

Biodiversity at Catena

- A guide to measuring and maintaining eco-efficient areas



CATENA

Biodiversity at Catena

In 2022, Catena adopted the following sustainability target in its business plan: “By 2030, our entire portfolio aims to be net positive in terms of biodiversity”. With this goal, Catena expects to be able to show a more positive than negative impact on biodiversity across all properties by 2030.

To measure progress towards achieving our goal, we use a green area factor (GAF) calculation. The GAF is a planning tool that quantifies the amount and quality of green elements to help ensure sustainable development during construction. It indicates the proportion of green areas to impervious surfaces within a property or location. Green areas can be permeable surfaces like lawns or green roofs. To qualify as a green area, the space can also be covered by trees, shrubs or other plants. Besides measuring progress using GAF calculations, Catena also looks at which ecosystem services are being delivered. Ecosystem services are the direct and indirect contributions that ecosystems have on human well-being.

Thanks to the GAF calculations, Catena can plan to add and preserve green spaces and biodiversity in the early design and construction process. For existing properties, a GAF calculation was made on 31 December 2021, which was used as a base value. After measures are carried out, an additional GAF calculation is made to demonstrate progress towards our goal in a transparent way. In addition to the company’s own experts, outside ecologists and landscape architects are also engaged in order to carry out a well-founded investigation and to help with the identification of appropriate measures. A nature value inventory according to Swedish standards is always carried out before any measures are introduced at our properties.



Outdoor area with plant installations at Plantehuset 3 in Helsingborg.

Biodiversity and biological diversity are two terms that can be used interchangeably, and refer to the richness of variation that exists among living organisms and in natural environments. Biodiversity encompasses the diversity within species and the diversity of the ecosystems and habitats they create together. Biodiversity and ecosystems are closely linked to climate change, emissions, changes in land use, changes in the use of marine resources and direct development of surfaces, as well as the introduction of invasive species. As the climate changes, we will see greater fluctuations in the climate and an increase in extreme weather, creating a more challenging environment for both people and for nature. This can mean more precipitation in winter, milder winters, hotter and drier summers, heat waves, more intense storms and rainstorms, and an increased risk of flooding.

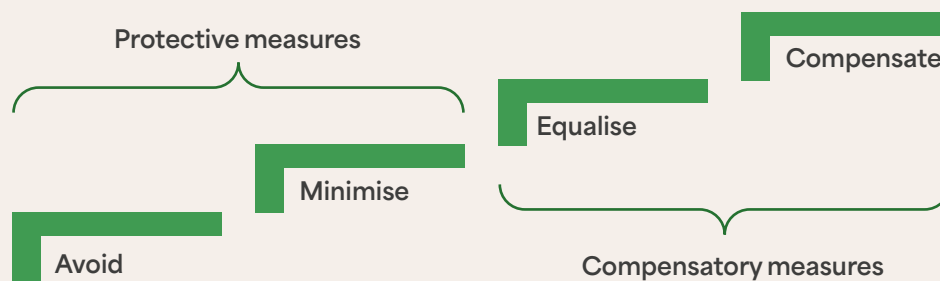
Our changing climate is putting all living organisms under pressure. That's why any company in a sector that drives land-use changes and takes up large areas of land must act responsibly, credibly and

transparently. Catena strives to increase the natural value of existing properties and has a stated goal of leaving the environment in a measurably better condition than it was before. When we begin to develop new areas, we strive to both preserve some of the land and make an effort to enhance biodiversity at the property as a whole.

In many cases, new logistics hubs are built on raw land or agricultural land in close proximity to transport routes. The geographical location ensures short, efficient transport flows. Yet this can pose a problem, since these locations can contain natural value that should be preserved in order to protect biodiversity. Catena tries to prioritise the development of locations with lower natural value and locations designated by municipalities as business development areas in their master and zoning plans.

Catena's biodiversity efforts follow the damage mitigation hierarchy, which is based on preservation, damage minimisation, restoration and, and as a last resort, compensation.

Damage mitigation hierarchy



Invasive species

Invasive non-native species are increasing every year, posing a major threat to biodiversity and ecosystems worldwide. Their rapid spread can damage ecosystems and infrastructure, as well as entail economic costs. As a property owner, Catena has an obligation to combat these species at our properties in a way that prevents such species from spreading any further in nature.

We follow Swedish Environmental Protection Agency recommendations, which include quickly removing the species as soon as they are detected, handling any waste carefully to prevent further spread and cooperating with neighbouring properties if necessary. Improper handling can exacerbate the situation, especially in locations with exposed soil. Therefore, careful planning and implementation of measures are crucial, especially during the construction process.

Source: naturvardsverket.se/amnesomraden/invasiva-frammande-arter/

The GAF and Sustainable Development Goals

Green spaces have positive effects on human health, enable ecosystem services and enhance biodiversity, which in turn creates better opportunities for managing developed properties with regard to noise, stormwater, and air and water quality. In addition, ecosystem services help to mitigate the effects of a changing climate and thus serve as vital tools for future-proofing our properties over time.

Of the UN's 17 Sustainable Development Goals (SDGs), the following goals are addressed in the planning and development of Catena's properties:

- 3. Good health and well-being
- 11. Sustainable cities and communities
- 13. Climate action
- 15. Life on land

The GAF touches upon all of these goals, with a particular focus on SDGs 13 and 15.



Bees and biodiversity

Research on the interaction between wild bees and domestic bees is not entirely conclusive. However, indications suggest that a high density of domestic bees can have a negative impact on the wild bee population. This is because domestic bees compete with wild bees for resources like pollen and nectar. Competition varies depending on several factors: the species of wild bees present in the area, their population size, the availability of food and the domestic bee density.

To make sure we are doing the right thing, we always consult with ecologists for guidance concerning each property before taking action. A nature value inventory according to Swedish standards identifies the geographical regions in the landscape that can benefit biodiversity and, where appropriate, honeybee hives can be introduced. We also introduce other measures to support wild bees, such as establishing bee hotels, creating sand pits for their nests and other similar measures.



The GAF tool

The GAF is a tool for managing biodiversity, ecological and social values and climate adaptation at properties.

The GAF was developed in the 1990s in Germany. In Sweden, Malmö Municipality was the first to apply the model when planning its 'BO01' development. The model introduces the concept of an eco-efficient area, which is measured by dividing the total ecological value of the area by the total site area to arrive at a factor of the proportion of eco-efficient areas. GAF calculations are a commonly used tool for urban planning and are used by Sweden's municipalities and other organisations. The City of Stockholm, the City of Malmö and the City of Gothenburg all have their own versions of the tool.

Different requirements are set for different types of developments. The enhanced Swedish model is based on sub-factors for vegetation cover (green areas), water (blue areas) and impervious surfaces (roofs, asphalt, etc., which are categorised under

blue areas). Add-on factors, such as for stormwater management and greenery, are then added to each sub-factor. Examples of add-on factors are trees and shrubs. To achieve a good balance between green and blue areas, a balance between ecological and social values is also considered.

GAF is measured as a ratio of the proportion of eco-efficient areas to the property's total site area. Eco-efficient areas consist of all green and blue areas. Add-on factors contribute additional points, where different types of stormwater management, trees, shrubs and other greenery are awarded different types of points.

Catena has chosen to use GAF calculations because it is a familiar tool already used by ecologists and landscape architects and because the systematics are clear and transparent.



Preserved older trees at
Plantehuset 3 in Helsingborg.

Calculating GAF

GAF is measured as a ratio of the proportion of eco-efficient areas to the property's total site area. Eco-efficient areas include all green and blue areas that have a positive impact on the area's ecosystem and help to improve micro-climates, stormwater management and noise reduction, as well as deliver social values linked to greenery, water or both. The calculation is made by multiplying the surface area of the sub-factors and the add-on factors by their respective weighting factors. The total of all points is divided by the property's entire area, resulting in the green area factor.

$$\text{GAF} = \frac{\text{eco-efficient area}}{\text{entire area of property}}$$

Sub-factors and add-on factors

Sub-factors are necessary for obtaining a GAF score, since they describe the type of area a property consists of. They are grouped into sub-factors for greenery and water, respectively.

Add-on factors are added for specific measures and relevant functions. The area must first have been assigned a sub-factor in order to receive an add-on factor point. Add-on factors are converted into surface areas.

Add-on factors are awarded when greenery and water are used in a way that generates positive effects for biodiversity and climate adaptation. This means that some measures make a positive contribution that earns points multiple times. For example, a green area can be awarded points both for being a meadow or preserved natural area and also for

containing flower beds, trees or shrubs. In this way, more contributions can be made to multiple ecosystem services.

Ecosystem services

Ecosystem services and GAF scores are updated automatically according to the template. This means that the final result of the GAF calculation, when sub-factors and add-on factors are entered, also generates x-number of ecosystem services. Thus, a value for ecosystem services is not something we calculate ourselves.

Assessing and weighting the factors

The sub-factors and add-on factors are assessed and given a weighting according to the GAF calculation model.

The sub-factors and add-on factors are assigned different points and are weighted according to quantifiable values linked to biodiversity, ecology, climate, water management and ecosystem services.

The factors are weighted according to different principles. For example, even small elements can be given high points in the model. Deeply planted vegetation, trees and available water increase the chances of achieving resilient biodiversity. Preserving the natural environment, especially the original trees in a location, is the best measure, since we can then support and preserve existing biodiversity and ecosystem services. Furthermore, there is an opportunity to create more robust measures for different habitats that make a positive contribution to the area's ecological infrastructure. This is often the starting point for a property that is already developed.

How are the points valued?

According to the GAF calculation model, different inputs are awarded different numbers of points. This makes it easy to compare different initiatives at an early stage and clearly understand what can make the greatest impact on biodiversity.

For example, existing, preserved older trees yield an add-on factor of 3.2 points each, while a butterfly bed yields 1 point/m². Newly planted trees can yield a factor of between 0.4-2.8 points, depending on their type and size.

Adding a permanent pond to the property creates huge benefits for plants and animals, and yields an add-on factor of 4 points/m². The sub-factor asphalt and other impervious surfaces yields 0 points/m², while meadows and other planting areas can yield up to 1.6 points/m².

Ecosystem services

Nature and its ecosystems support all life on earth. For more than 600 million years, nature and ecosystem services have paved the way for human existence. Thanks to the interplay between plants, animals and other living organisms, we have been able to meet our needs, to grow food, to hunt, to build communities from natural materials and to simply enjoy the shade underneath a tree. And, in parallel, all green plants and trees perform photosynthesis - something our lives depend on. Ecosystems and biodiversity create both blue and green infrastructure that forms the foundation of all life on earth.

In cities and towns, plants and animals provide communities with a variety of products and services.

Plants provide us with oxygen, food and building materials, and they protect us from extreme weather. Bees and other insects pollinate our crops. Wetlands and green spaces purify rainwater and snow water, removing heavy metals and other harmful substances. Worms and micro-organisms break down plant and animal material to make our soils fertile and nutrient-rich. All these benefits that nature provides us with - and many more - are called ecosystem services.

Ecosystem services are usually divided into supporting, regulating, provisioning and cultural services. Excerpt from Boverket as below.

Source: boverket.se/sv/PBL-kunskapsbanken/teman/ekosystemtjanster/det_har/typer/



Supporting

Supporting ecosystem services are necessary in order for all other types of ecosystem services to function and include biodiversity, soil formation and the production of oxygen via photosynthesis by plants, as well as nutrient and water cycles and the formation of different habitats for plants and animals. They are the 'contract suppliers' of ecosystems.



Regulating

Regulating ecosystem services are more specific benefits provided by natural systems. This group includes all the services produced through nature's own regulation of critical processes, such as purifying the air and water, regulating local and global climates, preventing flooding and soil erosion and pollinating crops and wild plants.



Provisioning

Provisioning ecosystem services are tangible benefits that people gain as a direct result of nature's work. Examples include the food we get from plants and animals, fresh water, renewable fuels and genetic materials. They all make up our resource base.



Cultural

Cultural services are all the non-material benefits that nature provides. Examples include different spiritual values related to the natural environment, the importance of nature for human health and cognitive development, and recreational and aesthetic values.

Source: The National Board of Housing, Building and Planning, together with the Swedish Environmental Protection Agency and the association C/O City, have produced icons and illustrations about ecosystem services that are free for anyone to use. The icons and manual can be found in 'Related Information'.

Illustrations: The New Division, National Board of Housing, Building and Planning.

Sub-factors for greenery

Preserved natural land - can consist of natural pastures and meadows, forests and rocky areas, trees and shrubs and rocky outcrops, as well as other elements that help to maintain green structures. The conditions must be in place for good drainage, roots must be able to develop and withstand increased wear and tear and the soil must be able to develop over the long term.

Natural garden bed - a garden bed must have sufficient soil depth to enable vegetation to grow. Meadows, agricultural land and planted areas fall under this category. Have been affected by fertilisation, liming, soil preparation or drainage, for example.

Garden bed on floor joists >600 mm deep - floor joists are wooden structural parts of a building that can be used to support layers of soil. Different sub-factors depending on the depth of the bed.

Roof garden with bed >600 mm deep - different sub-factors depending on the depth of the bed.

Green walls with plants - plant-clad walls and vertical greenery, such as flowering, self-clinging and climbing plants.



One of three kestrel nesting boxes installed at Plantehuset 3 in Helsingborg.

Add-on factors for greenery

Field layer

- Biodiversity in the field layer - can consist of moss, grass or sedum plants, and can be found on roofs and at ground level. Varied field flora with several species. Flowering field vegetation is important for pollinators and botanical diversity, and it binds soil, which is useful during both extreme rainfall and drought.
- Butterfly bed - bedding that contains perennials, herbs and spices in order to attract butterflies and other insects.

Biodiversity, shrub layer

- Shrubs - multi-layered vegetation, with shrubs that support biodiversity, a cooling effect and absorption of carbon dioxide.

Biodiversity, vertical greenery

- Greenery on walls, fences, trellises, pergolas, etc. - area calculated by how much of the wall is expected to be covered within 5 years. Self-clinging, climbing plants. These support micro-climates, counteract the effects of heat, have a noise-reducing effect and function as a water and air purifier.

Biodiversity and recreational features

- Nesting boxes, beehives, fauna depots, etc. - habitats for birds, insects, mosses, lichens, fungi, etc.
- Habitat-enhancing biotopes - measures for frogs, wintering environments, wild bees, etc.

Recreational values

- Spaces for social activity, such as outdoor gyms and outdoor areas, should offer both sun and leafy shade.
- Cultivation areas - cultivation at ground level or in raised beds.
- Shrubs with edible berries and fruits - flower- and berry-bearing shrubs.

Local temperature control

- Trees, pergolas, leafy paths, etc. that provide leafy shade - provide a cooling effect and shade, and should cover 40% of the area where people spend their time.

Sub-factors for water

Stormwater should, as far as possible, be managed and diverted, purified and recirculated back to the natural cycle within the neighbourhood block.

Water surfaces in ponds, streams and ditches – stormwater should, as far as possible, be managed and diverted in the immediate environment and create a local cycle with ponds, ditches, reservoirs, etc. Extreme rainfall must also be managed. Refers to all water surfaces that hold water for most of the year.

Ground covers with high permeability (lawns, etc.) Mowed lawns do not add any biological value but provide high permeability for water and stormwater that is filtered into the ground, purified and reduces the risk of flooding at the site when it rains.

Ground covers with moderate permeability – areas with moderate water permeability. Examples: open asphalt, gravel, shingle and sand.

Ground covers with low permeability – areas with low water permeability. Examples: concrete slabs, paving stones and clinker.

Impermeable surfaces – surfaces that do not filter any water at all. Examples: asphalt, concrete and a building's roof surface.

Add-on factors for water

Biodiversity, water

- Biologically available, permanent water surfaces – All ponds or water surfaces that hold water year round fall under this category. Can be landscaped or natural. Permanent water surfaces support a richer animal life (insects, birds, amphibians, etc.).
- Vegetation areas that temporarily store water – such as dry ponds and detention ponds that retain water during spring or autumn.
- Ditches – a ditch is a landscaped feature intended to drain excess water.
- Dewatering of impervious surfaces for plant beds and rain gardens – planted areas that are installed to retain and purify stormwater near streets, parking lots and buildings.

Recreational values

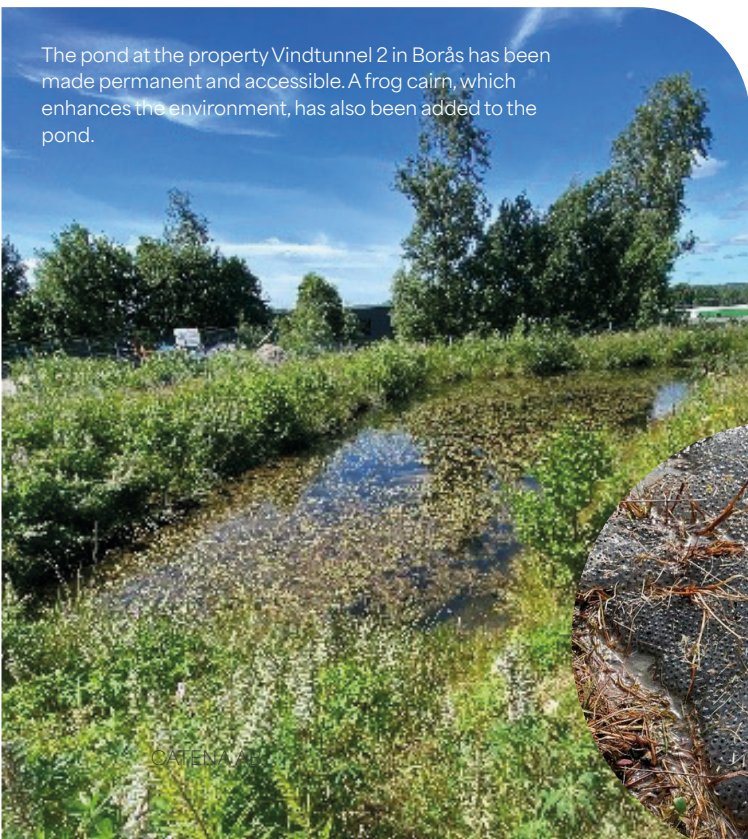
- Fountains, circulation systems and similar – the circulation of water promotes oxygenation and reduces the risk of algae formation. Higher humidity and the sound of water promote both a real and a perceived cooling effect during the summer.

Control of local temperature and water

Due to climate change, there is an increasing risk of more frequent and longer-lasting heat waves in the summer. Water helps to equalise the temperature, lowering the air temperature during the summer. Prolonged drought has a negative impact on people, vegetation and wildlife.

- Pools of water in ponds and similar – smaller ponds that people spend time at.
- Rainwater harvesting for irrigation Stormwater collection for irrigation or reuse in some form.
- Stormwater retention from impervious surfaces in reservoirs – stormwater from dense, paved surfaces collected in reservoirs where water cannot be utilised by the vegetation.

The pond at the property Vindtunnel 2 in Borås has been made permanent and accessible. A frog cairn, which enhances the environment, has also been added to the pond.



Checklists

Below are checklists with questions to ask for different types of projects.

Newly constructed buildings

1. What does the environment look like?

A consulting ecologist takes an inventory of the property. Based on the ecology report, what are the most important things to preserve?

2. What can we do to preserve as many existing trees and woodlands as possible? What other vital habitats do we want to preserve?

- How many trees can be preserved at their original site?
- Remaining trees - can we store them and then replant them?
- Where can we create a micro-forest on the property?
- Challenge ourselves to reduce the impervious surfaces through positive dialogue with the tenant. Have we succeeded in negotiating the removal of an impervious surface in the project? Or reducing it?

3. Are natural water surfaces present?

- What can we do to preserve natural water surfaces? Can we ensure that the pond becomes permanent (for example, as part of the stormwater management?)
- Is it appropriate to create a water surface at the property to promote biodiversity and stormwater management?

4. How can we further increase biodiversity at the property based on existing conditions?

- Where can we plant butterfly and bumblebee beds?
- Where and how can we create habitats for butterflies, insects and bees? (bee hotels, sand pits, stone walls).
- If trees can't be planted, in which areas can we plant shrubs and create meadows?
- Can we install vertical green walls? This is an issue that concerns both the building as a whole, as well as sprinkler tanks and other features at the property.

Existing properties

1. What does the environment look like?

A consulting ecologist takes an inventory of the property.

2. Based on the ecology report, what are the most important areas to preserve and make more robust? How can we connect the environment at the property with its surroundings?

3. How many trees can we plant on the property?

- Where can we create a micro-forest at the property?

4. Are natural water surfaces present?

- What can we do to preserve natural water surfaces? Can we ensure that ponds are permanent (as part of stormwater management, for example?)
- Is it appropriate to create a water surface at the property to promote biodiversity and stormwater management?

5. Can we reduce impervious surfaces?

- Ensure this through positive dialogue with the tenant. Have we succeeded in negotiating the removal of an impervious surface in the project? Or reducing it?

6. Supplement - How can we further increase biodiversity at the property based on existing conditions?

- Where can we plant butterfly and bumblebee beds?
- Where and how can we create habitats for butterflies, insects and bees? (bee hotels, sand pits, stone walls).
- To increase biodiversity even more, we want to plant trees as much as possible. But, if this doesn't work for some reason, we'd like to have shrubs and meadows. So, which areas can we plant shrubs and meadows on?
- Can we install vertical green walls? This is an issue that concerns both the building as a whole, as well as sprinkler tanks and other features at the property.

CATENA

Catena is a listed property company that sustainably develops and durably manages efficient logistics facilities through collaboration. Its strategically located properties supply the Scandinavian metropolitan areas and are adapted for both current and future flows of goods. The overarching objective is to generate strong cash flow from operating activities to enable sustainable growth and stable returns.

Catena shares are traded on NASDAQ Stockholm, Large Cap.



Exceeding expectations

We behave professionally in everything we do, large or small, and have the skills needed to meet current and future needs. Based on this, we always go a little further, daring to be innovative.



Taking long-term responsibility

Both our own workplace environment and the broader society are affected by how we act and the decisions we make. What we deliver must be sustainable and sustained - environmentally, socially and economically.



Being committed

We work closely with our customers and our colleagues and we are passionate about what we do. At Catena, we believe in having fun at work and aren't afraid of this joy being contagious



catena.se