The Fyris River Walk

Follow the Fyris River from ancient times to the future – an educational walk through time and space along Uppsala's lifeline

Teacher's guide (autumn 2025)

UPPLANDS STIFTELSEN
NATURVÅRD & FRILUFTSLIV

LOkala NAturvårds satsningen

Uppsala kommun

UPPLANDSMUSEET

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BIOTOPIA

KUPP
Lärande för hållbar utveckling

SLU

Part 1 – The concept

Part 2 – The walk

Part 1 – The concept

Background

We live in a time of change, where society faces complex challenges and a growing need for transformation. Meeting these challenges requires young people with creativity, courage and the ability to see solutions from different perspectives – and to dare to implement them.

In 2015, the countries of the world adopted Agenda 2030 – a global action plan for sustainable development. The global goals are the most ambitious effort to date to end extreme poverty, reduce inequality and injustice, promote peace and justice, and tackle the climate crisis. By working towards these goals, we can create a more sustainable future together. (www.globalamalen.se)[1] .

The mission of upper secondary schools is to give students the tools to use their knowledge to formulate, analyse and test assumptions, and solve problems – both individually and in collaboration with others. Students should be able to reflect on their experiences, critically examine statements and alternatives for action, and feel confident in their own abilities. These skills are essential for them to contribute to sustainable development.

Sustainable development – using the Earth's resources without harming future generations.

1. **Ecological sustainability** – taking care of the Earth's nature and ecosystems so that they can exist for future generations.

2. **Social sustainability** – when individuals' needs for influence, security and freedom can be met.

3. **Economic sustainability** – economic development that does not have negative consequences for ecological or social sustainability.

[1] At www.globalamalen.se/skola/ , there is a selection of educational material, including "resources for teachers and students".

Learning for sustainable development (LSD) aims to educate citizens who feel involved in societal challenges and are committed to sustainable solutions (Sund & Sund, 2017). Research shows that students need to develop three skills that are particularly important for a successful transition:

- **Holism** – seeing the big picture and understanding one's own role in a larger context.
- **Pluralism** – recognising that there are several possible solutions and that different perspectives are needed.
- **Action competence** – having confidence in one's own ability and the courage to make decisions, both small and large.

The Swedish National Agency for Education has an ongoing initiative to spread knowledge about LHU and promote the exchange of experiences. Among other things, they have created a network with regular digital meetings and offer training in leading change work. More information is available at larportalen.skolverket.se.

A subject-integrated journey towards the future

Research shows that outdoor education, combined with physical activity and contact with nature, can have both direct and indirect positive effects on pupils' learning, school performance, health and well-being. It also contributes to their personal and social development (Faskunger et al., 2018). Outdoor education is often based on a methodology that promotes student influence, participation, reflection and creative expression (Szczepanski, 2008; Åkerblom, 2005).

To make future issues and sustainable development more concrete for upper secondary school students, Upplandsstiftelsen, in collaboration with the KUPP network, Biotopia, Uppland Museum, Uppsala Vatten and SLU, has developed an educational walking tour. It starts at the Gunilla Bell at Uppsala Castle and follows the Fyris River south to Övre Föret, ending at the viewpoint on Ultunaåsen. The walk is interdisciplinary and combines practical tasks, short guided tours and study visits. It highlights the area from historical, social science and natural science perspectives – all in line with the upper secondary school curriculum.

How does the walk fit into upper secondary school teaching?

We hope that you as a teacher will see the opportunity to integrate this outdoor educational walk into your teaching. To give students the best possible conditions, the walk should be preceded by preparation in the classroom and followed up with in-depth follow-up work. This gives students the opportunity to develop their abilities and demonstrate their knowledge in different ways.

This booklet contains suggestions for further reading and how the various stops relate to the curriculum. How you choose to prepare your students will of course depend on the subjects you teach and the perspectives you want to highlight. Since sustainable development is a common thread throughout the walk, we recommend that you introduce the concept in advance, for example by showing the film *What is sustainable development?* The Upplandsstiftelsen website has a short introductory film about the Fyris River Walk and a film about sustainable development, which should be shown in the classroom before the walk, for example during mentor time.

Practical information for students

To ensure that students get the most out of the walk, we recommend that, in addition to showing the two films on the Upplandsstiftelsen website, you also inform students of the following in advance:

- The purpose of the walk
- The perspective you have chosen to focus on
- The schedule, lunch, bus tickets and emergency numbers
- Bring snacks and water
- Which teachers will be accompanying the students
- The practical stations along the way
- Group division (approx. 3–5 students) for collaboration
- Follow-up work in the classroom
- Presentation and assessment

In addition to this teacher's guide, there is also a student guide. We recommend that it be printed out for each student or group – remind them to bring a pen.

Presentation of organisers

Upplandsstiftelsen works with outdoor life, public health, nature conservation and outdoor education throughout Uppsala County. Through outdoor education, they promote learning for sustainable development in preschools, primary schools, adapted primary schools and upper secondary schools. Upplandsstiftelsen is the coordinator of the Fyrisåvandringen walk.

The Uppland Museum is the county museum for Uppsala County and focuses on the culture and cultural heritage of Uppland. The museum works across generations and cultures with the aim of contributing to a better world for both individuals and society. During the Fyrisåvandringen, the museum is responsible for a guided tour of Uppsala's history, with a special focus on the area around Uppsala Castle.

Uppsala Vatten och Avfall AB is a wholly owned municipal company with a grand vision: *clean water and smart recycling for sustainable living in a growing Uppsala.* Their mission includes working 'upstream' – i.e. preventively – to educate municipal residents on how we can use the systems in a sustainable way together. Uppsala Vatten's educators mainly visit schools through study visits to their facilities, including Pumphuset. During the Fyrisåvandringen, Uppsala Vatten is responsible for a practical station in Pumphuset at Islandsfallet.

The Swedish University of Agricultural Sciences (SLU) has its main campus in Ultuna, in southern Uppsala. SLU is a world-class university with research, education and environmental analysis in sciences for sustainable living. It is home to the university management and two of the four faculties, the Faculty of Natural Resources and Agricultural Sciences and the Faculty of Veterinary Medicine and Animal Science. During the Fyris River Walk, SLU is responsible for a station focusing on environmental monitoring.

Biotopia (formerly the Biological Museum) opened in 1910 and was groundbreaking in its approach to displaying animals in dioramas – in their natural environments instead of lined up on shelves. These dioramas are still there, but today's activities focus more on interactive activities where visitors can explore animals and nature. Biotopia offers educational programmes tailored to the upper secondary school curriculum and is responsible for a station on biodiversity at Övre Föret during the Fyrisåvandringen, in collaboration with Upplandsstiftelsen.

Practical implementation with students

Introductory film and layout of the walk

Feel free to show our introductory film in the classroom before the walk.
The Fyris River Walk starts at the Gunilla Bell at Uppsala Castle, with three possible start times: 9:00, 10:00 and 11:00. We only accept one class per hour to avoid crowding at the staffed stations. The five practical stations (numbers 1, 2, 5, 8 and 9) are staffed by educators who lead the activities. At other points, there are signs with information and reflection questions that can be used in follow-up work in the classroom. The walk takes between five and six hours, depending on the pace between stations.

Group division

After the first two staffed stations (Uppsala Castle and Pumphuset), the walk continues south along the Fyrisån river. We recommend that you keep the class together as a whole, but that the students are divided into smaller groups of 3 to 5 people to facilitate cooperation. Your teacher will divide the group according to need.

Lunch and snacks

Students need to bring lunch from school, which they will carry with them during the day. The walk is long, so lunch and snacks or fruit are needed. It is a great advantage if lunch is a little more substantial. The pupils will be hungry from being active all day. Many pupils are also thirsty towards the end. Therefore, please ask all pupils to **bring a bottle of water** to supplement the drinks they receive from the school. The first two stations on the walk take about an hour each, which means that it may be two hours from the start before there is an opportunity to eat. For classes starting at 11:00, we therefore recommend that students eat before the walk and bring snacks to eat along the way. Since many students skip breakfast, it may be wise to offer fruit in the morning.

Recommended lunch times:

- Start at 9:00 a.m. – eat lunch at around 10:50 a.m. in Stadsträdgården
- Start at 10:00 a.m. – eat lunch at around 11:50 a.m. in Stadsträdgården
- Start at 11:00 a.m. – eat lunch before the start, take a snack break at around 12:50 p.m. in Stadsträdgården

A general schedule for the entire walk for each start time can be found at the end of the document.

Water

Many students get thirsty during walks, especially if it is hot. Please ask everyone to bring a full water bottle. Fresh water is available at Bouleråker if bottles need to be refilled.

Toilets

Toilets are located in the Pump House, by the Yellow Villa in the City Garden, and by Bouleråker.

Student guidance

Each student or student group should bring a printed student guide with them so that they can take notes during the walk. Students also need a mobile phone to take photos and make calls if necessary.

As a teacher, you choose the perspective the students will have during the day through relevant preparation in the classroom. Both the teacher and student guides contain questions based on a natural science and social science perspective. Feel free to adapt the questions based on the subject and student group.

We, the organisers, can adapt the walk to your wishes *to a certain extent*, but the main features of the five practical stations are central to creating a holistic and in-depth understanding of sustainable development.

Transport
Transportation back to Uppsala city centre from Ulleråker is via city bus 4 from the "Kronparksgården (Uppsala) Läge A" stop. Buses run regularly, but Uppsala Buss has been informed of the increased demand ( ). **The school is responsible for arranging tickets for students who do not have a bus pass**.

Practical stations
At **Uppsala Castle** (Gunillaklockan), you will be met by the Uppland Museum. The Uppland Museum offers a historical guided tour around the castle and provides a historical perspective on why Uppsala grew up in this particular location and the significance of the esker and the Fyris River. You will then continue to **the Pump House**, located by Islandsfallet, which used to pump purified water from the esker out into the city. Today, Uppsala Vatten has an exhibition in the Pumphuset about the ridge and its water purification capabilities. The students will get to conduct a water purification experiment. The walk then continues along the Fyris River. The map that the students have in their student guide contains interesting landmarks and facts about places they pass along the way. The next stop is at **Bouleråker,** where SLU talks about environmental monitoring. The students take water samples from the Fyris River and participate in citizen science. The walk continues to the next stop at **Övre Föret.** There, urban development and life above and below the surface of the wetland will be the focus of some practical activities with Biotopia and Upplandsstiftelsen. The walk ends with some clear examples of biodiversity in the forest on the way up to **Ultunaåsen.** There, the students will summarise their reflections on sustainable development and the global goals together with Upplandsstiftelsen. We will also bake bread over the fire.

Points on the map
The unmanned stations (3, 4, 6 and 7) are marked with signs in the terrain. These contain facts about the location and questions for reflection. Encourage the students to take photos along the way – these can be used in presentations or follow-up work in the classroom, based on the perspective you have chosen.

Contact
The Fyris River Walk is a collaboration between several organisations and educators. If you have any questions, please contact the outdoor educators at Upplandsstiftelsen, who are coordinating the event:

Johan Lindell	johan.lindell@upplandsstiftelsen.se	phone 076-7687755
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Organisers of the Fyris River Walk

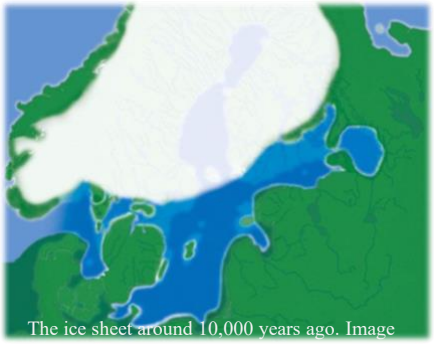
Anna Suarez Larsson	KUPP, Rosendalsgymnasiet
Maria Brandt	Biotopia
Carina Kranse	Uppsala Water
Stina Flink	Uppland Museum
Stina Bengtsson	Uppsala Water
Stina Lindblad	Upplandsstiftelsen
Johan Lindell	Upplandsstiftelsen
Karl Lundén	SLU Environmental Monitoring

Part 2 – The walk

Introduction

Around 20,000 years ago, Scandinavia was covered by a layer of ice several kilometres thick. When the climate became warmer, the inland ice began to melt and the landscape changed dramatically. Rivers formed under the ice, carrying large quantities of stone and gravel with them. As the edge of the ice receded northwards, esker ridges were formed, including the ridge that runs through Uppsala in a south-north direction. At the same time, lighter clay particles spread in the deep waters that covered the area, creating thick layers of clay.

When the ice sheet disappeared and the water level dropped, the ground – which had previously been pressed down by the enormous weight of the ice – began to rise. This land uplift enabled plants, animals and entire ecosystems to establish themselves .[2] The warmer climate also attracted people northwards from more southerly latitudes. Finds show that humans came to our region around 10,000 years ago.[3]



The ice sheet around 10,000 years ago. Image

At that time, the landscape looked very different. Large parts of Uppland were still under water, which means that the region is geologically very young. The oldest traces of human activity have been found in areas that were once above sea level. Water played a crucial role – both as a means of transport and as a source of food, especially fish. Even today, the majority of the world's population lives near coasts, rivers and other waterways.

The landscape looked different back then, and large areas of Uppland were still under water. Large areas of Uppland are therefore geographically very young. The oldest traces of human activity have, logically enough, been found in the areas that were once above the slowly sinking sea level. However, the water was extremely important as a transport route and an important source of food in the form of fish. Even today, most people on Earth live along coasts, rivers and other waterways.

Uppland is often seen as very flat, but the fact is that even the landscape in and around Uppsala has significant differences in elevation. This is evident not least in the boulder ridge. But why did people settle in this particular area, which would later be named Uppsala? The boulder ridge was a natural, dry route with good visibility over the area, which may have been important for people to feel safe when travelling through the landscape. The Fyris River, which runs parallel to the ridge, was also an important route. Over time, the number of people in the Uppsala area grew, and the community that became the foundation of modern Uppsala began to take shape several thousand years ago. Since the sea, and by extension a navigable river valley, stretched significantly further north at that time, it is not surprising that "earlier versions" of Uppsala arose near the Fyris River in areas such as Gamla Uppsala and Valsgärde.[4] Gamla Uppsala is also of religious historical significance as the centre of ancient Norse paganism, which later gave way to Christianity.

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[2] Uppland is still rising by about 6 mm per year, which amounts to 6 m in 1,000 years. Please take a look at two short, excellent film clips about how the landscape rose from the sea after the Ice Age, one about Uppland (https://urian.se/maps/gif/Animation%20Uppland.gif) and one about the area around Uppsala (https://www.youtube.com/watch?v=2Yvv2Ics8Ic).

[3] See https://www.svt.se/special/mot-de-forsta-svenskarna/ and https://www.svtplay.se/de-forsta-svenskarna for excellent background material that can be linked to the teaching.

[4] VisitUppland and Gamla Uppsala Museum have short, informative films on YouTube (https://www.youtube.com/user/VisitUppland/videos; https://www.youtube.com/c/GamlaUppsalamuseumYT).

The time and society we live in are influenced by historical events and decisions. In the same way, our lives today affect not only our own time but also the Uppsala of future generations. What are the conditions that have created – and continue to create – society and the city? What effects will today's decisions have on the existence of future generations? In what ways is the city's development linked to the region as a whole, and ultimately to our entire planet?

In the Fyris River Walk, you can follow the Fyris River from ancient times to the future and see how you are part of the present, but also of history and, not least, the future. You are involved in how we together create our shared existence in a world with limited resources and complex challenges.

The walk

The following text describes the various stations along the Fyris River walk. The locations of the stations are marked on the map.

1. Uppsala Castle (Practical station)

UPPLANDSMUSEET

2. Pump House (Practical station)

UPPSALA VATTEN

3. Tullgarn Bridge

4. Kungsängsverket

5. Bouleråker (Practical station)

SLU

6. Hospital Park

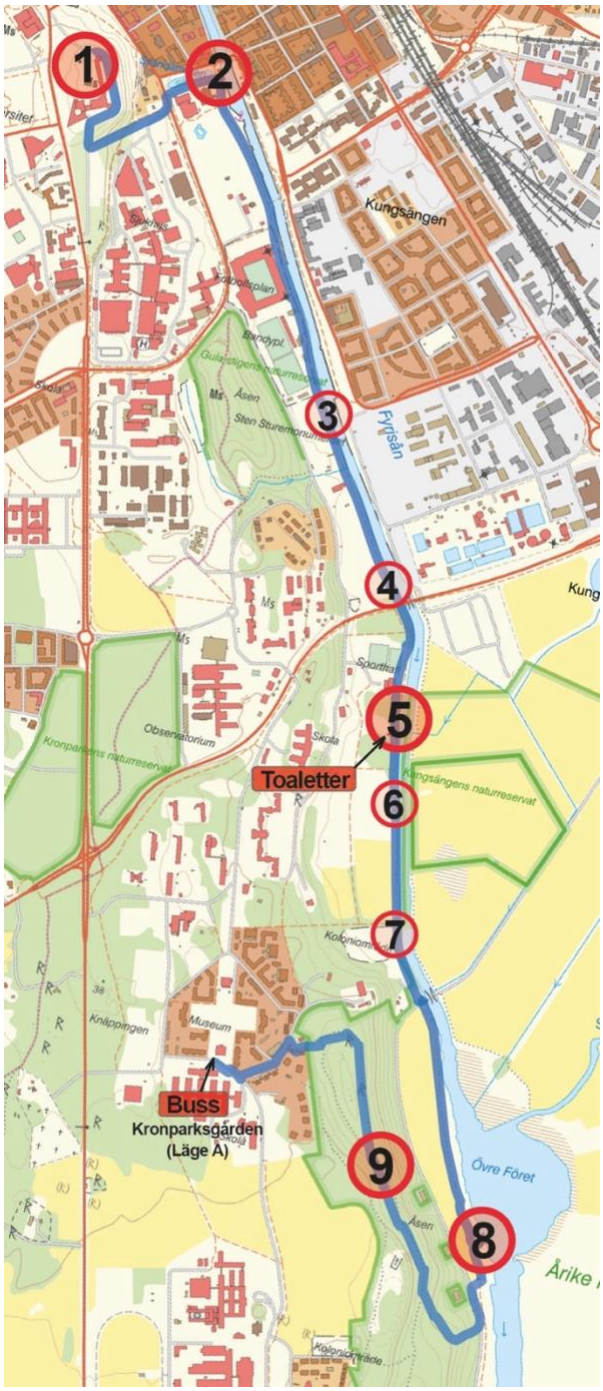
7. Ulleråkers allotment area

8. Övre Föret (Practical station)

UPPLANDS STIFTELSEN
NATURVÅRD & FRILUFTSLIV

9. Ultunaåsen (Practical station)

UPPLANDS STIFTELSEN
NATURVÅRD & FRILUFTSLIV



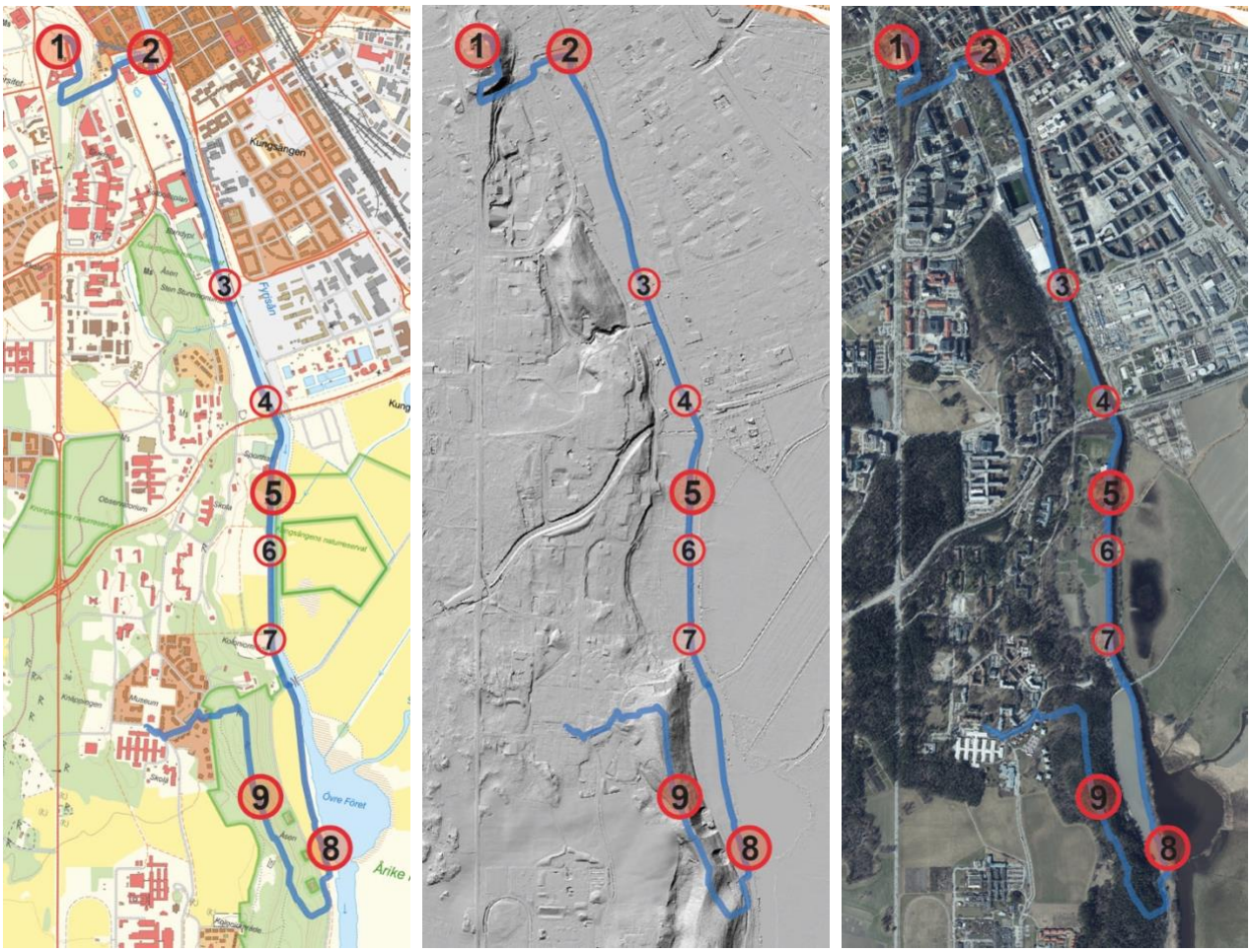


Figure 1. The Fyris River Walk gives you the opportunity to experience the city, the landscape and how society affects nature. The three maps (from lantmateriet.se) above show exactly the same area but with different backgrounds. Feel free to compare them during the walk.

The **general map** on the left provides a traditional overview of an area. It is a good starting point for discussing Uppsala's geography and the course of the Fyrisån river. You can also clearly see different forms of infrastructure in the community (e.g. buildings, roads, railways, bridges).

The grey **terrain map** in the middle shows the topography (elevation structure) of the area with the boulder ridges, the Fyris River and flat areas (wetlands/agricultural land). This is the structure of the landscape left behind by the inland ice sheet. Why do we build our society the way we do? A quick comparison with the general map provides many answers.

Finally, **aerial maps** such as the one on the right (present day) provide an understanding of how we humans use the area in the form of agricultural land and buildings.

1. Uppsala Castle (Practical station with the Uppland Museum)

Participants gather at the Gunilla Bell. The Uppland Museum will guide us from Uppsala Castle down to the City Gate.

Information in the student booklet

Uppsala – why a city here?

The Fyris River has been central to the formation of the city of Uppsala. For a long time, the river was navigable far north of present-day Uppsala, to Gamla Uppsala and further upstream. Due to land elevation during the Iron Age, a threshold emerged where the mill (Uppland Museum) is located today (around 500 AD). This was the shallowest part of the river, making it possible to wade across. In the Middle Ages, the Fyris River was called the Sala River, but the part south of the city, at the level of the Islandsfallet waterfall, was called the Pål River.

The early roads often ran along the ridges, where the ground was dry and more open. However, the waterways were the most important transport routes, and Uppsala was therefore very well located for trade. The first dwellings were found on the east side of the river (on the same side as Stora Torget), but during the 12th century, a castle was built on Domberget (near where the cathedral stands today), and after this, the west side also developed.

In the mid-17th century, it was decided that Uppsala should become a modern city. This meant that streets and houses were demolished to fit into the new grid. The city became a rectangle measuring 800x1200 metres, with straight streets crossing each other at right angles. In 1702, a major fire broke out and almost the entire city burned down in a single night. All that remained of the white castle and the cathedral with its tall spires were smoking ruins.

The university and the church have both been important for the city's growth, but during the 19th century, Uppsala also developed into an industrial city. Between 1850 and 1900, the city's population tripled, from around 7,000 inhabitants to 23,000 at the beginning of the 20th century. In the 1970s, Uppsala became Sweden's fourth largest city in terms of population, which had increased to 100,000. Today, the population is around 170,000 according to Statistics Sweden, and the city is still growing.

Uppsala Castle. Construction of the "Wasaborgen" in Uppsala began in the 1540s, and it looked completely different then than it does today. The castle was built by Gustav Vasa and was intended to serve as a defensive structure with a royal residence in and around the tower. Today, only the bastions remain of the original castle. One of these is the site where the Gunilla Bell stands today.

The Battle of Good Friday. Five hundred years ago, on Good Friday in 1520, one of Sweden's bloodiest battles took place here in Uppsala. The battle was the last major battle in a long conflict over the royal power in Sweden. On the castle hill, there are several mass graves with skeletons of the fallen soldiers.

The castle toll. Located below the castle. Between 1622 and 1810, Sweden had a toll system that imposed an import tax on goods entering Swedish cities. The duty was levied on all "edible, consumable and perishable goods", i.e. food, handicrafts and merchant goods to be sold in the cities. The intention was to raise money for the crown.

Slottskällan. Slottskällan is Uppsala's old water cure facility with a spring that has been known since the 16th century. The building at was built in the spring of 1859 as a cold water cure facility by Lars Georg Dovertie. Today, the building houses offices.

Svandammen. Svandammen, below the castle, was built as a rudd pond, i.e. a pond for domesticated rudd fish, as early as 1590. The pond has had several names, such as Kungsdammen and Slottsdammen, but has long been known as Svandammen in popular parlance. Swans used to live in the pond, but they are no longer there.

Student assignment during the walk
Use your mobile phone to take photos of all the places where the Uppland Museum stops and gives information.

Possible questions to work on in the classroom
Social science perspective
If you stand up at the castle and look out over the city, you can still see the street network, which has hardly changed since the 17th century. Together, you can look for famous landmarks, both historical and contemporary. Can you see the Fyris River, the Uppland Museum, Stora Torget or the train station?

- Why has the Fyris River been important for the formation of the city of Uppsala?
- Both the castle and the cathedral were built on top of the ridge. Why do you think these buildings were placed on high ground? How does the ridge affect today's urban planning?
- How has the population of Uppsala developed and how do you think it will grow in the future?
- What do you think the city will look like in 100 years?

Natural science perspective
Next to the Uppsala Ridge, around Svandammen and in central parts of Uppsala, the ground appears completely flat. In reality, there is an almost 120-metre-deep valley in the bedrock that has been filled with glacial river material. The clay under Svandammen and Fyrisån is almost 80 metres thick!

- Where does the glacial material and clay come from, and why are there such large differences in elevation between the ridge and the surrounding land?
- How does the proximity to the Fyris River affect the vulnerability of the community – positively and negatively? Feel free to link this to perspectives such as economic growth, technological development, environmental problems, inequalities and the resilience of society.

Links to subject plans and the global goals
HI, GE, SH
Global Goals 3, 4, 6, 11, 12

Other
The Battle of Good Friday
https://www.upplandsmuseet.se/digitalaupplevelser/blog-start/2020/langfredagsslaget-500-ar/

Take your own city walk in Uppsala. You can find the material here:
https://www.upplandsmuseet.se/skola/ak-7-922/stadsvandring/

Would you like to know more about the Uppland Museum's school programme?
https://www.upplandsmuseet.se/skola

Uppsala's history in the news
https://www.svt.se/nyheter/lokalt/uppsala/medeltidsfynd-i-centrala-uppsala

2. Pumphuset (Practical station with Uppsala water)

Information in the student booklet
The pump house used to supply the city's population with water purified through the Uppsala Ridge. Here you can learn more about the water's journey through the ridge, about water purification and also about what pollutes our water. We discuss and demonstrate a historical perspective on water supply, describe various drinking water technologies, take a look at our own role in this in the future and the problems we face today and may face in the future. We will also carry out a practical water purification experiment.

Student assignment during the walk
Write down a suggestion for how the school could reduce its water consumption or its use of environmentally hazardous chemicals.

Comments for teachers
The pump house is a historic site with an exhibition about the past and present in relation to water and waste. Here and at many of our other facilities, you can book study visits to learn more about sustainability in practice today and educate students about how their choices affect the environment. You can book free of charge at Utbudsbokningen.

Possible questions to work on in the classroom
Social science perspective
- How did the population of Uppsala obtain drinking water in the past and how do we obtain our drinking water today? How has water treatment changed? Is the system sustainable in a city with a growing population?
- How does a water treatment plant work? What technologies are used to purify water?
- What would be required if the water could not be purified by the Uppsala Ridge? What consequences would this have for the city's economy and expansion?
- How can I help maintain clean drinking water here in Uppsala? What are PFAS?

Natural science perspective
- What ecosystem services do Uppsalaåsen and Fyrisån provide?
- How does the lifestyle of Uppsala's residents affect the maintenance of ecosystem services? Start with everyday situations such as travel and eating habits or clothing choices.
- What does the water cycle look like?

- How is global warming expected to affect precipitation patterns, for example in terms of the amount or occurrence of heavy downpours?

Links to subject plans and global goals
HI, TK, SH, NK, KE, BI
Global Goals 3, 4, 6, 9, 11, 12, 15

Other material
Find more detailed information to work with here: Fyrisåvandringen | uppsalavatten.se

Learn more on our school website: skola.uppsalavatten.se

Book an in-depth study visit free of charge via Utbudsbokningen

Visit facilities virtually with Google 360, including films/quizzes: Virtual facilities

PFAS as a general problem and current news in Uppsala. This could be a good area for interdisciplinary in-depth work and LHU.

- Good film clip about products containing PFAS
- Billions in costs to purify drinking water from PFAS
- How water is purified from PFAS in Uppsala's largest water treatment plant
- Swedes drink contaminated water and how PFAS affects the body
- https://www.extrakt.se/ungas-ackumulering-av-pfas-tio-ganger-hogre-an-vuxnas/

3. Tullgarn Bridge
Information in the student handbook
The Tullgarn bridge is an important link for the continued development of southern Uppsala and the expansion of the city's infrastructure. The Tullgarn bridge connects residential areas in Kungsängen with the Studenternas sports ground, Stadsträdgården and the large workplace Akademiska sjukhuset. It is also an important route for emergency vehicles such as ambulances.

Student assignment during the walk
Write down one positive and one negative effect for the city of Uppsala (or for you personally) of the construction of the Tullgarn Bridge.

Comments for teachers
A new bridge affects society in many different ways. Negative effects on the ecosystem around the bridge could include increased traffic deteriorating the water environment and the ecosystem of the River Fyris. The Fyris River is home to the asp, the provincial fish of Uppland. The construction of the bridge also requires space, which means that older trees have been cut down. Older trees in particular are effective carbon sinks, provide habitats for many other organisms and provide shade. In addition, they have aesthetic value. How do these negative effects weigh against the positive ones, such as the city gaining better communication between the two sides of the river and the construction creating more jobs for a period of time? A long-term effect could be increased mobility across the bridge, which could lead to shorter journeys, new relationships or habits such as increased cycling.

Possible questions to explore further in the classroom

Social science perspective

- Why are the city's bridges located where they are? Why are bridges needed?
- How is a new residential area or shopping centre planned in the city? What needs and conditions are important to consider?
- Who has been involved in deciding on the design of the bridge and what factors may have influenced this: social and economic status, gender, level of education? Are the people who decided on the design of the bridge the ones who will use it? Is the bridge accessible to everyone? How can the residents of Uppsala influence the planning and construction process?
- What does the new bridge mean for residents in the area from the perspectives of social, ecological and economic sustainable development?

Natural science perspective

- How will new constructions such as a bridge affect the ecosystems in the watercourse and on land around the bridge? Will the City of Uppsala compensate for the impact on ecosystems in this case? If so, in what way and is the compensation sufficient?
- What technical and physical requirements must be met in order to build a bridge? Uppsala's soil consists largely of clay. How does this affect the construction work?

Links to subject plans and global goals

TK, SH, NK, BI, FY, GE, HI

Global Goals 3, 4, 6, 9, 11

Other material

https://bygg.uppsala.se/planerade-omraden/tullgarnsbron/

New bridge in Uppsala – introducing the Tullgarn Bridge

Figure 2. The Fyris River drainage basin covers large parts of Uppland. The Fyris River is therefore much more than just the river itself. The Fyris River drainage basin is marked in blue on the map. Enormous amounts of rain (and snow) that fall in this area eventually flow into the Fyris River. The water then flows into Lake Mälaren (which in turn has a larger catchment area) and eventually into the Baltic Sea. Everything in the water, such as nutrients and environmental toxins, is carried along with it. You and everyone else in the city of Uppsala are 'borrowing' water from this part of the water cycle. (Map from lantmateriet.se)

4. Kungsängsverket (Uppsala water)

Information in the student booklet

You are now walking south on the right (west) side of the Fyris River. Before you pass under Kungsängsleden, you will see Uppsala's largest sewage treatment plant, Kungsängsverket, as grey buildings on the other side of the water. At Kungsängsverket, all sewage from Uppsala is treated before being discharged into the Fyris River. The water is mainly purified of organic material and various nutrients from faeces and toilet paper. However, it is difficult to purify the water of substances such as medicines (leftover medicines should be returned to the pharmacy) and many environmental toxins such as PFAS. Uppsala Water is therefore working on new technology to purify pharmaceutical residues from sewage water.

The treatment plant is currently being expanded as the city grows. You are standing at the point where the water cycle in the city comes full circle, where what we have borrowed is returned. This is where the purified wastewater flows out.

Student assignment during the tour

Can you see where the purified water from the treatment plant comes out? Look carefully!

Comment to teachers

On the right-hand side, the students now have the Kap area. This place was previously called Kap Finisterre, which in Latin means "the end of the land". In Uppsala, the name refers to the fact that this is where the Flusterpromenaden walking path, which was built in the 1840s, ended. This meant that the city ended to the south!

Kungsängsverket has been located here since 1945. Before that, there was no proper sewage treatment in the city. For far too long, people relied on the incorrect dilution effect when the water was returned to nature completely untreated. What difference would this small amount of dirty water make to all the masses we have out there in lakes and seas? How wrong they were to be!

Possible questions to explore further in the classroom

Social science perspective

- Why do we need a sewage treatment plant? How does it work? Where does the water go after the Fyrisån river? Think locally and globally.
- The residual products from the treatment plant are used, but for what?
- How do you think the population of Uppsala can be most effectively informed about what they can throw down the drain? How can we increase understanding of what is okay and not okay to put down the drain?
- When the treatment plant was built in 1945, the city centre was much smaller. Is the location of the treatment plant still appropriate as the city expands? Would it be ecologically, economically and socially sustainable to move the facility?

Natural science perspective

- Are there substances that the treatment plant cannot handle? How do Uppsala's emissions affect the health of the Baltic Sea as a sea and ecosystem?
- How important can wastewater analysis be in combating a pandemic or more local spread of infection, for example?

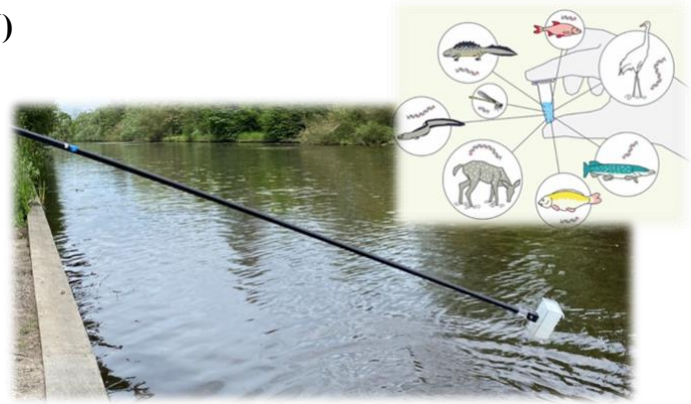
Links to subject plans and global goals

HI, SH, GE, BI, NK, TK.
Global Goals 3, 4, 6, 11

Other
Take a virtual tour of the treatment plant: Virtual facilities. In-depth film: The water cycle – the treatment plant. In-depth brochure about how the plant works: Facility presentation Kungsängsverket 2021.pdf



5. Bouleråker (Practical station with SLU)
Information in the student booklet



At this station, you will learn how researchers at the Swedish University of Agricultural Sciences (SLU) monitor the quality of the water in the Fyris River. For example, they can examine the levels of nutrients and environmental toxins. They can also find out which plants and animals live in the Fyris River by examining DNA residues in the water. Which fish species are declining this year? Is the COVID-19 virus currently spreading in Uppsala? What pesticides are leaking from plots and fields around the river? Sweden is required to take samples of water from rivers and watercourses every year as part of its national environmental monitoring programme. The class will help the researchers collect water samples using a special invention from Uppsala called the 'Fyrishämtaren'.

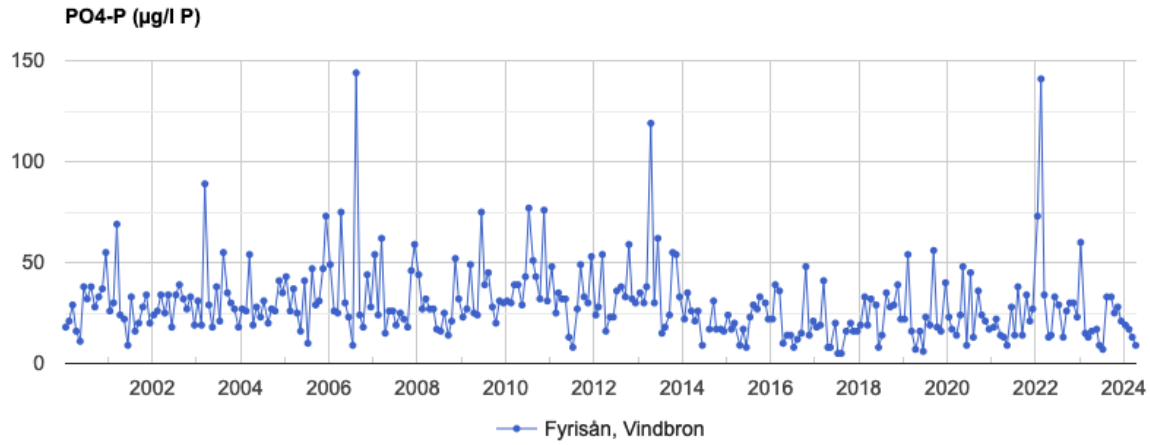


Figure 3. Phosphate levels in the Fyris River at Vindbron. Phosphate is an important nutrient that, in high levels, can contribute to eutrophication. This diagram was created using the web service at https://miljodata.slu.se/MVM/Search. It is easy to create diagrams for other measurements.

Student assignment during the walk
If you take environmental samples at the same place for several years in a row, you get a time series of samples. What are the advantages and disadvantages of taking samples from the same place compared to taking only a few samples?
Comments for teachers
SLU Ultuna is responsible for environmental monitoring of the Fyris River. Sweden has a well-developed system for documenting the state of the environment and changes therein, and environmental monitoring is a cornerstone of this system. Systematic measurements of plant protection products in surface water began in 1990. Today, the presence of so-called eDNA (environmental DNA) is also analysed, which can provide answers as to which organisms are increasing or decreasing in abundance. The students will participate in the various stages of water sampling to understand how researchers work. They will also try out the method that is always used when collecting water samples. To avoid contaminating the samples, they will need to wear face masks and gloves. Many years of analysis data are already available and can be used in teaching after the Fyris River walk.

Possible questions to work on further in the classroom
Social science perspective

- What opportunities do we have in Sweden to influence environmental legislation decided within the EU? What are the advantages and disadvantages of having common environmental legislation within Europe?
- Are there economic incentives to prevent problems with invasive species, or is it more advantageous to take action only once problems have arisen?

Natural science perspective

- What does it mean when species increase or decrease over time? If a new species is discovered in the Fyris River, could this lead to problems, and if so, how would other species be affected?
- What are the advantages and disadvantages of having common environmental monitoring within Europe?
- Why is it important to collect samples to create long, repeated data series?

Links to subject plans and the global goals
BI, GE, KE, MA, NK, SH
Global Goals 3, 6, 13, 14, 15

Other material
Environmental data MVM – a web service with soil, water and environmental data.
The Department of Aquatic Sciences and Assessment at SLU provides more information about current research on water.
Sveriges vattenmiljö (Sweden's water environment) has extremely good and up-to-date information on the state of Sweden's various water environments, how environmental monitoring works, and various services for data and visualisation of different environmental themes and measurement variables.

Chemical levels in Swedish young people.
https://www.forskning.se/2024/11/19/kemikaliemix-i-svenska-ungdomars-kroppar-varierar/

About the aspen in the Fyris River. Johan Persson from Upplandsstiftelsen at the Islandsfallet fish ladder. https://www.sverigesradio.se/avsnitt/aspens-hemliga-liv

6. Hospital Park

Information in the student handbook

South of the city is a contiguous forest area that has been protected as a royal hunting park since the 17th century. This has resulted in the very old and large trees that can be seen today. The large trees fulfil an important function for many species (some of which are red-listed), both as a habitat and for foraging.

At the end of the 18th century, parts of the forest area were cleared to make way for a crown distillery on the Fyris River. In the early 19th century, the distillery buildings were converted into a hospital for mentally ill patients. The idea was to physically separate the physically ill (hospital patients) from the mentally ill (asylum patients). The fact that the hospital was located outside the city made it possible to engage in health-promoting activities such as outdoor recreation and gardening, in accordance with the ideals of the time.

The Ulleråker district is currently undergoing development and thousands of new homes will be built. The hospital garden is being converted into a district park and a visitor attraction in the southern river valley, offering unique natural, cultural and recreational values.

Student assignment during the walk

Use your mobile phone to take a photo of something in the area around the Hospital Park that contributes to *socially* sustainable development.

Possible questions to work on in class

Social science perspective

- A new neighbourhood is being built in Ulleråker. What is important to consider when designing a new neighbourhood? What functions are needed in a new neighbourhood, such as schools, healthcare and social services?
- How has the area and the view of health promotion initiatives changed over time?
- How do we think about health and the need for outdoor activities today?
- Mental ill health is increasing among young people. What could be the reasons for this?

Natural science perspective

- How does the Ulleråker area contribute to biodiversity in the city today through its pine forest, avenue of lime trees, "flower field" and other elements? How can biodiversity be further promoted in terms of park and forest management?
- The park has beehives for domestic bees and a project to increase the proportion of flowering plants in the area. What role do pollinating insects play in sustainable food production locally, regionally and globally?
- Pollinating insects have declined alarmingly and the trend continues to be negative. What factors are behind insect mortality? What will be the consequences?
- How can increased use of antidepressants affect water quality in the Fyris River?

Links to subject plans and global goals

BI, HI, NK, SH
Goals 3, 4, 11, 15, 16

Other material

https://bygg.uppsala.se/planerade-omraden/sodra-astraket/sa-utvacklas-sodra-astraket/hospitalstradgarden/

Sustainability assessment Ulleråker (PDF)

Nature value inventory Ulleråker (PDF)

Biodiversity in the Hospital Garden (https://www.uppsala.se/kultur-och-fritid/natur-parker-och-friluftsliv/parker-lekplatser-och-hundrastgardar/parker/hospitalstradgarden/)

Red List 2020 and summary Status and trends for species and their habitats – red-listed species in Sweden 2020 is published by SLU Artdatabanken (www.artdatabanken.se)

On Artportalen, you can see which species have been reported in the Årike Fyris nature reserve (including the bird tower at Övre Föret) today (link to specific search). Hospitalparken is located in this area, but reports usually concern birds at Övre Föret.

The Centre for Biological Diversity at SLU is an excellent source for finding out more about biodiversity, its values and the threats to diversity. Their popular science magazine Biodiverse has a special issue (link) on the modern mass extinction of species in what is known as "the sixth mass extinction".

The Swedish Environmental Protection Agency has good, comprehensive information about wild pollinators and why they are important (https://www.naturvardsverket.se/amnesomraden/pollinering/).

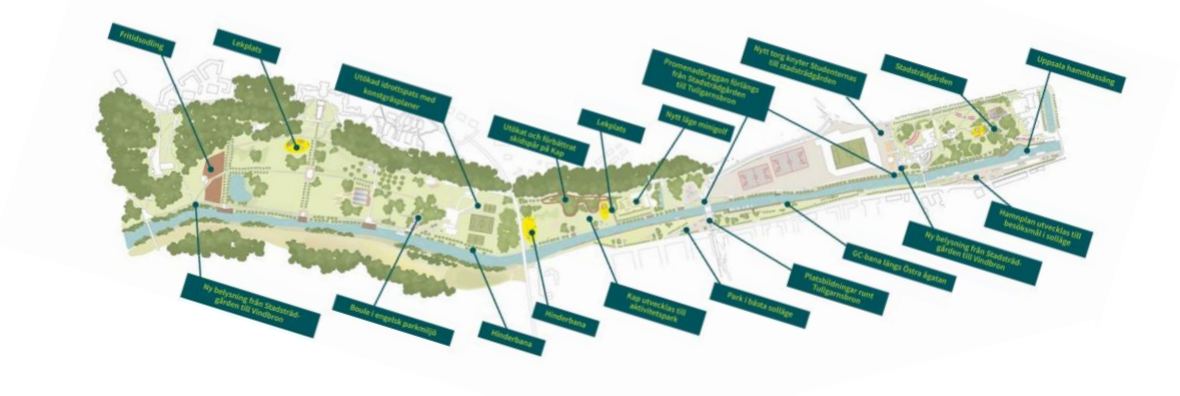


Figure 4. Development of **Södra Åstråket** according to Uppsala Municipality's project plan. Source: https://bygg.uppsala.se/planerade-omraden/sodra-astraket/sa-utvacklas-sodra-astraket/

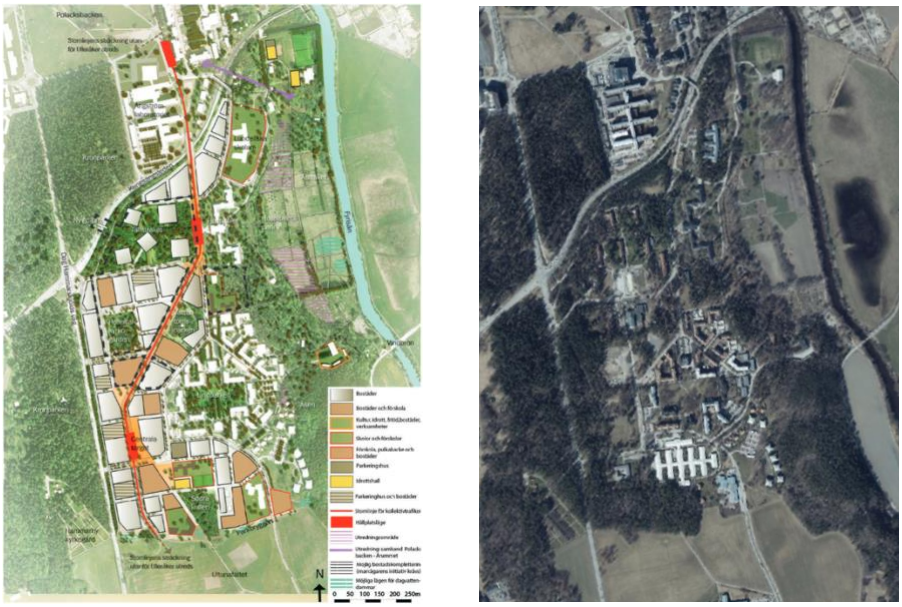


Figure 5. Uppsala Municipality's programme map for Ulleråker, and aerial photo of the area as it looks today. Source https://www.uppsala.se/bygga-och-bo/samhallsbyggnad-och-planering/detaljplaner-program-och-omradesbestammelser/hitta-detaljplaner-och-omradesbestammelser/2021/delomradet-tallstraket-i-ulleraker-del-av-kronasen-125/#samrad.

7. The Ulleråker allotment area

Self-sufficiency was important for the hospital's operations in Ulleråker, and there was arable land, cultivation and greenhouses here. Cultivation has been an integral part of food supply for much of human history. Even city dwellers had farmland and animals in the past. But even in modern times, knowledge of how to grow vegetables has been crucial, for example during the Second World War. Now, the non-profit association Odlarföreningen Ulleråker leases land to create a social environment for cultivation and community.

We live in a social system that is completely dependent on fossil fuels, with continuous economic growth and increasing globalisation. Both the coronavirus pandemic and Russia's invasion of Ukraine in March 2022 suddenly shed new light on our shared vulnerability and how our everyday lives are affected by global events. Global food consumption and production make us dependent on the whole world. The war in Ukraine, for example, affects food prices and food availability in Sweden and throughout Europe. According to real estate statistics and farmers' organisations, interest in urban farming and moving to rural areas is growing in Sweden.

Biological diversity is essential for the Earth's ecosystems to remain in balance and provide us with what we need – air to breathe, water to drink and food to eat. Food production is one of the main causes of biodiversity loss, partly due to the use of pesticides. The food we eat also affects the climate and access to clean water. Food accounts for about a quarter of a person's climate impact, and about 70% of the world's fresh water is used to produce food.

Student assignment during the walk

Imagine that your family had to grow the vegetables you eat. Which vegetables would you like to grow yourself? Are some vegetables better to grow than others (e.g. if they are easier to grow, contain more nutrients or are expensive to buy from a shop)?

Comment to teachers

The global goals and Agenda 2030 describe what we need to achieve in the world by 2030 – eliminate extreme poverty, reduce inequality and injustice, promote peace and justice, and solve the climate crisis. But how? Our actions in the coming years will be crucial to how we manage the transition to a healthy society within planetary boundaries.
https://www.wwf.se/ekonomi-och-finans/inom-planetens-granser/

Possible questions to explore further in the classroom

Social science perspective

- How are conflicts affecting the global food market? Why is the issue of democracy so closely linked to sustainable development?
- How has the Swedish diet changed since the 1960s in terms of imported goods and the proportion of protein from meat? Is it reasonable to expect fresh strawberries in the shops all year round?
- What would happen if all food transport stopped – where would we get our food from? What can we do ourselves?
- How do you think your relationship with food would be affected if you grew it yourself?

Natural science perspective

- What would a locally produced plate of food in Sweden look like in spring, summer, autumn and winter? Which goods are most important to import from a sustainability perspective, for us who eat them and for the people who produce them?

- What ecosystem services do we depend on in order to grow food? How do they affect our food production and what measures are needed to maintain them and make them sustainable?

Links to subject plans and the global goals
BI, HI, NK, SH
Global Goals 3, 4, 11, 12, 15

Lesson suggestions
www.naturskyddsforeningen.se/skola/elevuppgift-mat-kvadrat/

What we eat affects the health of the planet! Test the impact of your last meal on the planet in the WWF Vegoguide (https://www.wwf.se/vegoguiden/) or download the app.

Other
Water shortage for allotments in Ulleråker
https://sverigesradio.se/artikel/6222851

Information about different ways of growing food in Uppsala municipality
https://www.uppsala.se/kultur-och-fritid/aktiviteter-motion-och-idrott/aktiviteter-och-fritidsgardar/odla-i-uppsala/

About ecosystem services
https://www.naturskyddsforeningen.se/faktablad/vad-ar-ekosystemtjanster/

Grow your own vegetables and become self-sufficient
https://www.diva-portal.org/smash/get/diva2:378501/FULLTEXT01.pdf

Figure 6. The Ulleråker allotment area where the non-profit association Odlarföreningen Ulleråker grows flowers, vegetables, fruit and friendship.

Figure 7. View from Uppsalaåsen in Ulleråker, showing the Fyrisån river with Övre Föret, wetlands and adjacent agricultural areas. A large part of the area is a nature reserve: Årike Fyris.

Area context for teachers: Uppsalaåsen, Uppsala Kungsäng and Vindbron

This area is interesting from many perspectives, but in order to limit the scope of the Fyris River walk, we have chosen not to have a station here. The location is therefore not included in the student guide. However, as a teacher, you can choose to highlight selected aspects in your teaching based on the information below.

Uppsala Ridge

Several mighty esker ridges characterise the landscape of the Mälardalen valley. One of these is Uppsalaåsen, which stretches from Södertörn in the south to Billudden in Gävlebukten in the north. The ridge is very important for the region's water supply due to its groundwater deposits. The ridge has a core of coarse glacial river sediment (gravel and stone), surrounded by layers of glacial river sand and clay that were also deposited during the Ice Age when the area was still covered by the sea. Land uplift caused the ridge to rise out of the sea. From the viewpoint, you can see the southern end of the city and the entire wetland area. The forest on the ridge is part of the Årike Fyris nature reserve, where the forest is left to develop freely, which means that it has trees of many different ages and a rich biodiversity.

Uppsala Kungsäng

On the other side of the river lies the Uppsala Kungsäng nature reserve, where the Uppland provincial flower, the martagon lily, grows in spring. The area has been used for haymaking and grazing for a long time and floods in spring and autumn, making the meadow nutrient-rich and productive. The martagon lily has probably spread here from the Botanical Garden in Uppsala. Several rare bird species nest on the marshy meadows, which are an important resting place for migratory wading birds. The land is still mowed and the animals graze, but in modern times it is difficult to manage meadows properly. Several meadow plants worthy of protection have therefore disappeared.

The Vindbron bridge
There has been a crossing between Kungsängen and Ultuna at the site of the Vindbron bridge since the 17th century. The current bridge, which can be opened, was inaugurated in 2018 after a long period without a functioning bridge and is intended for bicycle and pedestrian traffic. Emergency services can also cross the bridge if necessary.

Possible questions to work on in the classroom
Social science perspective
- Wetlands act as water buffers during high flows. Many functions such as the police, schools, hospitals and housing in Uppsala city are located close to the Fyrisån river. What would happen to these social functions if the Fyrisån river flooded? What risks need to be managed and how can flooding be prevented?
- What is the dream image of Uppsala in the future, what is the "desired future"? What skills will tomorrow's decision-makers need in order to develop the city while taking social, economic and ecological sustainability into account?
- Why is the valley so wide and the Fyris River so narrow? What kind of land is there between the river and the ridge? What ecosystem services does the area provide us humans?
- What is Uppsala Ridge used for today? What are materials from the ridge used for?

Natural science perspective
- How can we preserve species that require specific care in order to survive in the long term? What interests should determine which species are worthy of protection? Economic interests? The ecological consequences of species extinction? Social values such as people's need for recreational areas or new housing?
- How can a wetland be converted into agricultural land? Consider what would happen to the wetland if long ditches were dug in the area.
- Does urban expansion affect the wetland and the area? What are the climate benefits of restoring a wetland that has been drained?

Links to subject plans and the global goals
GE, SH, BI, NK, TK, HI.
Global Goals 3, 4, 6, 9, 11, 12, 13, 15

Other material
Uppsala Kungsäng
https://www.lansstyrelsen.se/uppsala/besoksmal/naturreservat/uppsala-kungsang.html

Inauguration of the Vindbron bridge
https://sverigesradio.se/artikel/7035885

The County Administrative Board's risk management plan in the event of flooding
https://www.msb.se/contentassets/59b80b9d371f4369bef67971d0639750/uppsala.pdf

About ice melt
https://www.sgu.se/om-geologi/jord/fran-istid-till-nutid/isen-smalter/

Model of the ridge
https://resource.sgu.se/dokument/publikation/sgurapport/sgurapport202037rapport/s2037-rapport.pdf

8. Övre Föret (Practical station with Biotopia and Upplandsstiftelsen)
Övre Föret is a bulge in the Fyrisån river with large areas of wetland. The area has a wide variety of natural habitats (lakes/watercourses, wetlands, damp beach meadows, pastures) with great biological diversity. To protect this area, the valley through which the Fyrisån river flows, as well as Kronåsen and Sunnerstaåsen, the Årike Fyris nature reserve was established in 2018 (Uppsala Municipality 2018). At this stop, we will focus on the area's natural values. We will take a bird's eye view from the top of the bird tower and investigate life below the surface of the Fyris River.

The students will investigate the ecosystem. We will try to study different organisms to cover different roles in the ecosystem and food chains/food webs: plants (including phytoplankton), different consumers, predators, top consumers. The students will be given their own task to find out some interesting and exciting information about one of the organisms (e.g. phytoplankton, zooplankton, dragonflies/larvae, water scorpions, snails/mussels, asp [fish], pike, osprey, mink).

Student assignments
Bird tower
From the top of the bird tower, you have a great view of Övre Föret and a good overview of the entire area. Look around! Describe the landscape in a few short notes. Has the Fyris River always been here, or could it have moved? What do you think would happen to the area if Uppland were hit by heavy rain?

There is a lot of wildlife in the area. Use binoculars to look for birds. Why do you think this wetland is important for many species?

Below the surface
Use the equipment available to investigate life in the water. With the help of nets, buckets, magnifying glasses and field guides, we investigate biodiversity. What organisms live here? What do they eat? How do they breathe? All species must live together – how do the different species fit into the ecosystem?

Possible questions to work on further in the classroom
Social science perspective
- East of Övre Föret is a bulge in the Fyrisån river that used to be much larger and was called Arosfjärden. The ancient Långhundraleden, which was an important transport route during the Viking Age, ended here in Arosfjärden. Now Långhundraleden has shrunk and is just a small stream – Sävjaån. Where has the route gone?
- West of Övre Föret is the ridge that has now been renamed Kronåsen. Around 6,000 new apartments are planned here in a large contiguous area in Ulleråker. What do urban planners need to consider when planning a large residential area in this particular location?

Natural science perspective
- What consequences did the lowering and draining of lakes and wetlands in the 19th and 20th centuries have? For food production? For greenhouse gas emissions? For the forestry industry? For groundwater? For biodiversity?
- The water that flows through the Fyrisån river in the Årike Fyris nature reserve comes from upstream in the city. The treatment plant has an important task of removing various nutrients and toxins. But how is the ecosystem affected by the substances that society adds? Does it

matter if we drain the wetlands and convert them into agricultural land, or can wetlands somehow mitigate the effects of environmental and climate change?

Links to subject plans and the global goals
GE, SH, BI
Global Goals 3, 4, 6, 11, 13, 15

Lesson suggestions
World Wildlife Fund teacher's guide *Our City in 2030* with facts and exercises
https://wwwwwfse.cdn.triggerfish.cloud/uploads/2021/02/skolmaterial-influence-the-future-feb-2021.pdf

Other
Uppsala Municipality (2018). Formation of the Årike Fyris nature reserve.
https://www.uppsala.se/contentassets/531897355fd54f1bbadb85d9106b023e/arike-fyris-antaget-beslut-kf.pdf

Uppsala Municipality brochure about Årike Fyris with a map of the area.

Uppsala Municipality's page about the nature reserve: https://www.uppsala.se/kultur-och-fritid/natur-parker-och-friluftsliv/friluftsomraden-naturreservat-och-leder/friluftsomraden-och-naturreservat/arike-fyris-naturreservat/

Uppsala County Administrative Board about Årike Fyris.
https://www.lansstyrelsen.se/uppsala/besoksmal/naturreservat/arike-fyris.html

The Swedish Environmental Protection Agency's page on the importance of wetlands.
https://www.naturvardsverket.se/amnesomraden/vatmark/varfor-ar-vatmarker-sa-viktiga/

Toxins in insects in the Fyris River
https://www.svt.se/nyheter/lokalt/uppsala/insekter-i-fyrisan-bar-pa-33-olika-lakemedel

Pharmaceutical residues in the Fyris River
https://www.svt.se/nyheter/lokalt/uppsala/sa-ska-lakemedelsresterna-i-fyrisan-i-uppsala-minskas

The Fyris River catchment area
https://fyrisan.se/fyrisan/
http://www.fyris-on-line.nu/

High risk of flooding in Uppsala
https://svt.se/nyheter/lokalt/uppsala/ny-rapport-uppsala-bland-storst-risk-for-oversvamningar-i-sverige

Flood map – information about 100-year flows in the Fyris River. Can be linked to sustainable development and climate change/adaptation.
https://gisapp.msb.se/Apps/oversvamningsportal/avancerade-kartor/hot-och-riskkartor/uppsala.html

Old pictures from Skolgatan in 1900
https://www.smhi.se/kunskapsbanken/hydrologi/historiska-oversvamningar/1900-oversvamning-i-fyrisan-1.12894

Figure 8. Here at Övre Föret's bird tower is the practical station with Biotopia and Upplandsstiftelsen.

9. Ultunaåsen (final practical station with Upplandsstiftelsen)

Information in the student booklet

At this station, we climb the important Ultunaåsen ridge (which is part of the long Uppsalaåsen esker). A little further south along the ridge is the Swedish University of Agricultural Sciences (SLU). Exciting research is being conducted there that will lead us towards a sustainable future!

First, we will take a closer look at the biological diversity of the forest in the Årike Fyris nature reserve. In the nature reserve, the trees are left untouched, and when they fall to the ground, they are left where they are. They then become home and food for many different insects and fungi, for example. Unfortunately, many species are endangered and are included in the so-called red list.

Once we reach the viewpoint on Ultunaåsen, the Upplandsstiftelsen will treat us to bread baked over an open fire. We will also talk about how the Fyris River hike ties in with the global goals.

Questions during the concluding discussion

- How have the global goals and the different perspectives of sustainability (ecological, social and economic) been visible during the Fyris River Walk?
- What is the most important area for you to get involved in?

Comments to teachers

At this station, we try to summarise the whole day based on the global goals for sustainable development. The different stations highlight ecological, social and economic sustainability in different ways, as well as the 17 global goals. Together, the practical stations create a whole and show that all three aspects of sustainability and all global goals are interlinked. Our aim here is for pupils to gain an insight into the different perspectives and for the issues to be a living part of our city at all times. Everyone can make a difference – locally, regionally and globally.

Possible questions to work on in the classroom

Social science and natural science perspectives

- Almost all countries in the world have agreed on the global goals. Is it possible for all countries to contribute equally to sustainable development? Whose responsibility is it to ensure that countries fulfil their commitments?
- How can you use your knowledge to contribute to a sustainable Uppsala in the future?
- How does the Ulleråker area contribute to biodiversity in the city today through its pine forest, lime tree avenue, allotment gardens and other elements? How can biodiversity be further promoted in terms of park and forest management?

Reporting suggestions

The outdoor educational walk provides many opportunities to give students tasks that can be assessed. After the walk, various forms of reporting can be used to give students the opportunity to describe what they have learned.

- Essay
- Blog
- Presentation/slideshow
- Exhibition
- Poster
- Literature review/in-depth study
- Essay
- Activity for younger students

References

Faskunger, J., Szczepanski, A., Åkerblom, P. (2018) *Classrooms with the sky as a ceiling. A knowledge overview of what outdoor education means for learning in primary school.* Linköping University, Swedish University of Agricultural Sciences and Movium Think Tank. Available at http://liu.diva-portal.org/smash/get/diva2:1218908/FULLTEXT05.pdf

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Links to global goals

The entire excursion is primarily linked to Goal 3 Good Health and Well-being, Goal 4 Quality Education, Goal 6 Clean Water and Sanitation, Goal 11 Sustainable Cities and Communities, Goal 14 Life Below Water, and Goal 15 Life on Land. However, there are links to all of the global goals.

The United Nations Development Programme (UNDP), which supports countries in achieving the global goals, describes Goal 3 as follows: “Good health is a fundamental prerequisite for people to reach their full potential and contribute to the development of society. People’s health is influenced by economic, ecological and social factors, and Goal 3 includes all dimensions and people of all ages.”

The UNDP describes Goal 4 as follows: “Education is a fundamental human right. Yet an estimated 774 million people worldwide are still unable to read or write, two-thirds of whom are women. Research shows that inclusive, quality education for all is one of the most important foundations for prosperity, health and equality in every society.”

al target 4.7 EDUCATION FOR SUSTAINABLE DEVELOPMENT AND GLOBAL CITIZENSHIP: By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including through education for sustainable development.

The UNDP describes Goal 6 as follows: “Water is essential for life on Earth and therefore essential for human health and sustainable development. Water is also essential for global food and energy production, and water scarcity can therefore be a cause of conflict, both within and between countries. However, water is not necessarily a source of conflict; water resources can also serve as a unifying force that strengthens cooperation and creates solutions for peace.”

The UNDP describes Goal 11 as follows: “Over half of the world’s population lives in urban areas, and this proportion is expected to rise to 70 per cent by 2050. Growing cities can create new opportunities for economic growth, but can also contribute to increased social divisions and pressure on ecosystems. Rapid and large-scale urbanisation places new demands that need to be addressed in an ecologically, economically and socially sustainable manner.”

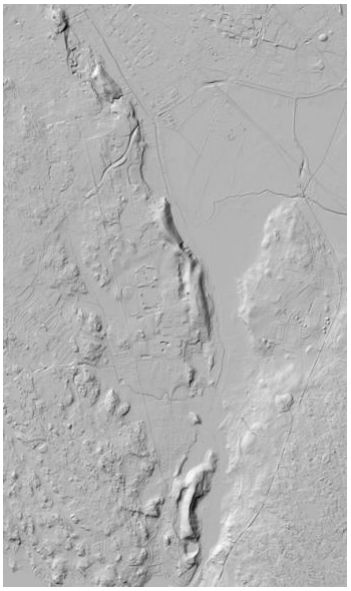
The UNDP describes Goal 14 as follows: “The world’s oceans – their temperature, chemistry, currents and life – drive global systems that make the Earth habitable for humanity. The oceans cover 70 per cent of our planet and over three billion people depend on marine and coastal biodiversity for their livelihoods. How we manage our oceans is crucial for humanity as a whole and for balancing the effects of climate change.”

The UNDP describes Goal 15 as follows: “Sustainable ecosystems and biodiversity are the foundation of life on Earth. Meeting humanity’s needs for food, energy, water, minerals and raw materials without damaging biodiversity and ensuring sustainable use of ecosystem services is a critical challenge for our survival.”

Map material

Various maps can be used to clarify the outdoor experience and continue the work in the classroom. Below are three examples from the Lantmäteriet map service Min Karta. All three show exactly the same area.

The **general map** on the left provides a traditional overview of an area. It is a good starting point for discussing the geography of Uppsala and the course of the River Fyris. You can also clearly see different types of infrastructure in the community (roads, railways, bridges). The grey **terrain map** in the middle shows the topography of the area with its boulder ridges, the Fyrisån river and flat areas (wetlands/agricultural land). Why do we build our communities the way we do? A quick comparison with the general map provides many answers. Finally, **aerial maps** such as the one on the right can provide an understanding of how we humans use the area in terms of agricultural land and buildings.



Overview of the walking tour schedule

Below is the schedule for the walk based on the current start time at the Gunilla Bell. Please note that the times are approximate.

Walk starts at 9:00 a.m. Gunilla Bell at Uppsala Castle

9:00 Introduction and guided tour from the castle to Svandammen with the Uppland Museum

9:50 Study visit to the Pump House

10:50 Lunch in the city garden or Bouleråker

11:30 Environmental monitoring and sampling at Bouleåker with SLU

12.20 Life above and below the surface at Övre Föret with Biotopia and Upplandsstiftelsen

13.20 Summary of the global goals and bread baking with Upplandsstiftelsen

14:00 Conclusion and walk to the buses

Walk starts at 10:00 a.m. Gunilla Bell at Uppsala Castle

10:00 Introduction and guided tour from the castle to Svandammen with Uppland Museum

10:50 Study visit to Pumphuset

11.50 Lunch in the city garden or Bouleråker

12:30 Environmental monitoring and sampling at Bouleåker with SLU

13:20 Life above and below the surface at Övre Föret with Biotopia and Upplandsstiftelsen

14.20 Summary of the global goals and bread baking with the Upplandsstiftelsen

15.00 Conclusion and walk to the buses

Walk starts at 11:00 Gunilla Bell at Uppsala Castle

Lunch before the start of the Fyris River walk

11:00 Introduction and guided tour from the castle to Svandammen with Uppland Museum

11:50 Study visit to the Pump House

12:50 Coffee break in the city garden

13:30 Environmental monitoring and sampling at Bouleåker with SLU

14:20 Life above and below the surface at Övre Föret with Biotopia and Upplandsstiftelsen

15:20 Summary of the global goals and bread baking with Upplandsstiftelsen

16.00 Conclusion and walk to the buses

Figure 9. The global goals grouped according to ecological (environmental), social and economic sustainability. Source: globalamalen.se.

The Fyris River Walk is a collaborative project between Upplandsstiftelsen, KUPP, Biotopia, the Uppland Museum, Uppsala Water and SLU. The Upplandsstiftelsen's investment in outdoor educational activities for upper secondary schools in Uppsala is financed by a government LONA grant to the local nature conservation project *Lära in utomhus på gymnasiet (Learning outdoors in upper secondary school)* in Uppsala Municipality, in close collaboration with Upplandsstiftelsen.