create the basis for the implementation of practices that take nature into consideration. It has been discussed in more detail in the context of the above development entities.

In order to achieve the goals described in the development entities, we need to change many of our operating methods and increase cooperation within the city. The close involvement of staff in the development of cooperation and processes supports commitment and the formation a shared mindset within the city organisation.

We change the usual operating models and the prioritisation of work so that we take biodiversity into account in our operations better and more extensively than before. This is where we also need new competence. We increase the staff's competence through measures such as training, and we take new competence needs into account in future recruitment. We can also buy expertise from outside the city organisation.

Developing operating models and establishing them widely as part of the units' basic work takes time and effort, especially in the early stages of the work. Completely new work packages have a significant employment potential which we develop gradually further through preliminary studies and

pilots. Gradually, new operating methods become part of the basic work of the units.

Impact on the use of resources

We implement development entities and measures within the resources available to us while we also take into account any other targets and duties, some of which are statutory, set for the units. The development and introduction of operating methods require changes in the focal points and prioritisation of work.

The implementation of the measures and development entities of the roadmap has a wider impact on the basic work of the units and reduces the resources available for other work. This applies to both internal work and the purchase and guidance of consult services. The allocation of resources to roadmap work can lead to, for example, the prolongation of planning processes and other projects.

In addition to planning and management practices, costs are created by infrastructure investments that can be used to improve biodiversity in the built-up environment. The functionality of ecological connections can be improved with things such as flying squirrel posts, green bridges or green underpasses. These can have significant cost impacts.

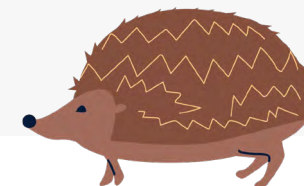
Effects on work in the Urban Environment Sector

Stronger emphasis on biodiversity in basic work

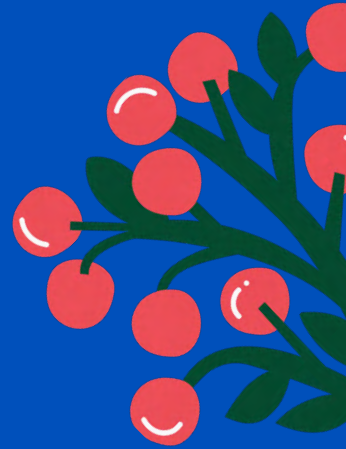
- We support biodiversity increasingly more extensively in the basic work of the units. We adopt nature-wise practices as a starting point for planning and implementation. In our communications, we explain the importance of solutions from the perspective of biodiversity.
- Investing in biodiversity increases expert work and research needs in fields such as land use planning and the planning and management of green areas. Reconciling nature perspectives with other planning goals is complex and challenging work. These all impact the duration of the planning processes.

Development work and establishment of its results

- The development for current operating models and processes takes time, especially at the beginning, before it becomes part of the basic work.
- The implementation of the roadmap also involves completely new methods, tasks and tools. For example, the development of restoration and ecological compensation methods will take up working time in the coming years.
- Development and establishment require extensive cooperation as well as trained and committed staff.



5 Current state of biodiversity in Espoo

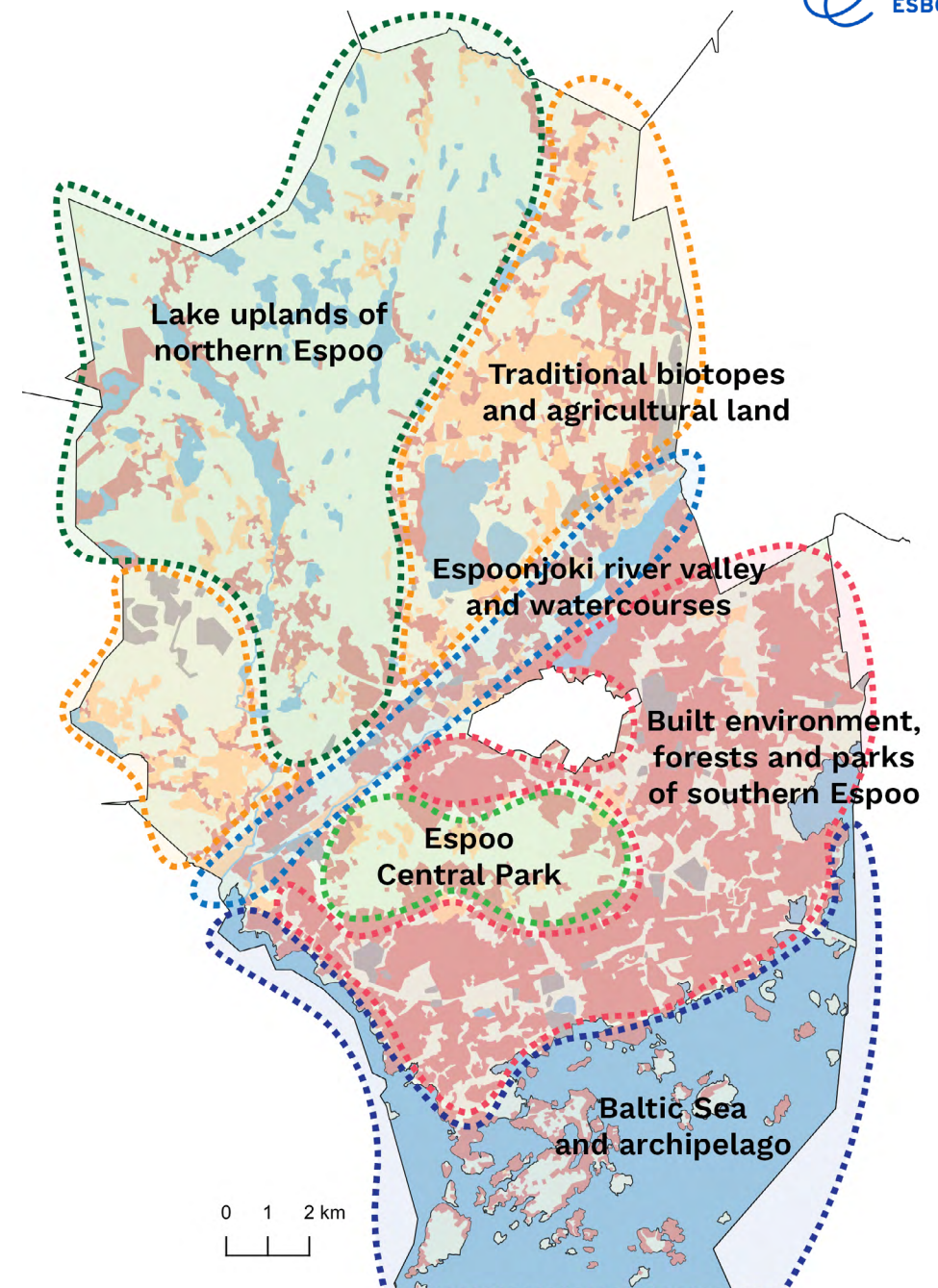


5.1 State and characteristics of nature in Espoo

Many of the gems of the nature of the Helsinki Metropolitan Area are located in Espoo, and the city also boasts several valuable natural sites that represent a wide range of habitats. The forests of Northern Espoo are home to old-growth forest species, many of which are endangered. Espoo's numerous rivers and streams are a rarity in Finnish urban conditions.

More than half of Espoo's land area is forest. The largest uninterrupted nature areas are located in northern Espoo, but there are numerous local forests and green areas in central and southern Espoo as well. Forests are mostly spruce- or pine-dominated dry northern forests with some deciduous trees. Lush groves also have broad-leaved trees and hazels.

The bedrock of Espoo is ragged and the terrain is very uneven at places. Elongated lakes have emerged in fissure valleys, and numerous small ponds and swamps have emerged in smaller rock depressions. In Espoo, bogs are typically swamps where stunted pines and plants such as the marsh tea, bog whortleberry and heather grow.

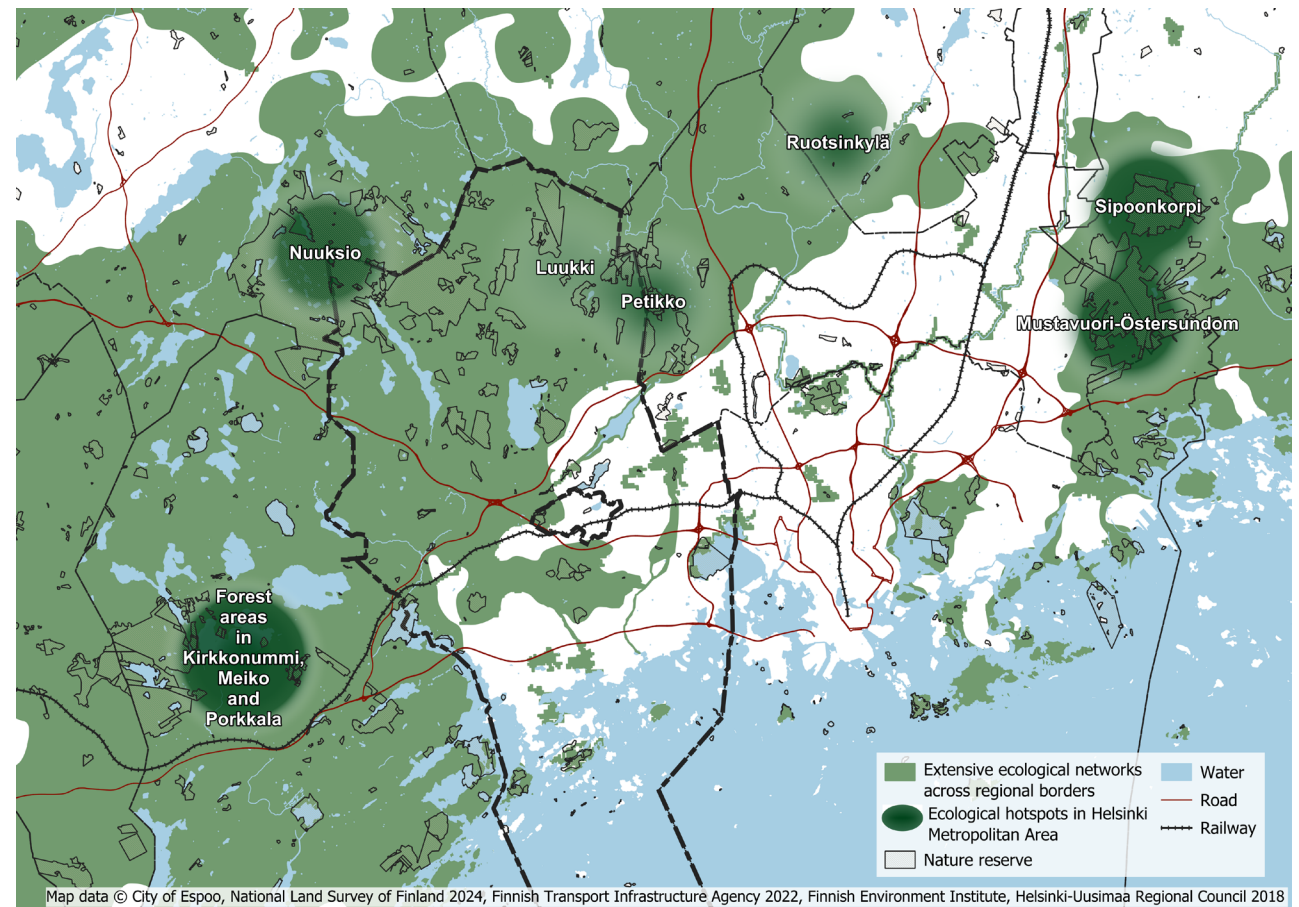


Espoo's ecological network

Valuable nature areas, areas that support them and the green connections between them form an ecological network that allows living organisms to move from one area to another and spread there. The network allows biota to move and spread from one area to another.

Espoo's ecological network is still largely functional and it connects vast natural, green and coastal areas to each other. Protected areas and regionally significant natural sites form the backbone of the ecological network. Large roads, railways and built-up areas disrupt the ecological network, and many of the green connections are narrow and susceptible to disturbances.

Continuing green connections even outside city borders is vital for biodiversity, as Espoo's nature is part of the Helsinki Metropolitan Area's green circle and regionally valuable network of green areas.



Endangered species and biotopes

The nature in Espoo is varied and diverse. However, species and their habitats are still becoming endangered here: Of the species living in Espoo, hundreds are endangered or near-threatened. The most endangered species are found in butterflies and beetles. However, not all species and species groups have the same amount of observation data collected about them. Of the species occurring in Espoo, the best-known are birds, mammals and vascular plants. Thanks to research and people's recreational interest, the beetles, butterflies and moss found in Espoo are also relatively well known.

There are also species in Espoo that the Nature Conservation Act defines as being specially protected. These include, for example, the light orange underwing and the beetle species *Bembidion monticola*. In Espoo, species listed as strictly protected under the EU Natural Habitats Directive include the flying squirrel and several bat species.

In addition to individual species, many biotopes have become endangered, which affects the chances of survival of the species living in them. For example, all traditional environments, such as meadows and fields, are endangered. In Espoo, endangered bogs and groves have been surveyed. For the archipelago and underwater nature, data about how endangered species and biotopes are remain incomplete.

Examples of endangered biotopes in Espoo:



PHOTO: ANNA HAKALA

KDry northern forests (EN, endangered)



PHOTO: ENVIRONMENTAL PROTECTION IN ESPOO

Rugged rock meadows (CR, critically endangered)

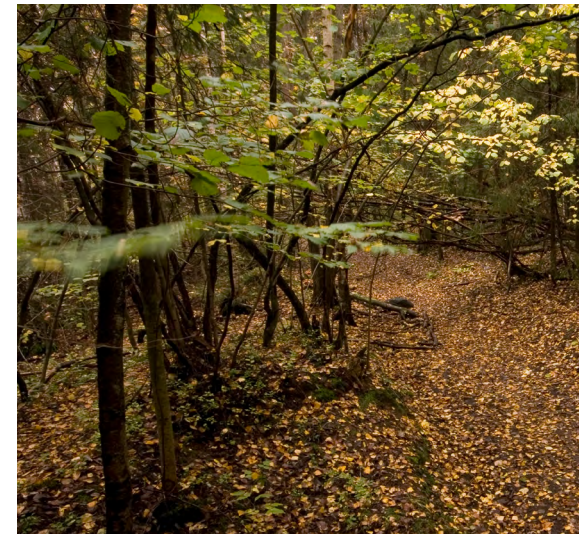


PHOTO: ENVIRONMENTAL PROTECTION IN ESPOO

Hazel groves (VU, vulnerable)

5.2 Biodiversity in a growing city

Changes in land use are the most significant factor reducing biodiversity in Espoo. Even though Espoo is a large, growing city, it still has an exceptionally large amount of diverse nature.

The urban structure of Espoo is characterised by how polycentric and network-like it is. Densely built and vibrant urban centres are surrounded by detached houses and an extensive network of green areas. Espoo still has a lot of green and diverse nature. Proximity to nature is one of the city's most important elements of attraction for Espoo residents.

Due to urbanisation, Espoo is growing strongly. Reacting to the pressure to grow requires both new construction areas and building more densely in existing built-up areas. Effort is always made to take nature values into account in the planning.

The purpose of city planning is to reconcile very different objectives. Therefore, there are times when construction must be directed to areas with recognised nature values. As the population increases and the urban structure becomes more dense, reconciling the different needs of green areas becomes more challenging. Green areas are needed, not only to secure biodiversity, but also for recreation, stormwater management and production of other ecosystem services.



5.3 Biodiversity has been promoted in Espoo for a long time

Espoo has for a long time carried out development work to take nature values into account. Protecting biodiversity has been part of the Espoo Story, the city's strategy, for several council terms. The city has a lot of effective practices, but as the operating environment changes, the practices need to be developed further.

Means to avoid and mitigate damage to nature are already widely utilised in land use planning in Espoo. A key tool for this is the biodiversity rating system that Espoo has developed and according to which all the conclusions of nature inventories are prepared. So far, Espoo has mainly restored running waters and lakes, but only a few natural sites have been restored overall. In the future, restoration and compensation practices will take shape in parallel with the development of national operating models.

The forests owned by the City of Espoo are managed using methods that can be used to reconcile the needs of biodiversity and recreational use. Espoo owns little land compared to other large cities in Finland: the city owns only about a third of Espoo's land area. Thus, the city's sustainable management practices in its forests cover only a limited part of Espoo's nature and its riches.

The prevention of invasive species is carried out in Espoo in a sustained manner and according to the city's own invasive species policy. In the invasive species policy, development needs and future challenges have been identified in relation to things such as climate change.

The importance of nature and recreation in planning has increased in recent years, which has increased the need for resources. The challenge is to find time for training, monitoring the field of operation, as well as developing and implementing new good practices, in addition to basic work. Monitoring land-use change and the state of the environment also requires resources that have a limited supply. At the moment, the implementation of biodiversity targets in practice cannot be sufficiently monitored, so there is no clear overview of the situation.



PHOTO: NOELLE RENBERG

Flying squirrels can be found in Espoo in both large forest areas and densely built-up urban environments. Espoo is in many ways a pioneer in collecting, recording and utilising geographic information about the flying squirrel. When preparing nature reports, precise data about the trees used by flying squirrels are recorded using GPS meters.

In Espoo, the collection and storage of nature data are at a reasonable level and are constantly developed. However, the need for data about the state of nature and how it changes is growing all the time. Up-to-date data are needed so that measures to restore nature or changes in land use can be targeted appropriately.

Espoo has many different programmes, action plans and operating models related to biodiversity. However, due to the large number of programmes and plans and other elements, the resulting entity can remain fragmented and the content of the guiding documents might not always become an integral part of the basic work of the units. Cooperation between the different units of the city organisation is effective. However, information does not always flow from one unit to another, as the city organisation is extensive and there are many stakeholders. In some cases, it is difficult to reconcile conflicting goals.

We will continue to make use of these:

- Espoo has comprehensive data about the state of the environment and a biodiversity rating system. Nature surveys are used to continuously collect up-to-date data about the state of Espoo's nature to support planning. The nature data are available to all city employees.
- Cooperation between experts from different fields is effective in avoiding and mitigating plan projects' impact on nature, as well as in forest management planning.

These we still need to improve:

- Espoo does not have much experience in restoring natural sites, nor practices or operating models needed for it.
- While basic work is being carried out, there is not enough time left to develop work that promotes biodiversity.



Appendices



Appendix 1.

Preparation of the roadmap

The roadmap has been prepared in the Urban Environment Sector. In the Urban Environment Sector, the work has been guided by a steering group and an operational management team. The project team responsible for the preparation of the roadmap has included Tia Lähteenmäki, Ari Turula, Mira Soini, Saara Olsen, Anna Hakala and Marika Rönnerberg from Environmental Protection, Paula Kuusisto-Hjort, Meiri Siivola, Tanja Hämäläinen, Mari Soini and Heli-Maija Nevala from the City Planning Department, as well as Tiina Peippo from the Public Works Department. The roadmap work has had two project managers, one from the City Planning Department and the other from Environmental Protection: Paula Kuusisto-Hjort (KSK) as well as Ari Turula (8/2022–9/2023), Tia Lähteenmäki (until 8/2022) and Marika Rönnerberg (YMPSU, as of 9/2023).

The work involved Sitowise Oy as a consultant, and the company prepared partial reports and background studies for the work, worked as an expert on the contents of the roadmap, was responsible for the layout of the work and participated in the organisation of interaction. Sitowise's project managers for the work were Aino Karilas (until 9/2022) and Vilja Larjosto (as of 10/2022). Rest of Sitowise's project group: Heli Nukki, Lauri Erävuori, Jaakko Kullberg, Anu Riikonen, Kirsikka Mattila, Henriikka Salonen, Elli Lakka, Elina Salin and Maarit Virkkunen.

The preparation of the roadmap has been communicated about extensively to the monitoring group, which has included representatives of the city and the ELY Centre. The group met twice during the preparation stage. Two corporate cooperation events were also held during the preparation. In addition, internal city workshops have been organised concerning the work, as well as presentations for the management teams and staff of the various centres. In connection with preparing the roadmap, there has also been cooperation with representatives of the business world.

Strategic steering group:

Olli Isotalo (chair)

Tarja Söderman (YMPSU)

Torsti Hokkanen (KSK)

Essi Leino (KSK)

Harri Tanska (KAKE)

Operative management team:

Tarja Söderman (chair) (YMPSU)

Essi Leino (KSK)

Anne Mannermaa /KAKE)

Leena Ihalainen (KAKE)

Kati Tuura (KAKE)

Meiri Siivola (KSK)

Mira Soini (YMPSU) until 31 January 2024

Saara Olsen (YMPSU) as of 1 February 2024

Heli-Maija Nevala (KSK)



Appendix 2.

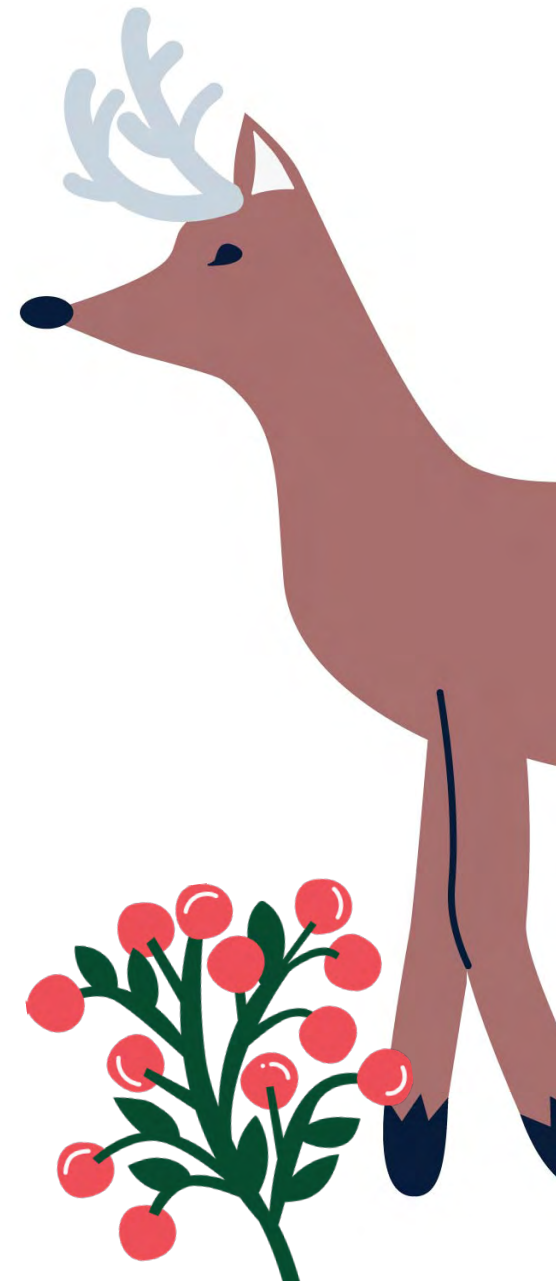
Conclusion of the decision-maker seminar on 17 May 2023

As part of the roadmap work, a seminar was organised for the City Board, the City Planning Committee, the Technical Services Committee and the Environment and Building Control Committee at the Espoo Council House on 17 May 2023.

The theme of the seminar was “What do nature wisdom and no net loss of biodiversity mean in Espoo”.

The topic was discussed through workshops. The workshop highlighted the following ways to safeguard and improve biodiversity in Espoo:

- Improvement of ecological connections and securing of the connectivity of the green area network.
- Rehabilitation of running waters and lakes.
- Considering valuable natural sites, “hotspots”, in planning and implementation.
- Preservation of local forests and other local green areas.
- Non-management of forests or forest management that is as natural as possible.
- Increasing of the diversity of gardens with, for example, insect hotels.
- The city’s support for various volunteer projects that enable residents to contribute to improving biodiversity.
- Consideration of the safeguarding and restoration of nature values in land use agreements. Ecological compensations are one way for companies to secure biodiversity.



Appendix 3. What is biodiversity

Biodiversity refers to all the diversity and variation that occurs in nature. Natural variation occurring in nature includes: the number of species in a certain habitat; the occurrence of different biotopes in a particular area; the genetic variation within a species that ensures diverse genetic makeup for future generations.

Functional diversity means that various natural processes are stable and secure. Such processes include, for example, the absorption of water into the soil, the growing of plants and the formation of new forest litter. The climate and soil are significant for what types of species occur in a particular habitat.

The relationships between species and their habitats can be complex. Biodiversity is like a web where all species are interconnected. This network maintains the preconditions for life on Earth. The extinction of one species may thus also threaten the survival of many other species.

The habitats of species are subject to various changes. A diverse and varied environment can withstand them better than an unbalanced natural environment. For example, a forest with a lot of trees of different ages and species is more resistant to pests, droughts or storms than a forest with limited species.



Diversity of nature

Inherent diversity within a species, which allows the species to adapt to changes in the environment

The number of different species in a particular habitat, which indicates how rich and variable the environment is

Diversity of different biotopes and habitats. Different species have adapted to different habitats, which means that they are encountered in places such as groves and rocky meadows – the loss of one habitat cannot be replaced by another.

Loss of biodiversity

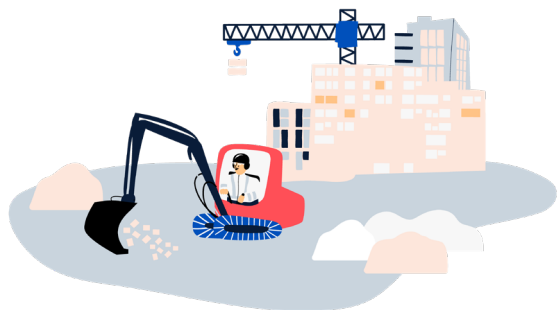
Human activity threatens the preservation ecological biodiversity in many ways. The deterioration of diversity found in nature is called biodiversity loss.

When the climate becomes warmer and habitats become fragmented, unbalanced and polluted, nature's ability to sustain ecological processes and the functioning of ecosystems become weaker. At the same time, some species become endangered or may disappear altogether.

Species depend on diverse ecosystems. The loss of species and ecosystems can lead indirectly to a deterioration of people's livelihoods, food supply and health. The loss of species can also lead to a loss of genetic diversity, which in turn will impair nature's ability to adapt to climate change and diseases.

Climate change and the loss of biodiversity are often interlinked. An example of this is deforestation, which results in large amounts of carbon dioxide being released into the atmosphere, which then contributes to global warming.

From the perspective of biodiversity, it is essential to address the above mentioned root causes of loss of biodiversity.



Direct threats to biodiversity in Finland



Land use and its change

As a result of construction and the environmental load it creates, habitats are reduced, weakened and isolated from each other.



Agriculture and forestry

Forestry makes habitats unbalanced, which is why species are at risk of becoming endangered. Emissions from agriculture into waterways deteriorate aquatic habitats.



Climate change

Rising temperatures, droughts, increased heavy rain and storms, and milder winters are changing habitats. Not all species might be able adapt to climate change or spread to new habitats.



Invasive species

Invasive species are ousting indigenous species from their habitats. Invasive species can affect the functioning of the entire ecosystem and change the structure of entire food chains.

Nature benefits and nature-based solutions

Biodiversity enables many of the natural benefits that are important to humans, i.e. ecosystem services that maintain our well-being.

Nature areas provide space for being physically active, recovering from daily life and observing the environment. Urban green improves the comfort of the local environment and promotes health. It prevents stormwater floods and acts as a buffer

against environmental disturbances, such as the spreading of invasive species and harmful substances spilling into waterways. The green structure produces, among other things, clean water, food and energy. All of these nature benefits are dependant on biodiversity.

In a growing city, nature and its diversity can be increased through actions such as proper management of green areas. This is supported by

nature-based solutions. They are based on the processes of ecosystems and nature that act as a starting point for human activities. Nature-based solutions produce several different nature benefits. This is particularly important in an increasingly densely built urban structure, where urban green must serve a wide range of activities and objectives. Through nature-based solutions, we can promote not only biodiversity but also things such as residents' well-being, comfort and adaptation to climate change.

Stormwater structures **prevent stormwater** flooding and improve water quality.

Vegetation **absorbs air pollution** and carbon dioxide, and retains rainwater.

Plants in yards, parks, and gardens attract **pollinators**.

Parks and local forests are places **for recreation and relaxation**.

Street trees, plantations and parks **create comfort**.

Parks, forests and trees **cool the microclimate** and provide shade.



