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PLAYGROUNDS - PLACES WHERE BOTH CHILDREN AND NATURE THRIVE

Is it possible to combine children's need for contact with nature with the needs of different species in the animal and plant kingdom so that the result is both a sustainable playground and a sustainable habitat with high biodiversity?

Fredrika Mårtensson, Anna Litsmark, Björn Wiström & Marcus Hedblom

The sustainable playground

Children are fascinated by what lives and moves in nature. Highly biodiverse environments stimulate play and contribute to social and ecological sustainability.

We live in the Anthropocene, an era in which human activity is depleting ecological systems and affecting the climate. It is increasingly urgent to find solutions that favour our human needs while respecting the planet's limits.

Today, a multifunctional use of land is favoured, actively seeking to resolve conflicting objectives and find synergies between different interests. The goal is sustainable land use that protects, develops and creates new biodiversity-rich ecosystems that contribute to the well-being of humans and other species.

Documented health effects

For many years, researchers at SLU have documented the health effects of children's access to green and varied outdoor environments and have developed a biotope-oriented design modelled on natural and cultural landscapes. What is new now is that environmental psychological and biotope-oriented perspectives are combined so that a transition to nature-based play environments will be possible. The aim is to create a more nature-based and process-orientated planning, design and management based on the question: How can children's need for nature contact and the needs of other species in the animal and plant kingdom be combined in children's outdoor environments?

Children's access to nature in their daily lives is important for their development and health in both the short and long term. Nature's so-called environmental offerings turn into play and lead to health-promoting physical activity. Concentration and sleep are also improved. Green environments stimulate children's imagination, problem solving and contribute to a good social climate in groups of children.

Artificial materials

Today, paradoxically, artificial materials such as play structures, fences and rubber mats are increasing in children's outdoor environments. These become artificial places that create distance between children and nature. In *Plats för lek,* SLU researcher Märit Jansson (2016) instead highlights the 'sustainable playground' as an ideal, a place that relies heavily on the natural conditions and natural materials of the site.

How good different types of nature-based playgrounds are at creating encounters between children and nature remains to be investigated. Many so-called nature-like play environments involve nature with little biodiversity.

Is it possible to preserve and develop complex ecological systems with high biodiversity into everyday environments for children? To what extent can we achieve a more generalised transformation of children's outdoor environments so that they function more on nature's terms?

Key arenas

Children's outdoor environments are important arenas for their physical activity and must be able to withstand their play and movement. This assumes that the area is large enough and the vegetation is robust. But beyond physical activity, there are many other aspects of children's relationship with nature that are important. This is
a biodiverse landscape can offer in terms of variety, detail and complexity.

Natural phenomena fascinate children, what is alive and moving becomes interesting and where children feel safe they also want to explore their surroundings. The complexity of nature invites situations where children can use their entire range of meaning-making through their bodies, senses and movements, while stimulating their imagination. In her dissertation *Landskapet i leken* (*Landscape in Play),* Fredrika Mårtensson (2004) writes about children's 'place-related pleasurable movement', where play emerges from children's physical exploration of their surroundings and creates a relationship between places that contributes to the adventure of play.

Developing their care

Approaching nature with all their senses creates different situations where children can develop their care for nature and its inhabitants. Children's playful approach to the environment is their entry point to nature and this encounter can develop into a more lasting relationship. A tree, a plant or an animal can become a central individual in a child's life. However, lasting relationships between children and nature do not occur in all types of outdoor environments, but require a place. This is where the concept of the lekotop comes in.

Environmental offers is a concept used to describe children's encounters with the physical environment and what it can attract in their play. In this perspective, natural elements are exchanged with play equipment and other artefacts.

Lekotop, on the other hand, is an expression that refers to ecological concepts and emphasises the potential of nature as a play environment.

Space for play

Biotope is derived from the Greek words bios (life) and topos (place) and indicates a physical entity that provides habitat for a specific set of plants and animals. A lekotope becomes a 'place for play' if it is also a functioning habitat. for other organisms. Children playing and learning in such an outdoor environment are then part of an ecological system.

The concept of lekotop is used here as a pedagogical approach in the design of more nature-based play environments. It serves as a metaphor when starting from local natural environments.

conditions and takes nature as an inspiration for its work. The design also systematically tries to incorporate knowledge of ecological systems to create more interesting places and increase biodiversity. With playotopes, the ambition is to create places for play that meet children's needs on nature's terms.

Children like to climb around in tree tops. In Klätterbrynet in Alnarp's landscape laboratory, they have ensured that children get up into the trees by favouring the growth of branches at ground level. Photo: Lars Brundin

Play on nature's terms

Lekotopes are created in landscapes that favour children's play and movement, while at the same time promoting nature conservation.

Ingunn Fjørtoft, a researcher in sports science, has studied how useful the natural environment is for children's motor activity and development. In her research, the playground concept is based on a landscape ecology perspective that focuses on how landscapes and ecological systems develop in relation to different populations of species over time and space.

This approach emphasises the structure and composition of the landscape, paying attention to patterns of change and progression. Children's activity in a place is one layer of processes in such a description. A play biotope are the specific vegetation and terrain features conditions of different shape, density, size and variety that create the conditions for a specific type of play context.

Play in natural areas

Within a particular biotope, such as a meadow or a forest edge, there are different habitats where a particular species has access to the resources it needs to survive. Within a habitat there are niches, i.e. places with specific functions for a species linked to, for example, temperature, food availability and vegetation. This
Fjørtoft applies this terminology to research data on how children use natural areas during play.

She describes how a tree biotope contains niches for huts and climbing, how a shrub biotope contains niches for hide-and-seek and huts, and how formations of trees and shrubs and the character of a place form habitats for specific games.

A site with a shrub and tree layer and modest terrain differences is described as a habitat for both hide-and-seek and role-play while

Children's play and movement take place in the dynamics between different spaces and across landscaped pathways. Straight rows and sharp boundaries between different materials facilitate competition between children. Photo: Lars

Brundin

a place where there is plenty of pine and cones becomes a habitat for cone throwing.

Routes for movement

Fjørtoft also shows how different configurations in vegetation and topography are given a signalling value in the
A straight shrubbery along an open plain becomes a barrier to play, while a more diffuse and curved border makes it easier for children to cross a boundary between two different types of vegetation.

Together with children and nature conservationists, Fjørtoft and her colleagues are also investigating how the design of movement-rich play environments can be made compatible with the requirements of nature conservation. i
In the construction of a schoolyard biotope in Japan from 2002 to 2014, overlapping layers of habitats for play, learning, water management and vegetation were designed in plan maps of the school environment in order to link the different habitats and create new dispersal corridors for flora and fauna.

The aim was that overlaps between the different functions for children, animals and plants would contribute to an ecological complexity that favoured children's learning and the play value of the site. The researchers were able to count 186 different play functions in the restored schoolyard environment.

The example also demonstrated the challenges of developing a play environment with conservation ambitions.
Organisms in a playground may need corridors to similar habitats nearby that are not accessible to children.

There can also be concrete conflicts between children and nature. On a small island in a river with duck and heron, jumping out to the island became an exciting game and gradually the grass was torn down and the animals disappeared. The children were upset and in discussions among themselves came to the decision that the island should not be entered. The grass grew back and the birds and many other animals returned. This shows how a culture of play with sensitivity to the conditions of nature can arise where children have the chance to experience nature in a way that arouses their interest and commitment.

Nature is rich in loose material and forms the backbone of children's play. Decaying logs are important for wildlife and are so light in weight that even the youngest children can move them. Photo: Lars Brundin

Meeting between play and landscape

In a collaboration between the landscape architecture office Ur bio, Örebro municipality and researchers, practical and conceptual development work on playgrounds is underway.

The development of playotopes is presented in a guideline entitled *Playotopes, play value in nature-like green play landscapes*. It uses the concept of playotopes as part of a strategy to create richer play environments, shifting the focus from ready-made play equipment with a focus on motor training to the encounter between play and landscape.

The starting point is the landscape architect's understanding of the flow and multidimensional nature of play. Children create places to explore, experiment and create and seek environments to process and imaginatively stage different situations.

The crowded role of outdoor play in children's daily lives requires clear, perhaps even overly clear, invitations to play addressed to the adults who decide when, where and how children can play. This requires not only a playground that signals that children are welcome, but also more specific invitations to play.
design features that make the place work in the children's social life.

Many challenges

The lack of loose materials and clear spatialities in play environments is problematised. The goal is nature-based play environments with many challenges and a permissive character, but the implications of different choices in terms of ecosystem services are also considered.

The starting point in the work on a playground is the unique conditions of the site where the possibilities of nature serve as inspiration and guidance. The project describes the way in which nature provides children with rich sensory experiences and materials that can be used in play. Working with overarching structures of earth and stone and vegetation as space-creating elements is central to the approach. Various artefacts linked to a theme can be used to enhance the play value,

such as buckets and a pump by a stream, but also art and features such as insect hotels.

Formulation of play value

In this context, a play area is an interface between children and place applied to concrete sections of landscape where the play values of the place are formulated. The guidance material includes play areas for forest landscapes such as Sprin- gosen, Leksnåret and Pinnskogen and for water landscapes such as Lekbäcken, Stenströmmen and Lekdammen. Seven different principles have been developed for the design of a playground (see fact box on page 8).

At SLU, attempts are being made to further develop the concept of playfulness in order to nuance the question of what common interests exist between children's need for contact with nature and the needs of species in the animal and plant kingdom and how they can be combined.

Landscaped plantings

Work on playotopes is carried out on school playgrounds, in public play environments and in Alnarp's landscape laboratory. In schoolyards, plantings have been created to support play during breaks and lessons. At playgrounds in Örebro, various prototypes for playgrounds are being tested by landscape architects and municipal planners in dialogue with researchers in vegetation management, environmental psychology, ecology and interaction design.

An important detail is that the fine-tuning of the design takes place on site in dialogue between designers, builders and various constellations of experts. A group of children have also tried out the site during the process.

Locations are being studied

A landscape laboratory is a place of experimentation where more complex questions about how the outdoor environment is used, designed and managed can be investigated. It requires observations of processes over a long period of time.

Relationships within and between different locations in the lab are studied as conditions for different species. In parallel, the functioning of the environment for visiting children is also studied. The development work is aimed at strengthening the capacity of the natural area to support

children's play and learning with a focus on nature values, biodiversity and ecological adaptation.

The work with playgrounds is part of a number of different attempts to incorporate nature into children's everyday lives in order to make interesting encounters with nature possible. The vegetation in children's immediate environment is often impoverished, species-poor and lacks contact with the surrounding landscape. It is easy to think that playground equipment and other "visual candy" is the solution for activating children in such a situation.

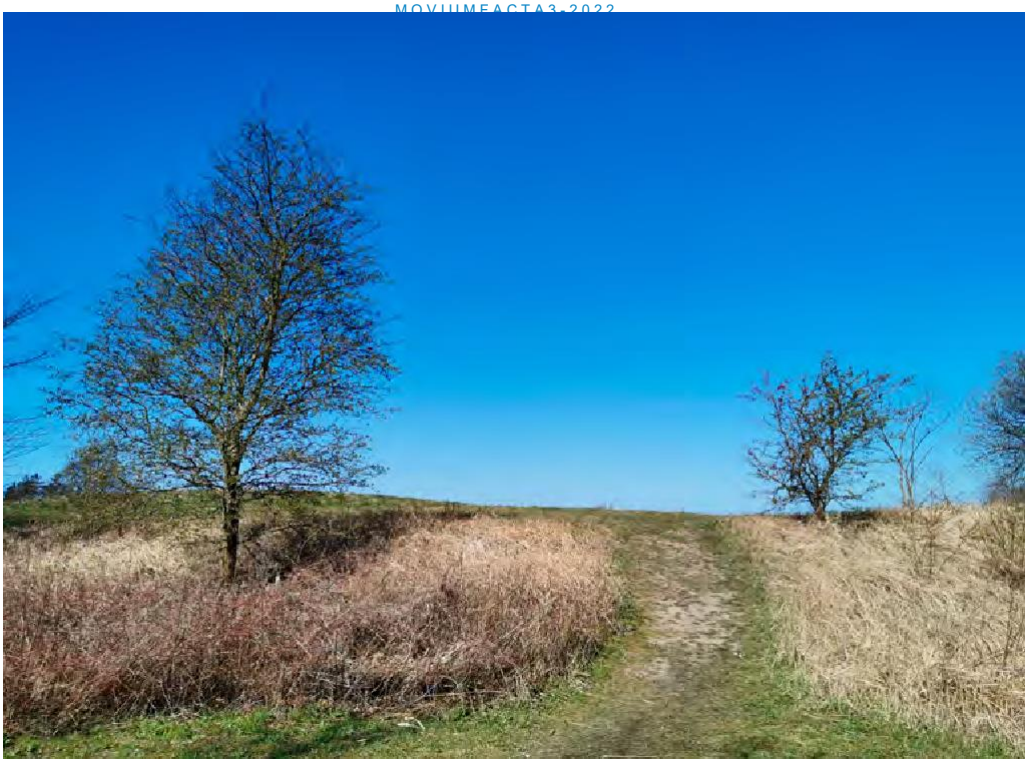
Inviting play

The risk is that nature's expression is drowned out and children's play becomes repetitive. The challenge is to plan, develop and manage places that invite play without artificial artefacts taking over. With playotopes, the aim is to start from nature and build on children's opportunities for play.

interesting encounters with landscapes, plants, animals and other natural phenomena in a place.

The implementation of nature-based play environments on a larger scale raises a number of questions about their creation, design and management that have no simple answers and require modifications to working practices. This may involve identifying sites with nature that may be suitable as play environments, utilising, developing and managing the natural qualities that sites already have, or working more experimentally with the complexity of nature and the needs of children to create new types of play habitats.

The ambition is to create play biotopes with play habitats that contain many different niches for children's play and activity and good living conditions for animals and plants. A playground should be as obvious a concept in urban development as a playground has traditionally been.



Landscape in play: Here children can rush up to see what's beyond the hill. Opportunities to move towards more unfamiliar surroundings make outdoor play an adventure. Photo: Anna Litsmark

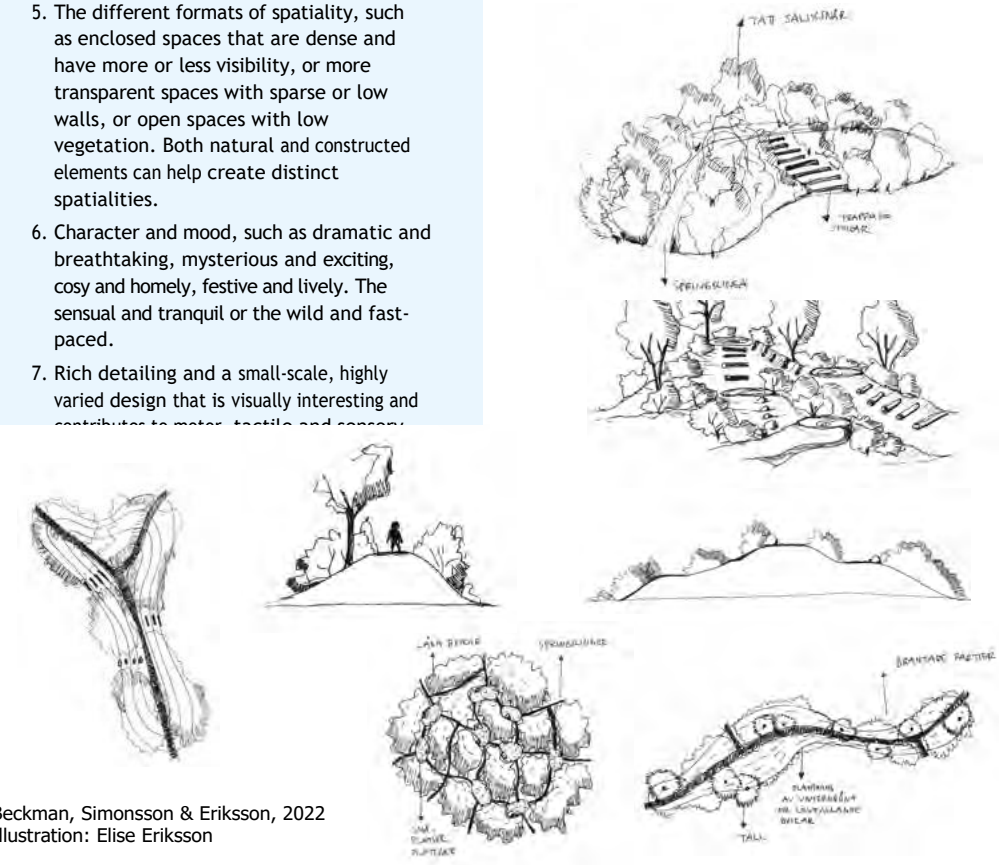
Fact box

Seven things to keep in mind when developing playgrounds

1. Landscape elements such as rock, terrain, soil and water form a variety of open spaces and topography with valleys and ridges.
2. Spatial elements are mainly natural, such as shrubs and trees that create smaller rooms, with walls and roofs, and add character with their branches and foliage. Boulders and logs also contribute.
3. Natural materials such as water, sand, clay and gravel and vegetation such as leaves, sticks, flowers, berries, cones, nuts and fruits. Loose materials that allow for co-creation.
4. Play enhancers are playground equipment such as swings, canoes, playhouses, water chutes and pumps, as well as artwork and elements such as insect hotels and dead wood. Buckets and shovels also contribute.
5. The different formats of spatiality, such as enclosed spaces that are dense and have more or less visibility, or more transparent spaces with sparse or low walls, or open spaces with low vegetation. Both natural and constructed elements can help create distinct spatialities.
6. Character and mood, such as dramatic and breathtaking, mysterious and exciting, cosy and homely, festive and lively. The sensual and tranquil or the wild and fast-paced.
7. Rich detailing and a small-scale, highly varied design that is visually interesting and contributes to meter, tactile and sensory

Design principles for the Springåsen playground

Springåsen is a concept that describes children's movement patterns in and around a collection of richly vegetated ridges with valleys in between. It is designed as a collection of undulating ridges that encourage running play and speed. By varying the height along the ridge and creating microtopography in the paths, the loop becomes exciting to move along. The running ridge varies in height and can have both steep and flat slopes. A slide is a great way to reinforce play values, as are climbing ropes or stairs. The density and height of the ridge's green spaces can be varied through the choice of vegetation. In some places, green spaces can be created for less fast-paced play - small crawl spaces. or larger reservoirs. The following are examples of the design of Springåsen with different types of topography, path density and spatialities.



Beckman, Simonsson & Eriksson, 2022
Illustration: Elise Eriksson

- Play biotope - an area with specific conditions that make it a place for many different types of play and activity, such as the climbing frame.
- Play habitat - a defined area where certain types of play tend to occur, such as the row of oak trees where children climb the trees together in imaginative play and conversation.
- Play niche - a space for a specific play activity, such as a specific tree with few branches where individual children can be undisturbed.

Figure: Anna Litsmark

Lekotop developed in landscape lab

At SLU, attempts are being made to further develop the playground concept in order to nuance the question of what common interests exist between children's need for contact with nature and the needs of species in the animal and plant kingdom and whether they can be combined.

In the north-eastern part of Alnarp's landscape laboratory at SLU, there is an area of rowan and oxel which, due to soil fatigue, poor growth and invasion of grass, never became the forest it was intended to be. Over time, the However, several shrubs and trees have emerged to form a semi-open grassy landscape with all kinds of shrubs such as roses, raspberries and hawthorn. In connection with this area, a small hill has been created with soil from the clearing of a nearby ditch. Here, pioneer species of willow dominate, but also a coarse herb layer that was dormant in the soil. Today, this "failed" vegetation construction is considered an important habitat for many insects.

To counteract the succession to a more enclosed woodland, the area has been repeatedly cleared. A network of mowed paths, intended as a maze for children, was created ten years ago and has been adapted over the years to the way people move through the area. Adjacent to the grassland is a row of oak trees surrounded by pioneer-like herbaceous vegetation. The low growth among the rowan and oak trees initially provided space for the oak to form low branches. Through thinning, pruning and clearing of neighbouring vegetation, the low branches on the crowns of the light-demanding oaks have been able to spread. Ropes in the oaks and colourful benches have been added.

Popular destination

The climbing area has become a popular destination for groups of children visiting the laboratory. With their long and low branches, the trees create a niche for children to climb, climb, swing and hang. The sturdy branches of the oak trees offer many challenges for children to test their balance, hanging and dangling, testing how far out on a branch they can climb, swinging up and down and climbing high.

in different levels in different directions attracts many children to climb at the same time. In trees with fewer branches, children sit on separate branches and can talk undisturbed. They can use the two ropes to cross from one tree to another.

On one side of the scramble, there is agricultural land, an open rectangular area, and beyond that
a train track where trains pass from time to time. Here is another very clear playful invitation. Children jump down from their trees to watch the train. They cover their ears or scream in excitement with their arms in the air when a train passes by.
Sometimes it turns into a running race along the edge of the field. A straight field edge, a straight row of trees and a fast train invite the children to compete. On the ground there are acorns, sticks, seashells, stones and a herbaceous layer of strawberries and teveronica - a niche for exploring, collecting, creating and meeting bugs.

Calm frame

On the other side of the row of trees is the semi-open grassland, which provides a small-scale, tranquil setting.

for climbing without shading the trees. It is an area that is not much used by the children.
We tried to crack the code of the dynamic course of play between different niches of activity in the area: Were there thorns keeping the children out? Is the place too crowded? To invite the children's play into the area, new paths were created from the edge of the small hill, some thorny bushes were removed, loose branches were gathered in piles, hints of huts were created as well as new climbing trees.

The row of trees itself constitutes a clear habitat of characterful individuals for the children with whom they seek contact, like to sit in and get to know with their bodies. The question now is which natural and play values can be combined in this semi-open scrub and grass landscape to form a play biotope. Is it possible to find guidance in earlier forms of management such as coppicing and woodland management?
use, a strategy combining a meadow corridor with alternating dense patches of shrubs and trees? The problem-solving on the spawning grounds continues.

In the climbing frame in Alnarp's landscape laboratory, it has been ensured that the oak trees have branches down to ground level so that children can climb up. Photo: Anna Litsmark

Klätterbrynet is a clear playground in Alnarp's landscape laboratory with different niches for play in different seasons. Some benches serve as a base for educational activities. Photo: Anna Litsmark

To further develop the playground, the area is being cleared, resulting in new paths, climbing trees and loose material. Here, from left, Fredrika Mårtensson, Björn Wiström and Jitka Lindén are working on the climbing frame. Photo: Anna Litsmark

Read more

Ito, K, Tomomi S, Fjøjrtoft I (2016) *Ecological design: Collaborative landscape Design with School children,* In, Ann Marie F. Murnaghan and Laura J. Shillington (eds.). *Children, Nature, Cities,* Chapter: Ecological design: Collaborative landscape design with school children, Routledge.

Fjørtoft, I (2012). *Children's play biotopes - a landscape ecological perspective on children's use of outdoor areas.* In Krogstad, A, Hansen GK, Høyland, K, Moser, T (Ed.) *Room for kindergarten. Multidisciplinary perspectives on kindergarten's physical environment*. Bergen: Vigmostad and Björke AS.

Jansson, M, Ahlklo, Å, Norén-Björn, E, Nolin, C, Bucht, E, Bodelius, S, Kristensson, E, Prellwitz, M, Berglund, U (2016). *Place for play - Swedish playgrounds past and present*. Svensk Byggtjänst.

Mårtensson, F, Johansson, M, Litsmark, A, Stroh, E, Thelin, L (2021). *Children's contact with animals in everyday life - a research-based synthesis.* Department of Human and Society, Swedish University of Agricultural Sciences. SLU Future One Health reports no 1.

Mårtensson, F, Litsmark A, Wiström, B, Hedblom, M & Ode Sang, Å (2021). *Utveckling av lekotoper för barns naturmöten*, Fakulteten för landskapetarkitektur, trädgårds- och växtproduktionsvetenskap, Sveriges Lantbruksuniversitet (Rapport 2021:2).

Beckman, M, Simonsson, E & Eriksson, E, (2022 digital publication). *Guidance Lekotopes - play value in nature-like green landscapes*. Urbio and Örebro municipality. The report can be downloaded from KTH's website Digitala och Fysiska Lekmiljöer, https://digifys.csc.kth.se/.

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Cover image

Photo: Lars Brundin

All photos are taken in the Alnarp landscape laboratory.

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