



Project: NOW 22297

Diseases, Diversification and Deliverables

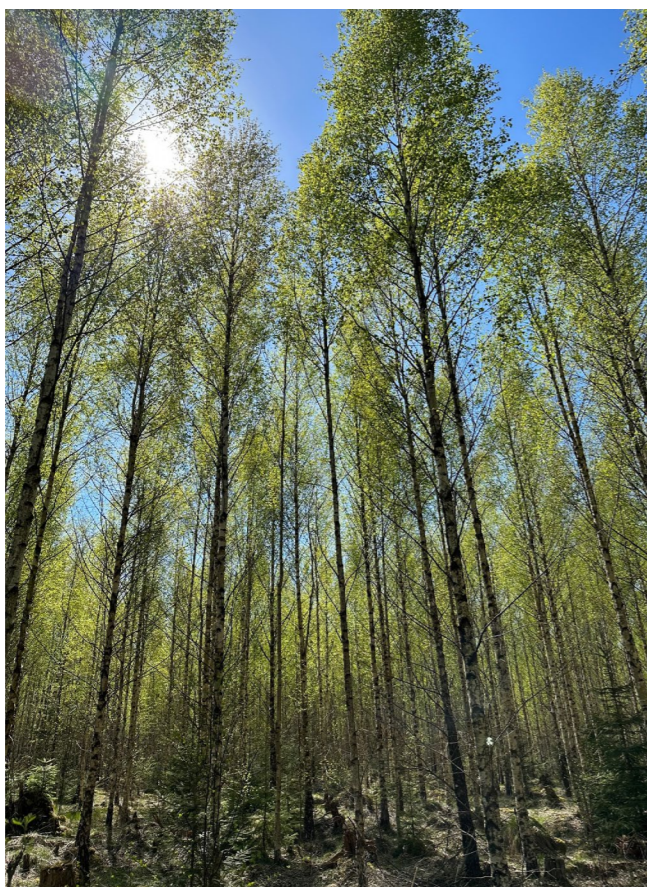
IUFRO 2024 - Post congress tour to southern Sweden
29 June - 4 July, 2024 (6 days / 5 nights)

Dates and schedules are subject to change.

Trip confirmation requires a minimum of 20 participants

This Division 7 (Forest Health) and Division 1 (Silviculture) thematic tour from Stockholm to the south will showcase the many ways in which forests are important to Sweden: as productive forests for the country's forest sector – the world's largest exporter of pulp, paper and sawn wood products combined, as key habitats for maintaining biodiversity and for citizens – for hunting, for picking berries and mushrooms, for recreation and contemplation.

Swedish forests are managed to provide multiple benefits, however these are often constrained by various harmful biotic agents (forest pests and pathogens, ungulates) and by the changing climate with extreme events such as drought, storms and fires. Participants will see and learn why and how we manage the forest as we do, how forestry affects the biodiversity, current and future challenges to this management, how long-term experiments, cutting-edge techniques and climate adaptation in practice are used to manage and prevent damage risks so that future forest production is secured, ensuring healthy forests for the future.



Highlights of the tour

Experiencing Sörmland

You will stay in a relaxing and inviting atmosphere close to the wild, which can be seen in their natural environment, at Öster Malma Hotel and wildlife park. We will visit different types of forests in the area, showing and discussing challenges and opportunities related to Swedish forests and forestry, e.g. insect pests outbreaks and precision thinning operations.

Included:

- **Öster Malma forest estate and wildlife park**
Guided tour at the castle and a visit to the wildlife park. You will learn about the history of the place and culture of Sweden.
[Öster Malma hotel and wildlife park – ostermalma.se](https://ostermalma.se)
- **Forest visits**
We visit the four groups of forests in Sweden: private forests, state-owned forests, community forests and company forests, e.g. the small forest company Boxholms Skogar.
[Boxholms Skogar AB – boxholmsskogar.se](https://boxholmsskogar.se)
- **Barbecue evening**
A moment to enjoy and experience the typical Swedish meal and barbecue.
- **Torpöns Färjeläge**
Experience a tour at S/S Boxholm II boat - one of Sweden's oldest and last wood-fuelled steamboats.
[About S/S Boxholm II – boxholm2.com](https://boxholm2.com)

Öster Malma forest estate

In the heart of Sörmland, only 50 minutes from Stockholm, you will find Öster Malma - a large forest estate and wildlife park managed by the Swedish Hunters' Association. With nature just around the corner, you as conference guests will become inspired in a relaxing and inviting atmosphere close to the wild. The old country seat Öster Malma, now with its castle and two wings, is beautifully located on the shores of Lake Malmasjön, in the lovely county of Sörmland.

Wildlife park

The wildlife Park gives everyone who come here an opportunity to see Swedish wildlife animals in their natural habitat. Here it's important to embrace the fact that this is wildlife, even though the animals are kept in the park are bred in captivity. Here, the moose, who is the king of the forest, have full access to our forests, and the red deer to its marshland. The animals will therefore not be standing on display behind the fence, but instead be seen in their natural environment. With

a guided tour at the castle and the visit to Viltpark, the participants will learn about the history of this place. Hunting is a popular free time activity, deeply rooted in Swedish culture. On the other hand, browsing damage is a major factor limiting development and forest growth. Therefore, the topic of hunting in Sweden is highly debated and still an unresolved issue.

In Sweden, Norway spruce (*Picea abies*) is one of the most commercially important tree species in Sweden, but about 25% of its stands are affected by root rot and butt rot, mainly caused by *Heterobasidion* spp. Another important damaging agent in spruce forests is the spruce bark beetle (*Ips typographus* L.). Sweden is in the midst of an unprecedented bark beetle outbreak which has caused record levels of mortality in spruce forests



Bark beetle damaged Norway spruce.
PHOTO: MICHELLE CLEARY

that, in just the last few years, exceeds what has occurred cumulatively over the previous 70 years. Climate change is expected to have important consequences for the distribution, abundance, physiology, behaviour and ecology of all species. There is evidence that insect pests, including spruce bark beetle, have already responded to such changes via range shifts and changes in phenology. Disruption of those interactions on the plant-insect level can have significant effects on the future forest ecosystems.

Forests in Sweden are usually divided into four groups according to the status of the owners:

private forests, state-owned forests, community forests and company forests. On this day, we visit the different types. The small forest company Boxholms Skogar AB operates and manages approx. 36 000 ha of productive forest land in southwestern Östergötland. The rich traditions of the company's activity date back to 1872. Boxholms Skogar AB passionately has a vision to manage their land in a sustainable way and combine both economic and ecological goals with help of historical experience and modern knowledge.

In Sweden, approximately 400 million hectares of forest land are thinned annually. Thinning operations are fully mechanized and protection against the root rot fungus (*Heterobasidion annosum* s. l.) is obtained by mechanically spraying on freshly cut stumps with spores of the antagonistic fungus *Phlebiopsis gigantea* (commercialized as Rot-stop®).



Stem decay caused by Heterobasidion root rot in Norway spruce.
PHOTO: JONAS RÖNNBERG

Traditionally, thinning operations in Sweden are planned according to the stands average values (basal area, tree height and tree species composition). However, today's forest managers have an access to detailed information (laser scanning, remote sensing etc.) about the forest, down to the level of individual trees. Precision thinning operations based on such detailed information opens up possibilities to account for within-stand variation that may be caused by e.g. abiotic or biotic damage, spatial and temporal variation in site conditions, competition, and prior silviculture. Precision thinning operations that allow for decision making on pixel or even tree level basis

is a hot topic of contemporary forest debate in Sweden.

Enroute we will stop by and enjoy the S/S Boxholm II boat - one of Sweden's oldest and last wood-fuelled steamboats. A lunch at Torpöns

Färjeläge restaurant will follow the tour with nature and culture guiding of Lake Sommen.

Lake Vättern and Vadstena

This part of the tour will showcase Omberg Ecopark, one of the country's most visited nature areas with a mosaic of forests and dramatic mountain slopes, managed by Sveaskog – Sweden's state forest owner. We will visit the city and surroundings of Vadstena and its former monastery from the Middle Ages, Vadstena kloster, where you will spend the night in the magical and peaceful monastery hotel.

Included:

- **Omberg Ecopark**
Enjoy Sweden's most species-rich forest landscape.
[The ecoparks of Sveaskog, e.g. Omberg – sveaskog.se](https://sveaskog.se)
- **Vadstena**
Embrace the nature and the historical city.
[The city of Vadstena – info.vadstena.se](https://info.vadstena.se)
- **Overnight in Vadstena Klosterhotel**
Experience a night in a historical place.
[Vadstena klosterhotel – klosterhotel.se](https://klosterhotel.se)
- **Guided tour in Vadstena abbey**
Learn about the history and art of one of Sweden's best-preserved castles from the era of Gustav Vasa in the 16th century.
[Vadstena abbey – upplevadstena.se](https://upplevadstena.se)

Omberg Ecopark

Located on the shores of Lake Vättern in Östergötland, Omberg Ecopark is one of the country's most visited nature areas with a mosaic of forests and dramatic mountain slopes, managed by Sveaskog – Sweden's state forest owner. The area is known as one of Sweden's most species-rich forest landscapes, with many rare natural environments. Here, you will find beautiful beech forests, centuries-old spruce forests, colourful meadows, cultural monuments and breath-taking views.

The Ecopark is home to some 400 giant oaks - the most biologically rich tree in our country which serves as habitat for over a thousand species. Om-

berg Ecopark aims to increase the number of giant oaks to 5,000 – a goal that will take several generations to achieve. Several recent decline events have occurred in different noble broadleaved tree species and oak is no exception. Climatic extremes and root pathogens (*Phytophthora* spp., *Armillaria* spp.) are thought to play an important role in the decline of oak. Oak restoration activities can be seen in in both young and old forests. A mile-long steep slope with natural forests also leaves a big mark on the landscape. You can enjoy the fantastic view from Hjässan - Omberg's highest point - and walk among giant oaks and centuries-old firs or let yourself be captivated by the beautiful orchids found in Omberg's many limestone marshes.



Omberg Ecopark. PHOTO: EFRAIMSTOCHTER, PIXABAY

At Omberg, Dutch elm disease at ash dieback have wreaked havoc on elm and ash forests, seriously threatening the existence of these species and associated biodiversity.

Vadstena

Words cannot convey the aura of history that pervades throughout Vadstena. It is an exceptional place with a magical atmosphere. Abundant evidence of this takes the form of the many remarkably well-preserved medieval buildings in which one can almost step back in time. Not least among Vadstena's other attractions is its proximity to Lake Vättern, which affords beaches and aquatic activities. A key factor in maintaining an atmosphere of peace and tranquillity and generating energy and movement in Vadstena is the pride and sense of custodianship that the residents have in the place that creates it. A place that, for centuries, people have turned to for recreation and inspiration. Vadstena has always been a place to marvel at, visit, return to, enjoy and stay in.

Overnight in Vadstena klosterhotel Housed in a former monastery from the Middle Ages, this historic hotel is located on Lake Vättern in quaint Vadstena. Guests can relax with in the peaceful settings or at the on-site spa.

From luxurious parties to monastic life: King Magnus Eriksson and his wife Blanche had such incomparable parties in the palace in the 14th century that the courts in Europe spoke with envy of the luxury of the Swedish royal house. Birgitta Birgersdotter (Saint Birgitta) was of the opposite nature. She converted the royal palace into a monastery of the Lord. Spartan monastic life centered around prayer and work. During the Swedish wars against Russia and other major powers in Europe, Gustav II Adolf established a Krigsmanshus in the old monastery buildings. It was a nursing home for wounded and disabled soldiers and their families. Now it is an amazing hotel with many facilities.

Guided tour in Vadstena castle

One of Sweden's best-preserved castles from the era of Gustav Vasa in the 16th century.



Declining oak infected by *Phytophthora* spp., PHOTO: MIMMI BLOMQUIST



Vadstena castle PHOTO: EFRAIMSTOCHTER, PIXABAY

Småland - Sweden for real

The region of Småland is as Swedish as it gets: pristine nature with over 5,000 lakes and rivers, quaint red cottages, a rich culture, the birthplace of IKEA and famed children's book author Astrid Lindgren. The tour will make a stop at Asa Experimental Forest and Research station, one of the SLU's (Swedish University of Agricultural Sciences) field base research units and the surrounding experimental forest, owned by Sveaskog (Sweden's largest forest owner).

Included:

- **Asa Experimental Forest and Research station**

We visit the research station and discuss its research programmes on pine weevil control, continuous cover forestry, various tree species experiments, and carbon dioxide exchange between forest soil and the atmosphere.

[Asa Experimental Forest and Research station – slu.se](https://www.slu.se/en/asa-experimental-forest-and-research-station)

- **Asa Herrgård**

Dinner and overnight at Asa Herrgård, a manor from the 17th century surrounded by beautiful and quiet nature.

[Asa Herrgård – en.asaherrgard.se](https://www.asaherrgard.se/en)

The typical landscape of inland Småland offers dense coniferous forests. Scots pine (*Pinus sylvestris*) is the second most dominant tree species in commercial Swedish forestry, accounting for 39% of the total standing volume in Swedish forests.



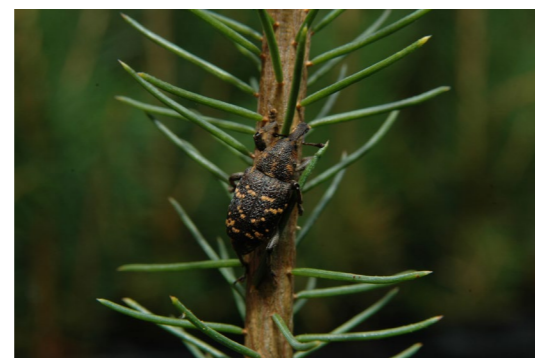
Pine forest Sweden

PHOTO: IRYNA MATSIAKH

Asa Experimental Forest and Research station

is located in the heart of Småland in a picturesque area surrounded by forests, pastures and lakes. Local stands are dominated by Norway spruce and Scots pine.

However, mixtures of both species and native broadleaves are also common. The station is one of the SLU's (Swedish University of Agricultural Sciences) field base research units and the surrounding experimental forest is owned by Sveaskog (Sweden's largest forest owner). The scope of research at the station is broad and includes research programs for pine weevil control, continuous cover forestry, various tree species experiments, and carbon dioxide exchange between forest soil and the atmosphere.



Pine weevil

PHOTO: PER-ERIK LARSSON

High-yield experimental forest is one of the Asa's trademarks. The research conducted at Asa addresses questions regarding intensive forest management on a landscape level such as fertilization and water quality, recreation value and intensive forest management, forest damage, non-native tree species (Douglas-fir, grand fir, hybrid larch) and their influence on flora and fauna. The whole concept is absolutely unique for the boreal forest region.



Needle cast disease in mature pine.

PHOTO: IRYNA MATSIAKH

Regeneration issues are a key research focus in Sweden to increase the use of pine but establishment is challenged by several abiotic factors (e.g. drought) and biotic factors (several fungal diseases, ungulate browsing, pine weevil). Local outbreaks of pine needle cast disease have been associated to drought events. Here, new techniques such as multispectral and hyperspectral drone imaging offer huge potential for monitoring forest health conditions in forest stands. Low-intensity management using shelterwoods, seed trees and, if necessary supplementary planting, will also be demonstrated.



Drone with multispectral sensors acquiring precise imaging of crown conditions in disease-stricken stands.

PHOTO: IRYNA MATSIAKH

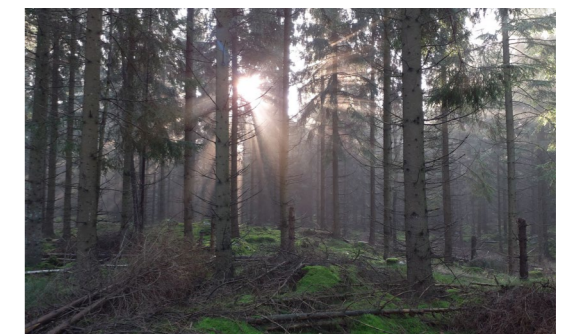
Birch (*Betula* spp.), (primarily, naturally regenerated), was shown to have relatively low production compared to Norway spruce and Scots pine. However, genetically improved Silver birch (*B. pendula*) is an interesting alternative to both species. The proportion of birch in the total standing volume of Swedish forests is continuously increasing (~13%). However, there is still a lack of knowledge on stand establishment, management and stand development for planted birch. Therefore, extensive, multidisciplinary research efforts are taken to overcome these knowledge gaps within a new Centre of Excellence "Trees For Me".



Silver birch (Betula pendula) in Sweden.

PHOTO: ANDIS ZVIRGZDINS

The research station also hosts information activities in the experimental forest, mainly through field trips and teaching in the field. Both scientific field experiments and educational landscaped demonstration areas are utilised for these activities. Every year the research station receives hundreds of researchers, students and other visitors. The long traditions of silviculture research together with beautiful landscape surely makes Asa one of the finest places that we will visit during the tour.



Norway spruce (Picea abies).

PHOTO: ANDIS ZVIRGZDINS

Asa Herrgård

Overnight and dinner at Asa Herrgård – a jewel with fantastic nature, located in a quiet zone at the lake. Asa Herrgård dates back to the 17th century, is located in the heart of the quiet forest, 10 km east of Lammhult by the northern point of the 120 km long lake system, which makes Asa the perfect starting point for canoeing, fishing and hunting adventures.

The manor's history stretches back to the Middle Ages and the farm has been in several noble families of possession. In the old days it was said Asa have the most beautiful forests in the whole Småland and now is a good opportunity to experience the tranquility and Asa beautiful scenery along the paths and trails.



Asa Herrgård
PHOTO: ASA HERRGÅRD

Blekinge - the Garden of Sweden

The small county of Blekinge serves up magnificent coastal nature and culture, including great archipelago adventures. The nature reserve of Eriksberg is characterized by a varied nature and a rich cultural history. This area is part of one of Northern Europe's largest wildlife reserves with deers, European bison, wild boar, and moufflon freely roaming around in this unique nature reserve. Eriksberg also has a rich bird life and one of the world's largest protected red water lily populations. If you're lucky, you'll see the sea eagle!

Included:

- **Eriksberg Hotel & Nature Reserve**
Dinner and overnight at the cosy and charming hotel surrounded by beautiful nature.
[Eriksberg Hotel & Nature Reserve – eriksberg.se](https://eriksberg.se)
- **Guided Safari on the animals' terms**
Explore this unique coastal landscape with lush deciduous forests.



Sea eagle PHOTO: PERCY CHRISTIANSSON

Eriksberg Hotel & Nature Reserve

Located in the Blekinge archipelago, Eriksberg Hotel & Nature Reserve offers a complete facility in the middle of nature, where the wild animals are part of the surroundings. The nature reserve on this coastal landscape is characterized by deciduous forest, pine forest, deciduous swamp forest, rocky forest, juniper bushland, wooded and open pastures, heath and grassland, seashore meadow, rocky ground, sea bay, island, lakes and ponds; and a rich cultural history.

This area is part of one of Northern Europe's largest wildlife reserves. Here, Red deer, fallow deer, Père David's deer, European bison, wild boar, and moufflon freely roam around in this unique nature reserve. Eriksberg also has a rich bird life and one of the world's largest protected red water lily populations. If you're lucky, you'll see the sea eagle! A charming place for those looking for other experiences than a typical hotel. You will overnight, have dinner and have a guided Safari on the animals' terms at Eriksberg Hotel & Nature Reserve..



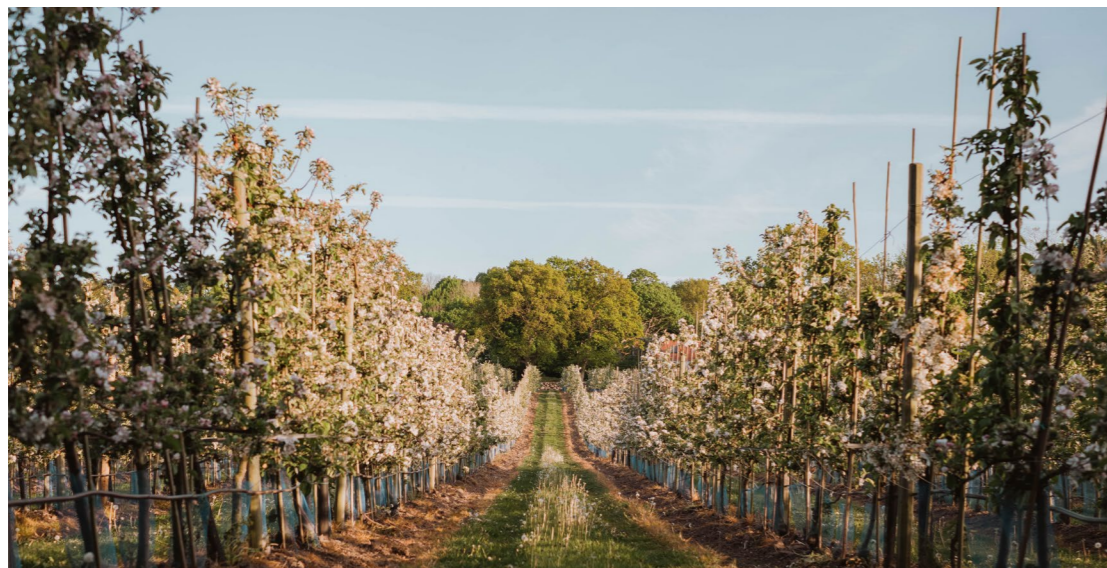
Eriksberg's safari car PHOTO: ANGELICA ZANDER

Österlen - paradise in southern Sweden

Tucked away in the southeast corner of Skåne, in southern Sweden lies Österlen – a region full of century-old cottages, antique shops, art galleries, incredible restaurants and farm hotels, hiking trails, quaint fishing villages, and the most beautiful Swedish beaches.

Included:

- **Kivik – The Apple Kingdom**
A visit to Kivik, a large orchard region famous for its cultivation of apples.
[The area of Kivik \(in Swedish\) – kiviksturism.se](https://www.kiviksturism.se)
- **Stenshuvud National Park**
We will see many different types of nature in a small area, and look into the problems the pathogen *Phytophthora* spp. is causing here and in many other protected areas across southern Sweden.
[Stenshuvud National Park – sverigesnationalparker.se](https://www.sverigesnationalparker.se)
- **Overnight at Kiviks Hotel**
The over 100 years old hotel once housed Prince Eugen for three summers in the '30s when he came here to paint inspired by the environment in Österlen.
[Kiviks hotel – kivikshotell.se](https://www.kivikshotell.se)
- **Snogeholm's forestry and landscape laboratory**
We visit Snogeholm's forest and landscape laboratory, established in 1993 to study all Swedish native tree species (plus hybrid larch and hybrid aspen) in 68 different monoculture or mixed combinations. Also at Snogeholm lies the oldest genetic trial with European ash, established in the early 1990's with more than 100 plus tree clones.
[Snogeholm forestry and landscape laboratory \(in Swedish\) – slu.se](https://www.slu.se)



Apple trees in Kivik PHOTO: LOUISE KRAUSE, UNSPLASH

Kivik - The Apple Kingdom

Paradise in Kivik – spring and summer approaches. Nature gives us its spectacle when the lovely apple blossom takes off, the rays of the sun reflects the seas deep blue shades and people from unknown places enjoy the spectacular views and all Kivik has to offer.

In Österlen (east coast of Skåne) lies Kivik – a small village that is also the location of the Bronze Age burial sites of Kiviksgården and Ångakåsen, some of the most significant in Sweden. Today Kivik is the gateway for visitors to the largest orchard region in Sweden. The southern climate is very suitable for apple cultivation: the soil is poor and sandy, but surrounded by the Baltic Sea – the cold springs counteracts premature flowering, but in autumn, the heat stays for a long time; creating perfect conditions for slow ripening and unique taste to our Swedish apples.



Stenshuvud national park and the Baltic Sea
PHOTO: ANTON LÖVGREN, UNSPLASH

Stenshuvud National Park

Stenshuvud National Park is part of Natura 2000 and is one of the most well-known places in the region of Skåne. The national park accommodates many different types of nature in a small area: deciduous forests (oak, beech), pastures, sandy heaths, enchanting alder swamp forest and young, dense hornbeam forest with elements of wide-crowned beeches and oaks, a beautiful sandy beach and even the ruins of a 6th-century fortress. Several hiking trails take you around and from the highest peak of the mountain, an impressive 96 asl, you have a view of the Baltic Sea coast.

Grazing animals which used to dominate the area centuries earlier have been re-introduced to help manage vegetation which otherwise threatens the unique nature of Stenshuvud. Anthropogenic activities also play a role in modifying natural environments. At Stenshuvud and many other protected areas across southern Sweden, *Phytophthora* spp. are causing damage to the trees and high public usage of the parks are likely impacting its dispersal.



Phytophthora spp. damage on European beech.
PHOTO: MIMMI BLOMQUIST

Overnight at Kiviks hotel

The hotel is beautifully situated on a hill above old Kivik with expansive views of the sea. The original hotel building is over 100 years old and once housed Prince Eugen himself for three summers in the '30s when he came here to paint inspired as he was by the environment in Österlen.

Snogeholm's forestry and landscape laboratory

The forest and landscape laboratory is located in Snogeholm's recreational area nearby Snogeholm Lake. This research infrastructure is a result of a cooperation between the Department of Landscape Planning and the Southern Swedish Forest Research Centre (both at the Swedish University of Agricultural Sciences) with the support of regional funds (Region Skåne).

The experiment is unique in Northern Europe. In the southern region of Skåne, there are great opportunities to diversify forests with the choice of tree species to fulfil both economical, ecological and social needs. Snogeholm's forest and landscape laboratory was established in 1993 to study all Swedish native tree species (plus hybrid larch and hybrid aspen) in 68 different monoculture or mixed combinations. Here, we will demonstrate the potential in reforestation by planting broadleaves, using nurse trees and in admixtures of fast-growing trees.



Snogeholm's forestry and landscape laboratory PHOTO: LARS ANDERSSON

Also at Snogeholm lies the oldest genetic trial with European ash, establishing in the early 1990's with more than 100 plus tree clones. Ash populations across Europe have suffered substantial losses since the introduction of the invasive fungus *Hymenoscyphus fraxineus* (causing the disease commonly known as 'ash dieback').



Extensive mortality caused by the ash dieback pathogen *Hymenoscyphus fraxineus* PHOTO: MICHELLE CLEARY

Here we will see and discuss the impact this invasive forest disease has had and current research efforts made to substantially improve the forest regeneration material through careful selection and screening for resistance.



Screening of susceptible and resistant ash genotypes at seed orchard in southern Sweden.

PHOTO: MICHELLE CLEARY

Malmö - the capital of Skåne

The city of Malmö is the perfect blend of old-world charm and ultra-modern cosmopolitan vibes, and this seaside city offers something for everyone. Malmö lies just across the Öresund strait from Copenhagen in Denmark – and is the third largest city in the country after Stockholm and Gothenburg.

Included:

- **Pildammsparken**
We visit the largest park in Malmö with its 45 hectares, and learn more about Sweden's municipal management of greenspaces and trees, as well as ongoing challenges in connection with industry's development and invasive species.
[About Pildammsparken \(in Swedish\) – malmo.se](https://malmo.se/en/about-pildammsparken)
- **The city of Malmö**
The tour ends in Malmö where people may choose to stay longer to enjoy the rich tradition, culture, and entertainment, and/or from the city centre take the 10-minute train ride over the Öresund bridge to Copenhagen.
[About Malmö – malmo.se](https://malmo.se/en/about-malmo)



Turning Torso in Malmö PHOTO: NICK_PHOTOARCHIVE, UNSPLASH

Malmö

A swirl of diversity, a mishmash of old and new, Malmö is one of the most eclectic cities in Scandinavia. Spiraling skyscrapers loom above bustling centuries-old squares, and unassuming brick facades house a treasure of modern artistic creations. The Old Town is an island in the heart of the city, split into two parts: the Gamla Väster district

in the west, filled with historical buildings, and the eastern district, which was revitalized in the 1960s. Wandering the picturesque streets, you'll inevitably end up in Stortorget, the oldest and largest square in Malmö, encircled by beautiful 16th century architecture.

Malmö's Pildammsparken

Pildammsparken with its 45 hectares is the largest park in Malmö. It is located around a system of several old ponds that were created in the 17th century as a water reservoir for the city. Participants will see the beauty of the park and hear about Sweden's municipal management of greenspaces and trees, as well as ongoing challenges in connection with industry's development and invasive species. The

tour ends in Malmö where people may choose to stay longer to enjoy the rich tradition, culture, and entertainment, and/or from the city centre take the 10 minute train ride over the Öresund bridge to Copenhagen.



Pildammsparken PHOTO: KARL HÖRNFELDT, UNSPLASH

Practicalities and registration

For all practical information and registration, please visit the official site of

[IUFRO World Congress 2024 - Post congress tour to Southern Sweden, iufro2024.com](https://iufro2024.com)



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