Report 1/1/2024 – 30/5/2025

Textile Resources in Viking Age Landscapes

TRiVAL

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Introduction

It is a great pleasure to send you the second report to inform you about the work carried out in 2024 and the first five months of 2025. In this report, we have summarised TRiVAL's work and look forward to your comments.

Substantial work has been completed in the three work packages. Charlotte Rimstad has finished the textile registration and analyses, yielding some very interesting results, for example, on which textiles are preserved, and which qualities are the most common in this time and region. Jonas Jæger has completed the analyses of the sheep bone material and obtained valuable aDNA data. Morten Fischer Mortensen and Mette Marie Hald have gathered all evidence for flax pollen in Denmark, and their study will soon be available. Finally, Pernille has registered many different types of textile tools from the selected settlements for the study.

The first results from the three work packages provide new and important insights into textile production during this period, challenging the assumption of an increasing demand for wool. Therefore, we have chosen to focus more on plant fibres than planned. In August, we organised a two-day workshop in Trelleborg to learn about plant fibre preparation and to share knowledge across different disciplines. Furthermore, we have set up the sub-project "Flax, Weights, and Swords: Recreating Weaving with the Warp-Weighted Loom," in which we are testing which textile tools are most suitable for producing flax cloth. This project is being carried out in May–June 2025.

However, there is still much to be done, and we have therefore extended the project until 30 June 2026. This extension will allow us to gather the results in a synergistic manner. Consequently, we have also decided to postpone the final conference to March 2026. We will send more information as soon as we have a date and a preliminary programme.

Finally, I would like to thank the TRiVAL team and advisory board members for your great support in executing this important research project.

Eva Andersson Strand

Eva Andersson Strand, PI

The Project Team 2024-2025

Prof. Eva Andersson Strand is the PI and head of the TRiVAL project. In 2025/2026, her focus will be on registering and analysing tools, compiling all the data from WP1–3, and writing about synergy.

MA Pernille Foss is employed as a research assistant at 50% from January 2023 to December 2024. From 1 April 2025 to late March 2026, she will work one day a week.

PhD fellow Jonas Jæger began his work full-time in September 2022, with two months of parental leave. The DFF has therefore approved an extension of the project period until the end of 2025. He will complete his PhD at the end of October.

Dr Anne Birgitte Gotfredsen is supervising Jonas Jæger, sharing her knowledge and expertise on osteological materials, methods, and analyses.

Dr Morten Fischer Mortensen, Dr Martin Theuerkauf, and Dr Mette Marie Hald are responsible for landscape archaeology in 2025.

Dr Charlotte Rimstad began as a senior researcher full-time on 1 July 2023. Her position was based at the National Museum of Denmark. She has been collecting, recording, and analysing textiles from Danish Viking Age burials. She completed her work at the end of June 2024 but continues to be affiliated with the project.

PhD fellow Lone Gebauer Thomsen has continued sharing her knowledge on textile tools and contexts in Zealand and participating as a member of the project team, especially in WP2.

Research Professor Ulla Mannering, National Museum of Denmark, has been recording and analysing a unique textile find from the wet areas at Trelleborg, Denmark. Furthermore, she shares her knowledge and expertise in textile archaeology at meetings and through her collaboration with Charlotte.

Weaver Marie Wallenberg is a guest researcher and responsible for the new experimental flax co-project.

BA Camilla Fraas Rasmussen has been a student assistant since spring 2024. She is responsible for social media activities, assists with registering tools, and helps plan and execute meetings and conferences.

BA Ranva Ottzen was an intern at CTR in autumn 2024. During her internship, she carried out a small project in which she hand-spun trials of flax and hemp thread. She also drafted a report on the Trelleborg workshop.

BA Sara Ingrid Ketil Eriksson was an intern at CTR in autumn 2024 and is continuing in 2025. During her internship, she assists with registering tools and managing the data.

BA Sunneva Folker Kappel has been a student assistant since spring 2025. She is responsible for assisting in the flax weaving project.

Advisory Board members

Matthew Collins, Section for Evolutionary Genomics, UCPH and Archaeology, Cambridge. Co supervisor for Jonas Holm Jæger.
Dan Bradley, Smurfit Institute, Trinity College Dublin
Charlotte Hedenstierna-Jonson, Univ. of Uppsala and The Swedish History Museum Stockholm
Marianne Vedeler, Museum of Culture History, Univ. of Oslo
Ole Thirup Kastholm, Forskning og kulturarv Roskilde Museum
Ulla Mannering, National Museum of Denmark
Morten Fischer Mortensen, Environmental Archaeology and Materials Science, The National Museum
Torben Birk Sarauw, Nordjyske Museer
Jens Ulriksen, Museum Sydøstdanmark
Anne Birgitte Gotfredsen, consultant and contributor, Globe Institute, UCPH

Administration and general structure

Eva Andersson Strand, Pernille Foss and Camilla Fraas Rasmussen

Regular meetings have been organised. The meetings have focused on the planning of events, recording, and administration.
Eva Andersson Strand has worked on planning and executing conferences, workshops, meetings, and budgets.
Pernille Foss has primarily focused on planning the recording of the textile tools, gathering data, working in QGIS, and facilitating workshops.
Camilla Fraas Rasmussen has been responsible for social media and for arranging and executing conferences, workshops, and meetings.

Figure 1: *Participants in the plant fibre workshop at Trelleborg, working the flax, hemp and nettle fibres.*

WP1 Landscape of Textile Resources

WP1 focuses on the landscape development around the two core areas and the presence of textile plants in the archaeobotanical material from Denmark, respectively. The work in WP1 is carried out by commission at the National Museum of Denmark by Morten Fischer Mortensen, Martin Theuerkauf, and Mette Marie Hald.

To reconstruct the development of the Viking Age landscape and potential changes in the utilisation of the landscape in relation to textile production (mainly that of wool), we aim to quantitatively reconstruct the landscape in the period AD 1 to AD 1400.
Existing pollen data from eight lakes—four from each core area—are used to reconstruct the landscape using "Landscape Reconstruction Algorithms" (LRA). This provides us with a quantitative estimation of the land cover by the most common pollen types and landscapes such as forests, wetlands, agricultural land, and grazing areas. In five localities, it is possible to increase the temporal resolution by analysing more pollen samples; this task has been initiated, and we expect the first sites to be completed this year. The pollen analysis and landscape modelling are conducted by Martin Theuerkauf.

In the second sub-project, we have collected all the published macrofossil finds of textile plants, such as *Linum usitatissimum* and *Cannabis sativa*, along with evidence for dye plants used in textile dyeing. *L. usitatissimum* is by far the most common macrofossil in this group, and the plant has been used for a variety of purposes including food, and in the production of oil and textiles. Often, it is not possible to determine which purpose it was cultivated for, and it may have served all the above functions simultaneously.
Altogether, we have recorded the presence of *L. usitatissimum* on more than 200 archaeological sites in Denmark, of which 30 sites showed evidence of textile production. The presence of *L. usitatissimum* spans the period from the Early Bronze Age to the present day, while the first clear evidence for textile production dates to the Roman Iron Age. The study is carried out by Mette Marie Hald and Morten Fischer Mortensen.

Pollen analysis and quantitative reconstruction of the landscapes around Roskilde Fjord and Limfjorden:
Data from the following lakes have been obtained/analysed: Gundsømaglesø, Ovesø, Store Økssø, Skånsø, Navnsø, Dalby Sø, Lille Gribsø, Store Gribsø, Birkerød Sø, Frederiksborg Slotssø, and Avnsø. The landscape modelling is now underway and is expected to be completed before summer 2025.

Overview of flax finds in Denmark:
An agreement has been reached with Moesgård Museum regarding the use of their data, which will be delivered during the spring. The same applies to Annine Moltsen and the research firm NOK. The goal is to draft an article before the summer holidays in 2025.

Pollen from textiles:
The pollen samples are being prepared and analysed during spring 2025.

WP2 Tools, Textiles and Contexts

PI Eva Andersson Strand, Senior researcher Charlotte Rimstad, Research assistant Pernille Foss, Student assistant Camilla Fraas Rasmussen, Intern Sara

Recording textile tools

Pernille Foss

Textile tools from the selected sites have been recorded and entered into the database. All tools have also been photographed from at least two angles. At present, all tools from sites in Western Zealand have been entered, except those from Trelleborg, where most of the textile tools are on display, and from the central site of Tissø. The latter is problematic, as the finds are not stored in a single facility but across various museums. However, Lone Gebauer Thomsen has graciously offered her records to the TRiVAL project.
The tools from sites in Southern Zealand are yet to be recorded. This will take place in autumn 2025.
In the northern part of Jutland, the Limfjord area, tools have been recorded from all selected sites in the eastern part, except from the circular fort and settlement of Aggersborg. This has been complicated by the fact that all finds from the site are not stored in the local museum but at the National Museum. An application for access to the finds was submitted in April 2025, and we are currently awaiting permission.

In the western part of the Limfjord area, four sites have been included in the project that were not part of the original project description. The reason for their inclusion lies in an expansion of the types of landscape (e.g. closer to the open sea) and types of sites (e.g. not central places). However, due to time constraints, these sites have been given lower priority and will only be recorded if time permits. Below is a schematic overview of the textile tools recorded thus far.

Examples of tools recorded:

TYPE OF TEXTILE TOOL	NUMBER RECORDED
Spindle whorl	359
Loom weight	396
Comb tooth	74
Awl	39
Whet stone (for needles)	96
Needle	67
Needle holder	2
Comb with long teeth	4
Reel	18
Scissors	6
Weaving sword	1
Spindle whorl hook	1
Smoother	3
Lucet	4
In total	**1.070**

Data analysis

Data from the database have been compiled and presented in graphic summaries. As some sites have not yet been recorded, the analysis provides only preliminary results regarding the distribution of types of, for example, spindle whorls, the ratio between diameter and height of spindle whorls, the average weight of loom weights, etc. The preliminary results are shown in the graphs below (incomplete data).

Resources for Viking Age Textile

Charlotte Rimstad

The sub-project *Resources for Viking Age Textiles* in WP2 was launched by Charlotte Rimstad from July 2023 to July 2024 as part of WP2 in the TRiVAL project. The sub-project aims to answer the following questions:

1. Which textiles are preserved from the Viking Age in the two focus areas, and what are their contexts?
2. Which fibres are the textiles made from?
3. What kind of wool fibres were used, and from which sheep breeds?
4. How was the wool sorted and prepared for spinning?
5. Which dyes were used on textiles, and why?
6. Were the dye sources local or imported?
7. What can the overall results tell us about the available raw materials and landscape resources?

Textiles were identified in 45 contexts, most of which are graves. Only one find comes from a settlement context. In total, 156 textile fragments were analysed - 75 from Northern Jutland and 81 from Western Zealand. The textiles were technically analysed, identifying the weave, material, thread count, etc., and samples were taken for wool fibre analysis (44 samples), dye analysis (48 samples), and pollen analysis (22 samples) where possible. The cost of the fibre and dye analyses was kindly funded by the Agnes Geijer Foundation, and the samples will provide information on the textiles' original colours and the raw materials used to produce them.

The technical analyses are complete. Only a few textiles were dated to the Late Germanic Iron Age, around AD 600–700, and the TRiVAL material from this period is dominated by both tabby and twill. More textiles have been preserved from the 9th century, largely because most derive from oval brooches, which were intensively used for the female suspended dress of this period. The period is overall dominated by tabby, which is often found inside or on top of the oval brooches, either as flat textile or as the rolled straps around the needle used to secure the brooches. Tabby is found in greater quantity in Western Zealand than in Northern Jutland. The very fine, balanced tabbies are often made of plant material, though wool tabbies have also been recorded. The 2/2 wool twills are often unbalanced, with a thin, Z-spun warp and a thicker, S-spun weft.

In the 10th century, tabbies almost completely dominate, which is typical across the Danish area. However, we know from other contexts—such as the settlement and harbour in Hedeby from the same period—that twills were used in many and often coarser qualities than what is seen here. New techniques also appear in this period, such as 2/1 twill and brocaded tablet-weaving. From other parts of Denmark, we know that smaller silk pieces were also part of dress in this century; however, this is not very visible in the material, likely due to preservation conditions.

In summary, there appears to be a small difference between the two geographical areas. Tabby seems to have been more intensively used in Western Zealand, whereas both tabby and 2/2 twill were used in Northern Jutland, especially during the 9th century. In the 10th century, tabby dominates, but more specialised techniques also appear, such as brocaded tablet-woven bands and samite silk.

Forty-three samples were taken for fibre analyses, which were carried out during the spring semester of 2024 by conservator Eva Lilja Jensen from the National Museum of Denmark, under the supervision of

conservator Irene Skals. The results are yet to be thoroughly interpreted and combined with findings from the other WPs.

Forty-eight samples were taken for dye analyses, which were performed by Ina Vanden Berghe from the KIK-IRPA Laboratory in Brussels during 2024 (*see Attachment 1 for the dye report*).

The results showed that only about half of the samples contained dyes, and almost exclusively blue dyes (indigotin) were detected. A single flax fragment was dyed blue, and all other tested textiles were wool, mostly 2/2 twills. The results will be presented in a forthcoming article.

Twenty-two samples were taken for pollen analyses, which will be handled by Morten Fischer Mortensen. The results are expected during spring/summer 2025.

Additionally, four feather samples were taken and analysed at the Smithsonian Institution in Washington, D.C., by bird expert Carla Dove. All samples were identified as goose.

The results will be included in various specialised and more general articles on Viking Age textiles, together with findings from the other WPs in the TRiVAL project.

Figure 2 (left): *Rectangular bronze fibula from Brynshøj with textile preserved at the needle.*

Figure 3 (right): *Charlotte Rimstad at work analyzing textiles preserved in graves.*

WP3. Sheep and Sheep Management

Jonas Holm Jæger

Part of 2024 has been spent conducting biomolecular species determinations of teeth and jaws from sheep and goats through ZooMS analyses. This work has presented several challenges due to an unidentifiable contaminant—probably originating from the mass spectrometer. In addition, Jonas has begun work on a major article about sheep herding in the Late Iron Age and Viking Age. He has also participated in the *Sailing Textiles – from Prehistory to Early History* conference in Gothenburg and co-organised a session in collaboration with colleagues from GLOBE and Trinity College Dublin, *Tracing Ovicaprine Lives: Bioarchaeological Perspectives on Sheep and Goat Husbandry*, at this year's EAA in Rome, which was a great success. In parallel, Jonas has supervised a BA student on a project involving ZooMS analyses of sheep and goats from the Early Iron Age.

In 2025, Jonas will travel to Trinity College Dublin to carry out DNA analyses of sheep jaws from Tissø, Vester Egesborg, Aggersborg, and Bejsebakken. The sequenced genomes will be ready during the spring and will subsequently need to be analysed. In addition, further ZooMS analyses must be conducted and, in the longer term, a series of stable isotope analyses of sheep jaws from Zealand and North Jutland will also be undertaken. The remainder of the year will be spent processing data and drafting three or four articles based on these results, before Jonas prepares the cover for his dissertation, which must be submitted at the end of October.

Figure 4: *Jonas Holm Jæger in the laboratory taking samples for ZooMS analysis.*

Other activities

TRiVAL Fibre Processing Workshop

Report on the hands-on workshop at Trelleborg, Denmark, 20-21 August 2024

Ranva Ottzen and Camilla Fraas Rasmussen

Figure 5: *Participants in the fibre workshop at Trelleborg.*

The workshop was arranged as part of the TRiVAL project, in collaboration with Trelleborg Museum and CTR. During the workshop, participants processed and spun plant fibres (nettle, hemp, and flax).

Objectives of the Workshop

- Learn and practise different fibre processing techniques
- Understand and manage waste from fibre processing
- Explore various spinning techniques
- Test different tools used in fibre processing
- Compare the properties of different fibres: nettle, hemp, and flax

Fibre processing methods

Participants tested various methods of processing fibres. The individual choices of tools and materials led to unique end products and experiences.






Figure 6 *(top left): Beating flax fibre with a wooden club to break the stems.*
Figure 7 *(top middle): Breaking the flax stems with a beater (bryder) - a historical technique.*
Figure 8 *(top right): The broken stems are worked with a scutching sword to remove the hard outer parts from the fibres**.***
Figures 9 and 10 *(bottom and middle left): Hackling the fibres - drawing them through metal spikes that are progressively closer together, producing increasingly fine fibres. The spikes help to 'comb' out stem remnants, tangles, and coarser fibres.*
Figure 11 *(bottom right): Flax fibres ready for spinning.*

Flax

The flax stems were whole and retted. They were processed by breaking the outer shells and removing them from the stems. Once removed, participants proceeded to scutch the stems with a scutching sword, thereby further exposing the fibres and removing the remaining shell material. The fibres were then hackled using different combs with varying spacing to smooth the flax and remove the last of the outer shells. Some participants experimented with a metal comb and bristle brush to polish off the final hard pieces of shell. Flax was considered the easiest fibre to process. Each participant's fibres were later spun. The flax fibres left on the hackles, known as tow, were also spun in a separate tow project.

Hemp

As the hemp stems were not intended for fibre production, they were not optimal to work with and had already been broken. Because of this, it was not possible to determine with certainty which part of the stem was being processed. The processing followed much the same method as for flax.
Hemp is longer and coarser than flax, but due to the quality of the hemp used, the fibres became shorter, as the stems had already been cut. It was more difficult and time-consuming to remove the outer bark compared to the other fibres.

Figure 12 (right): *Hemp stems broken after beating.*
Figure 13 (left): *Hemp fibres being hackled, with the stems almost entirely removed.*

Nettle

The nettle stems prepared for the workshop had not dried sufficiently after retting. An attempt was made to dry them using fire, but it was not possible to dry them adequately.
As they could not be dried, we had to use other nettle stems that had been brought along.
The nettles were processed using the same steps as hemp and flax—with minor differences. For hemp and flax, the outer bark requires crushing, and the stems are more flexible and forgiving. Nettle, however, must be split and the bark broken more carefully to avoid fracturing the stems and shortening the fibres.
Nettle fibres are generally shorter compared to flax and hemp; therefore, the heckling process differs, and the yield is sparse compared to the initial material. After the fibres had been processed, they were twisted into a simple two-strand braid to prevent tangling.

Figure 14 (left): *Nettles being dried over a fire*
Figure 15 (right): *Fibre bundles of nettle after processing.*

Flax Spinning

On the second day, it had been raining, and due to the humidity and wet ground, it was difficult to process more fibres. Therefore, we spent the second day learning how to spin flax fibres, as this could be done indoors. We used pre-processed fibres, i.e. not the fibres from the previous day.
The spinning was done using various types of spindles and spindle whorls of different sizes. The fibres were predominantly held in the hand or placed on the spinner's shoulder while spinning. Another method involved fastening the fibres to distaffs of various lengths. The fibres were spread out on the table, rolled onto the distaff, and secured with a piece of cloth to keep them orderly during spinning.


Figure 16 (left): *Dropspindles with different whorl weights next to flax fibres.*
Figure 17 (right): *Flax fibres being prepared for a distaff.*

Results

Participants from all three WPs gained knowledge and shared interdisciplinary insights. Our focus was not only on the processes themselves but also on the residues left behind, particularly in the context of archaeobotany.
Discussions took place regarding the use of various parts of the fibres at different stages of the processes. Knowledge sharing played a crucial role throughout the workshop.
Everyone gained an understanding of how to prepare fibres, how they were used, and what by-products are produced during these processes. Understanding the treatment of fibres is essential for knowing what to look for. This shared knowledge ensures that all members of the project are aligned in their approach and understanding.
The waste products from fibre processing were documented, sampled, and will be further analysed to help identify evidence of fibre processing at archaeological sites.
The workshop expanded our material knowledge of textile craft and illustrated the types of evidence it leaves behind.
Another outcome was intern Ranva Ottzen's tow spinning experiment. The gathered tow from the fibre workshop was hand-spun on drop spindles of various weights.

Participants

- **Eva Andersson Strand**
  - Professor in archaeology and PI in the TRiVAL project
- **Ida Demant**
  - Textile archaeologist and head of the Textile Workshop at Land of Legends in Lejre
- **Morten Fischer Mortensen**
  - Senior Researcher at the National Museum of Denmark, Environmental Archaeology and Material Research
- **Anne Birgitte Gotfredsen**
  - Senior Researcher at University of Copenhagen, Quaternary zoology
- **Mette Marie Hald**
  - Senior Researcher at the National Museum of Denmark, Environmental Archaeology and Material Research
- **Ulla Mannering**
  - Research Professor at the National Museum of Denmark, Prehistory, Middle Ages and Renaissance
- **Charlotte Rimstad**
  - Project researcher at the National Museum of Denmark, Prehistory, Middle Ages and Renaissance and Museum of Copenhagen
- **Marie Wallenberg**
  - Expert weaver and guest researcher at CTR
- **Camilla Fraas Rasmussen**
  - Archaeology student and student assistant at CTR
- **Emma Grarup**
  - Archaeology student and intern at CTR
- **Ranva Ottzen**
  - Archaeology student and intern at CTR
- **Lasse Freudendahl**
  - Archaeology student and intern at the National Museum of Denmark, Prehistory, Middle Ages and Renaissance

Figure 18: *Participants gathering the byproduct of heckling for further studies.*

Plant Fibre Seminar

Flax Production Through Time (*Hørproduktion gennem tiden*)
On 8 November 2024, Kroppedal Museum and the CTR/TRiVAL project organised an interdisciplinary one-day seminar on flax production through time.
The seminar attracted a large number of both speakers and participants, and clearly demonstrated the value of working across disciplines and engaging in interdisciplinary research.
Number of participants: 127 (online and in person)

See attachment 2 for the programme.

Figure 19: *Attendees gathering after the lunch break at the 'Flax Production Through Time' seminar.*

Advisory Board meeting 7 November

Programme:

1. Welcome and Agenda
2. Morten Fischer Mortensen – WP1: Landscape of Textile Resources
3. Pernille Foss – WP2: Tools, Textiles and Contexts
4. Charlotte Rimstad / Eva Andersson Strand – WP2: Tools, Textiles and Contexts
5. Jonas Jæger – WP3: Sheep and Sheep Management
6. Presentations and Publications
7. Future Plans – New Co-Projects
8. Any Other Business

Report on the meeting see attachment 3.

Articles

- **Rasmussen, C.F., Kristensen, N.W., Andersson Strand, E.** (2024). *Flax Production Through Time: An Interdisciplinary Seminar*. Archaeological Textiles Review, No. 66. Centre for Textile Research, pp. 151–152.
  See Attachment 4.

- **Rimstad, C. & Andersson Strand, E**. (2025). *The Viking Age Textiles in the TRiVAL Project*. Proceedings from the NESAT XV Conference, Warsaw 2024 (in press).

Lectures

- Flax Production Through Time, an interdisciplinary seminar, University of Copenhagen - *Morten Fischer Mortensen, Mette Hald*
- NESAT XV, North European Symposium for Textiles, Warsaw - *Eva Andersson Strand, Charlotte Rimstad*
- Centre for Textile Research, University of Copenhagen - *Eva Andersson Strand*
- Archaeology and Science Day, University of Copenhagen - *Eva Andersson Strand*
- Tissø Vikingecentre, Tissø - *Jonas Holm Jæger*
- Sailing Textiles: From Prehistory to Early History, Gothenburg - *Jonas Holm Jæger*
- Sailing Textiles: From Prehistory to Early History, Gothenburg - *Eva Andersson Strand*
- Interdisciplinary Viking Symposium 2025, Copenhagen - *Eva Andersson Strand*
- Interdisciplinary Viking Symposium 2025, Copenhagen - *Charlotte Rimstad*
- Interdisciplinary Viking Symposium 2025, Copenhagen - *Jonas Holm Jæger*
- CTR Lecture on Scandinavian Textile Research 2024, Tuscany - *Camilla Fraas Rasmussen*

Flax, Weights and Swords: Recreating weaving with the warp-weighted loom

Abstract

Within the TRiVAL project, we have begun a weaving test to better understand which textile tools are suitable for producing linen fabric. Our aim is to gain new insights into how the tools and flax fibers interact and identify the important functional parameters. This new knowledge will undoubtedly provide new perspectives on the use of different fibres, which is essential when interpreting textile production at a specific site.

In this new collaborative project, we will challenge the assumption that more tension or weight per thread is necessary when weaving with linen yarns compared to wool. This has been considered common knowledge and viewed as a general fact (Andersson 2003; Mannering 2024). The conclusion has therefore been that heavier loom weights were used to produce linen fabrics and lighter weights for wool fabrics.

This assumption is now being questioned by hand weaver Marie Ekstedt Bjersing, who works with linen weaving on an old treadle loom, and Marie Wallenberg, a specialist weaver on the warp-weighted loom (oral information). Both weavers have experience using light tension when weaving linen fabrics.

In this project, we aim to test different sizes and weights of loom weights in combination with different types of weaving swords. This has previously been done using wool fibres (Wallenberg & Andersson Strand 2025), but no similar tests have been conducted on flax and linen weaving.

The fabric will be made based on a Viking Age original analysed by textile archaeologist Charlotte Rimstad within the framework of the TRiVAL project. The yarn will be spun from linen fibres prepared using traditional methods. The yarn will be spun on a spinning wheel but will match the original in thread thickness and spin angle.

The weaving test will be conducted on a warp-weighted loom, the same type of loom used during the Viking Age. The loom weights are replicas of original loom weights from Hedeby. Three different weight categories, weighing 200 g, 400 g, and 600 g, will be tested together with two different weaving swords. The work will be documented, photographed, and filmed.

Figure 20: *Closeups of the warp-weighted loom being set up by Marie Wallenberg at CTR, 2025.*

Dissemination 2026

The team will record podcasts about the TRiVAL project, interviewing researchers and sharing the content via social media.

Flax, Weights, and Swords: Recreating Weaving with the Warp-Weighted Loom will be filmed and uploaded to YouTube.

Figure 21 and 22: *First trial of the flax setup on the warp-weighted loom at CTR, 2024.*

Publication Plan – To Be Updated

2025: **Vanden Berghe, I., Rimstad, C. & Andersson Strand, E**. 2024. Dyes in the Viking Age textiles from the TRiVAL project. *Journal of Archaeological Science Reports* xx.

Spring 2025: Article in SKALK or Fund & Fortidsminder

2025: **Jæger, J.H**. Zooarchaeology and sheep management based on zooarchaeological source data. Danish Journal of Archaeology.

2025: **Jæger, J.H**. in prep. Results from Zoomanalysis. *Journal of Archaeological Science Report.*

2025: **Mortensen, M. F., Hald, M.M.** in prep. Evidence for flax in prehistoric Denmark

2025: **Theuerkauf, M.** in prep The landscape of textile production, Sealland and Jutland

2025: **Rimstad C.** in prep. The Viking Age textiles in the TRiVAL project. Proceedings from the 42nd Interdisciplinary Viking Symposium 2025

2025: **Jæger, J. H. in prep**. Sailing with textiles. Proceedings from the 42nd Interdisciplinary Viking Symposium

2026: **Andersson Strand, E.** The landscape of textile production in Viking Age landscapes

Project Overview

Project overview as timetable see attachment 5.