



NATIONAL FOREST CENTRE
CENTRE OF KNOWLEDGE TRANSFER AND FOREST PEDAGOGY

IMPLEMENTATION REPORT

Proposal for educational programs and vocational education in forestry

EE_YOUTH

Transfer of knowledge and practical experience in youth education in the field of environmental education and the transfer of knowledge and further training in forestry

Zvolen, 2024

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INTRODUCTION

The significance of forest ecosystems for humans is immense and immeasurable. All the material and immaterial benefits derived from forest ecosystems are fundamental components of human society's existence. In this context, it is crucial to foster and maintain a sensitive relationship between society and forest ecosystems, which must also manifest in people's actions. From the perspective of education and training, environmental education, awareness-raising (hereinafter referred to as EEAR), and forest

According to a survey conducted by therapist Vaculčíaková during Forestry Days 2023, a significant decline in interest in nature-related topics was observed among high school students. This age group rarely visits nature, and they themselves noted that they would need a purpose to engage with it; otherwise, they see no reason to go. Encouraging high school students to develop a relationship with nature can contribute to self-discovery and the prevention of both mental and physical health issues.

The role of environmental education, using forests as an example (forest pedagogy), is not only to enhance awareness of the importance and functions of forests but also to contribute to the development of value orientations compatible with the concept of sustainability. It is also essential to shape positive public attitudes towards forests and inspire society to act responsibly and sustainably in everyday situations.

The Implementation Report is the final output of the project ***“EE_YOUTH: Transfer of Knowledge and Practical Experiences in Youth Education in the Field of Environmental Education and Transfer of Knowledge and Further Training in Forestry,”*** supported by the EEA and Norway Grants under the **Bilateral Relations Fund**. The report was prepared based on an Analysis of the state of environmental education and forestry vocational education in Slovakia and Norway, as well as knowledge gained during a study trip by the project team of the National Forest Centre to Norway. The project partner organization, Skogkurs, hosted the team and prepared an engaging professional and educational program, including visits to Norwegian educational institutions, science and education centres, and specialized secondary schools.

The content of the Implementation Report consists of three educational programs targeting interconnected groups from the perspectives of environmental education and professional forestry training. First, called "LESU ZDAR! - an innovative training program designed for secondary school teachers. Its focus is on deepening, expanding, and innovating the professional competencies of pedagogical staff to enable them to utilize opportunities for collaboration with industry professionals effectively. Second is proposal "LES PRE MLADÝCH (Forest for youth)" - a forest pedagogy educational program aimed at youth (aged 15-19), implemented in the practices of forest educators. The third part of the Implementation Report is a proposal for professional forestry topics for further education of forest owners and managers "NOVÉ VÝZVY V LESNÍCTVE (New challenges in forestry)". The National Forest Centre, Section for Science and Research, Centre will implement proposal into adult education for Knowledge Transfer and Forest Pedagogy, as part of its professional educational and advisory activities.

Special thanks are extended to the authors of the outputs and the "EE_YOUTH" project team, who actively participated in drafting the educational program proposals. We hope their knowledge and experiences will inspire practices in environmental education, awareness, and professional training in

forestry. The specific goal of implementing the educational programs of the "EE_YOUTH" project should not only be what knowledge the participants of the education will take away from the forest, but more importantly their positive experiences and emotions during the education.

Ing. Andrea Melcerová
Project manager

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1. Proposal for innovative education for secondary school teachers

Darina Výbohová, Veronika Jaloviarová, Dagmar Sélešová, Andrea Melcerová

NAME:

LESU ZDAR!

Program annotation	Innovative education is designed as a response to the Recovery Plan, current changes and innovations in education. In addition to inclusive education, the emphasis will be placed on "shifting the focus from the transfer of knowledge to the development of students' comprehensive abilities and supporting the development of the potential of each student." (Basic principles of change - 21st century education). In the future, it will be desirable to include in educational procedures such learning activities in which students can acquire and interpret knowledge and skills in confrontation with real experience in an authentic environment. This will require, among other things, deepening, expanding and innovating the professional competencies of teachers so that they are able to adequately optimize their educational procedures and use the available opportunities for cooperation with practitioners and innovative tools and resources.
Type of education	<i>Innovative education</i>
The extent of education	<i>50 hours</i>
Form of education	combined 32 hours face-to-face (also online), 18 hours of application tasks in distance learning
Educational goals	Support and development of professional competencies of the pedagogical employee in accordance with the relevant professional standard, which will enable participants to optimize their educational practices in the field of scientific literacy and environmental education, as well as increase the level of cooperation with education and training actors and practitioners.
EDUCATION CONTENT	
INTRODUCTION (1 hour) Basic information (schedule, organization and administration of education) and introduction of the NFC provider	
Thematic unit (3 hours): Forest pedagogy (FP) as a part of environmental education in Slovakia. Presentation of the system of environmental education, training and awareness in Slovakia (hereinafter referred to as EVVO), inclusion of FP in EVVO; FP Concept in Slovakia (basic concepts, starting	

points, principles, definition and others); FP activity programs for the target group "secondary school students", Model forest walk - a demonstration of the FP program "FOREST FOR YOUTH" in the form of experiential learning. (note - see pages 15 to 27); familiarization activities and feedback activities in FP.

Causes, reasons and impulses for innovation and optimization of one's own educational practice in the context of curricular changes, conditions, trends in education. (Recovery Plan, Component 7)

Learning activity: reflection on one's own educational practice.

Distance learning task: *Analysis of educational process plans (School Educational Program), selection of topics within educational areas and environmental education.*

Thematic unit 2 (4 hours):

Forest and forestry in Slovakia.

Presentation of key information aimed at deepening professional knowledge in the field of basic biological phenomena of forest ecosystems and principles of forestry with the aim of building awareness of the importance of forests for society. Topics of the professional lecture: Forest ecosystem, fauna and flora of forest communities; Basic information about the forests of Slovakia; Forest management in terms of sustainability and close-to-nature management; The work of a forester - forestry activities; The tradition of hunting in Slovakia; Innovations in forestry.

Workshop endless possibilities (key information aimed at deepening professional knowledge in the field, basic biological phenomena of forest ecosystems and principles of forestry with the aim of building awareness of the importance of forests for society)

- Forest ecosystem, fauna and flora of forests
- Sustainable forest management
- The work of a forester

Learning activity: Working with text and information in the context of different learning styles and strategies (reflection on the experience and design of elements for one's own educational practice when preparing an educational project with an excursion).

Thematic unit 3 (8 hours):

Possibilities of applying FP in environmental education in secondary schools.

Presentation of existing environmental education programs using the example of a forest for high school students from the Lesu zdar! and EE_YOUTH projects. Excursion to a professional workplace using methodological and didactic tools; Presentation of the methodology of individual educational days (content, program structure, organizational arrangements); outputs of individual educational days with a forester; implementation of activities with a group of students in cooperation with a forest educator; presentation of the implementation and evaluation.

Learning activity: Professional lecture, discussion, interview, video excursion (reflection on the experience and design of elements for your own educational practice when preparing an educational project with an excursion).

Learning in the forest workplace, Use of the natural environment, materials in environmental education.

Thematic unit 4 (8 hours):

Learning in the professional workplace

Learning activity: Instruction, practical activity, peer and experiential learning, professional description, reportage (reflection on the experience and design of elements for one's own educational practice when preparing an educational project with an excursion).

Distance learning task: Planning and designing an excursion and learning activities using elements of forest pedagogy.

Thematic unit 5 (4 hours):

Methods to support analytical and critical thinking.

The thematic unit will focus mainly on the areas of ecology, biodiversity and forestry.

Learning activity: Forest café: guided discussion, argumentation and drawing conclusions (reflection on the experience and design of elements for one's own educational practice when preparing an educational project with an excursion).

Distance learning task: creation and updating of learning resources and didactic tools, design of methodology and its application.

Thematic unit 6 (4 hours):

Didactic tools of forest pedagogy

Presentation of didactic tools and their application in the educational process. Suitable forms of cooperation and communication with professional institutions, forest educators when preparing an educational project with an excursion.

Learning activity: Presentation and guided discussion (reflection on the experience and design of elements for your own educational practice when preparing an educational project with an excursion).

Target group	High school teacher
Acquired professional competencies of a graduate of the education program	<ul style="list-style-type: none"> - Interprets the results of pedagogical diagnostics and draws conclusions for the optimization of their educational procedures. - Verifies didactic innovations - elements and principles of forest pedagogy. - Includes their own educational projects in the plans of educational activities. - Creates their own didactic tools and searches for and uses available learning resources using digital technologies. - Evaluates the effectiveness of applied educational and training strategies. - Proposes cooperation activities with forest educators and the professional community.
Quality assurance measures	<p>Personnel Provision:</p> <p><i>The professional guarantor of the education program meets the requirements of Section 55(4) of Act No. 138/2019 Coll.</i></p>

	<p><i>The member and chairman of the commission meet the requirements of Section 56, paragraph 2 of Act No. 138/2019 Coll.</i></p> <p>Author/ Lecturers:</p> <p><i>Forest educators, university teachers, experienced pedagogical employees with first or second certification with at least 5 years of experience in the given field, practitioners with at least 5 years of experience in the given field.</i></p> <p>Material, technical and informational support for education:</p> <ul style="list-style-type: none"> - <i>teaching texts, teaching resources,</i> - <i>recommended available professional texts, methodological materials, audiovisual content,</i> - <i>methodological sheets, worksheets, didactic tools for forest pedagogy,</i> - <i>materials for developing tasks for the distance learning part of education.</i> <p><i>Laptop and data projector for the lecturer with internet connection.</i></p> <p><i>The costs associated with the training will be financed in accordance with Section 63, paragraph 4 of Act No. 138/2019 Coll. Travel costs of the training participant for the final presentation are covered by the sending organization or the participant himself.</i></p> <p>Conditions for completing education:</p> <p><i>Evaluation of the effectiveness of selected elements of forest pedagogy in the proposal of an educational project with an excursion and recommendations at the level of the school subject committees in an agreed structure.</i></p> <p><i>Form: text editor, A4 Scope: 3 - 8 pages, PowerPoint Scope max. 10 slides</i></p>
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1.1 EDUCATIONAL PROJECT “LESU ZDAR!” – project description

The following text contains methodological suggestions and tips on how to successfully prepare and organize the phases of an "educational project" of repeated meetings with a forest pedagogue/forester.

A. QUESTIONNAIRE SURVEY – DETERMINING PRECONCEPTS

The initial activity was carried out in the form of a questionnaire survey, how students perceive topics related to forests, wood, the profession of a forester and forestry. A questionnaire survey was carried out with students from five participating high schools. The teacher will send the "Questionnaire" to the students by email or allow them to fill it out in printed form. The questionnaire needs to be evaluated and, based on the results, communicate the content of the next educational days of the project with forest educators.

Link to QUESTIONNAIRE: [SURVEY OF YOUTH'S PERCEPTION OF FORESTS AND THE ENVIRONMENT](#)

B. ENDLESS POSSIBILITIES – WORKSHOP

The first educational day of the educational project serves to introduce the teacher and forest pedagogue to the group of students and to find out current knowledge and opinions on forests and forestry.

Keywords:	Working with information, collaboration, presentation
Duration:	2 hours (90 min)
Subjects, curriculum topics:	Cross-cutting theme - Environmental education
Activity type:	Workshop
Form and method:	Group work. Division of tasks according to individual learning preferences of group members.

Educational goals:

- **Head (cognitive):** Recall information from memory and acquire new information for the purpose of discussing facts.
- **Heart (affective):** Perceive the interrelationships between humans and the forest environment, how ecological, economic, and social aspects are interconnected.
- **Hands (psychomotor):** Encourage teamwork skills and presentation skills.

Workshop content focus:

The content is given by the thematic focus of questions and tasks (*Annex No. 1, list of tasks*), processed into a presentation.

Organizational arrangements and preparation:

Assess whether the workshop content needs to be adapted for a specific group, adequate time or chosen topic. Consider the number of tasks and their wording, if necessary, adjust the questions in the attached presentation. E.g. variant A (12 questions for 2 lessons) and variant B (6 questions for 1 lesson). Create an e-mail for group outputs e.g. lesuzdarW@gmail.com

Material and tools:

Projection screen and projector, or interactive whiteboard; paper, flipchart, PC, markers, crayons, scissors, newspaper with pictures, string, various fastening materials (adhesive tape, magnets...); if possible, a musical instrument or speakers for the PC or phone;

Annex No. 1 LIST OF TASKS

Implementation structure and recommended time

1. **INTRODUCTION** and introductory information. Purpose, goal and procedure. (5 min.)
It's not a competition, but about creativity, as many observations, information, ideas as possible...!
2. **DIVIDE** into groups and arrange in the room. (5 min.)
Students can be split using a predetermined key or randomly.
3. **READ** the tasks aloud to everyone, explain how the work will be done. (5 min.)
Distribute the paper with tasks (Annex No. 1), tools for completing individual tasks, and start the timer.

4. **AGREEMENT** in the team/group on the division and fulfilment of tasks. (5 min.)
You work as a team/group.
Agree on the procedure and method
You can also go outside to complete the assignments - to the vicinity of the school/school campus.
You have markers, materials, papers at your disposal...
Write the outputs on papers with the group's name and/or send them by email (on the board/in a presentation)
5. **WORKING** in teams/groups. (20 min.)
6. **PRESENTATION** of the outputs of each team/group. (30 min.)
7. **SUMMARY**, additions, answers and conclusion. (20 min.)
At the end, each student can write down a new insight, summary, observation, suggestion, emoticon, etc. on the flipchart. Finally, the teacher and forest pedagogue will request feedback from the students.

C. EXCURSION TO A PROFESSIONAL WORKPLACE

The purpose of the second day with a forester is to introduce high school students to the importance and roles of forestry for society, to visit professional workplaces focused on modern research, innovations and technologies. The excursion is to allow students to directly and critically evaluate a specific reality that they have learned about theoretically, or will learn about.

Keywords:	Professional workplace, forestry, modern technologies, discussion, presentation
Duration:	½ day (4 hours) or full day depending on availability
Subjects, curriculum topics:	Man and Nature, Man and Society – Professional Orientation
Activity type, used method:	Professional lecture, discussion, excursion

Educational goals:

- Head (cognitive): Know the importance and roles of forestry for society.
- Heart (affective): Accept opinions and ask relevant questions.
- Hands (psychomotor): Create an audiovisual recording of the excursion.

Content focus of the excursion:

It is determined by the thematic focus, mission and activities of the visited professional workplace. It will be specified in cooperation with the forestry pedagogue depending on whether it will be a thematic, comprehensive or interdisciplinary excursion.

Organizational arrangements and preparation:

First of all, it is necessary to align the possibilities of students (transport, time interval, group size, etc.) with the possibilities of a particular workplace and ensure a visit in connection with the guidelines "Safety and protection at the workplace". An important part of the event is the active involvement of students during the lecture, or after the lecture in the form of questions. Therefore, this aspect should also be thought out and prepared, preferably together with the accompanying teacher, before the event.

Students can write questions during the lecture on sticky notes or after the lecture on a flipchart. A more attractive, but especially interactive form is asking questions using applications such as:

- **Sli.do** is an application that allows you to engage students in a lecture by allowing them to ask questions that interest them. Participants formulate questions and can also vote for the questions that interest them most. These are ranked according to the vote and answered in that order. Questions are asked anonymously. More at: <https://www.sli.do/>
- **Mentimeter** allows you to create a quick survey at the beginning of a lecture to find out how students think about the topic of the lecture. Or you can create various quizzes that participants have to answer during the lecture, etc. More at: <https://www.mentimeter.com/>
- **Kahoot.it** is an app for creating interactive quizzes on any topic. It can be used to survey what people know and need, or what their values are, so you can set up further activities. More at: <https://kahoot.com/schools-u/>

Material and tools:

Projection screen and projector, microphone or speakers for PC. Paper, sticky notes, flipchart, markers. Provide opportunities to create audiovisual recordings using multimedia teaching tools (mobile phone, Dictaphone and camera, etc.).

Implementation structure and recommended time

WELCOME (15 min.)

Representative of a professional/specialized forestry workplace.

PROFESSIONAL LECTURE (30 min.)

Basic information, knowledge and facts about the workplace and its mission and outputs in the context of forestry. Professions and activities that are applied in the workplace. Qualification conditions and study options. Or is the topic a problem, myth, claim, situation that falls within the scope of the workplace solution.

QUESTIONS from students on the topic of the lecture (30 min.)

Questions can be asked via mobile application.

ORGANIZATIONAL INSTRUCTIONS for moving to the workplace / around the facility (15 min.)

Introduction to the workplace and accompanying persons. Any specific rules of conduct in the facility.

EXCURSION (90 min.)

Processing the output from the excursion - Description of activities at the professional workplace (text, photos).

PRESENTATION: As a follow-up learning activity after the excursion, publishing the created audiovisual recordings - "video excursions" in the classroom as part of integrating the outputs into teaching. On the website of the school and the host institution, or other common platforms.

LEARNING AT THE FOREST WORKPLACE

The aim of the third day with a forester is to introduce students to the work of a forester in the real environment of the forest they care for through experiential activities. By selecting appropriate terrain and

activities, the event will provide students with the opportunity to try out some forestry activities and work with technical equipment.

Keywords:	Field work, forestry, practical activities, technical equipment.
Duration:	All day
Subjects, curriculum topics:	Man and nature, Man and society – professional orientation, Language and communication (outputs)
Activity type, used method:	Instruction, practical activities, peer and experiential learning

Educational goals:

- Head (cognitive): To create an idea and gain authentic knowledge about the profession, forestry and work activities.
- Heart (affective): To show responsibility in relation to living organisms and their environment,
- Hands (psychomotor): To apply work procedures according to instructions and empirical work methods (observation, experimentation, measurement).

Content focus:

The profession and work of a forester in a forest workplace, in the field.

Practical demonstrations and observation of work procedures according to the possibilities of the location and selection, e.g.: *planting of seedlings, cleaning stumps, measuring wood, marking harvested wood, marking trees for logging, throwing away the branches, cleaning the forest, cleaning wells, storing wood in a woodshed, repairing and cleaning pheromone traps, floating wood, collecting pine cones, herbs, wood, starting a fire, and others.*

Presentation of forester's tools: ruler, tape measure, pedometer, greasy chalk, spray, binoculars, forestry map, altimeter.

Practical activity of students: applying/repeating work procedures

Organizational arrangements and preparation:

Take a tour of the site, or get well informed and choose an appropriately challenging terrain accessibility. Provide information about safety, terrain clothing and food. Communicate with forest workers. Reach out to at least two forest pedagogues per group for cooperation. Agree on the division of activities: FP-teacher-foresters (photo documentation, food, accompanying groups, feedback, etc.).

Material and tools:

Tools for work activities (provided by the forestry workplace), protective equipment (gloves, glasses, helmet, etc.), first aid kit, lighter, drinking water, knife, own glasses, snacks.

Task cards, papers, markers and clips for feedback.

Implementation structure and recommended time:

TRANSFER (e.g. bus transport to a location, workplace, forestry enterprise)

INTRODUCTION:

(20 min.)

Welcome, forest pedagogy activities - division into groups, organizational instructions. Any specific rules of conduct in the field.

LUMBERJACK'S BREAKFAST/ SNACK.

(30 min.)

Information from the lives and habits of foresters, lumberjacks. Possibility to choose your own or lumberjack food.

WORK AT FIELD SITE

(90 - 120 min.)

Transfer and work activities / stations. *Taking over tools and materials (hoes, seedlings, measuring instruments, etc.) Instruction and demonstration of the work process.*

Activities: planting seedlings, pruning, anti-bite coating, wood measurement, logging demonstration, forest nursery

BBQ

(60 min.)

Preparation of lunch (goulash, sausages, etc.) instructions for dealing with fire in the forest.

Discussion on the prepared outputs (e.g. reportage, interview, description of the working process...)

REFLECTION AND FEEDBACK**TRANSFER BACK.**

Follow-up learning activity: Working with information and creating outputs individually or in pairs. The students' task is to prepare a report, interview and description of the work. After agreement with the teacher, the school, the outputs can be placed on the web portal of the school, the visited workplace and the NFC.

D. FOREST CAFE - MYTHS AND FACTS ABOUT FORESTS AND FORESTRY IN SLOVAKIA

The aim of the fourth day with a forester is to enable discussion of selected topics and questions related to the joint activities carried out in a relaxed atmosphere at café tables in a simulated or real café. To support group learning of the students involved and team collective knowledge.

Keywords:	Communication, critical thinking, forestry,
Duration:	Educational block (2x45 min)
Subjects, curriculum topics:	Man and nature, Man and society – the world of work
Activity type, used method:	Moderated group discussion

Educational goals:

- Head (cognitive): Know facts and contexts about forestry and forest protection.
- Heart (affective): Critically evaluate information, experience and take a position.
- Hands (psychomotor): Be able to communicate, discuss and present effectively

Content focus:

4 topics were selected for discussion, which were related to activities, lecture topics and survey results.:

TOPIC No. 1:

Agro-resort (MPRV SR SR) asks people to be more considerate in nature. Nature is the home of wild animals, where we are only guests and we should behave as such. In the fields and meadows, young are born in spring, birds nest and crops grow. The increased number of inconsiderate people in nature causes significant damage and death to wild animals.

Questions on the topic:

What is considered and inconsiderate behaviour in nature?

Do you have any unpleasant experiences while in nature?

How did you resolve it? How would you avoid it next time?

What should we be careful about to avoid encounters with wild animals?

Every experience and advice is good 😊

TOPIC No. 2:

More than half of you agree with the statement that "In Slovakia, more wood is harvested per year than grows on trees" and said that it is necessary to increase the scale of no-intervention in Slovakia (the area where wood is not allowed to be harvested). On the other hand, almost a fifth of you disagree with the statement and a tenth think that the scale of no-intervention is large and also suggest changing it.

Questions on the topic:

On what basis did you express your opinion, leaning towards the chosen option in the survey?

How can you justify your claim and proposal? Support it?

TOPIC No. 3:

As part of the evaluation of the questionnaire survey "Students' Perception of Nature", respondents stated the following preferences (note: the given percentages are the output of an actual survey with high school students from 2023):

Live Christmas tree - **artificial Christmas tree** - almost half (49.54%).

Stone floor - **wooden floor** - preferred by more than half (65.14%).

Cinema - **campfire** - indicated by half of the respondents (52.29%).

Shopping in a shopping center - **Walk in the forest** - preferred by almost three quarters (73.39%).

Bath in the bathtub - **quick shower** - preferred by more than half (62.39%).

Silicone - **wooden spoon** - indicated by almost three quarters of the respondents (70.64%).

Computer game - **book** - preferred by more than half (59.63%).

Questions on the topic:

Can you justify your choice?

Which alternative do you think is more environmentally friendly and beneficial, and why?

TOPIC No. 4:

In your opinion, in order to improve the quality of the environment and life in Slovakia, it is necessary to make these three changes in particular:

1. (46.79%) - **Increase civic responsibility and engagement in the environmental field.**
2. (41.28%) - **Reduce erosion and air pollution.**
3. (35.2%) - **Reduce or stop tree felling.**

Questions on the topic:

What does this mean in practice? How and what will it affect? Why do you think it will help?

Describe how you can specifically apply any of the above options in your daily actions? Are there any negative consequences of such measures?

Organizational arrangements and preparation:

To carry out the activity, it is recommended to find a suitable environment and arrange it so that the participants can move around easily. Each table should ideally have four chairs - and no more than five. In a real or simulated café, where participants have access to small refreshments such as tea, coffee, cookies, etc. The number of tables depends on the number of participants and groups. If possible, space for presentations. Clearly clarify the purpose of the meeting and discussion. Formulate topics and questions for individual tables that are meaningful and will help to explore and get to know the topic being addressed from different angles, uncover as many aspects, components or possibilities etc.

Material and tools:

Small (round) tables covered with paper tablecloths, notepads, coloured pens – markers.

Projector, screen, cards with “Forest café ethics” rules.

Forest café ethics

Focus on what is important.

Name what works or has worked in the past.

Contribute your own opinions and perspectives.

Speak and listen with your heart and mind.

Listen to others in a way that truly understands.

Be specific, don't generalize.

Connect ideas and thoughts, get inspired by colleagues (including the previous group).

Pay attention to discovering new knowledge and deeper questions.

Play, draw, paint - writing “sketch noting” on tablecloths is recommended.

Have fun!!!

Implementation structure and recommended time:

RULES AND ETIQUETTE: (10 min)

Organizational guidelines. At each table, one group member is designated as the host. He/she remains at the same table at all times. The host begins by warmly welcoming the other “table guests” by putting the participants at ease. He/she then introduces them to the Forest Café process, setting the context, and sharing discussion etiquette.

ROTATION OF SMALL GROUPS: (40 – 60 min)

The process begins with the first of three or more 10-20 minute rounds of small group discussion of four (maximum five) people seated around a table. At the end of the time interval, each group member moves to a new table. The “table host” for the next round welcomes the next group **and briefly informs them on what was said on the topic in the previous round** (group).

Questions: Each round is preceded by a question specifically **designed for the specific context and desired purpose** of the Forest Café. The same questions can be used for more than one round or can be linked to each other to focus the conversation or guide its direction. For example, at each table, a question is directed at a different aspect of the chosen topic.

SUMMARY: (20 - 30 min)

After the small group discussions (and/or between rounds, as appropriate), the “hosts” are invited to share insights or other results of their discussions with the rest of the large group. These results are visually displayed in various ways, most often by means of a graphic recording at the front of the room. Reflection, constructive criticism and suggestions are expected. As part of the hosts’ summary, any member of the group/team may add to, emphasize or explain the presented outputs. **The final discussion is usually led or facilitated by the group/team leader or a pre-agreed person.**

REFLECTION *Creating a draft post for a social network (FB)*

(10 min)

It is important to evaluate the implementation of the educational project by teachers, forest pedagogues and students after the completion of the planned activities. Purposeful and systematic **self-reflection** prevents routine and allows the teacher to verify new procedures for working with students, leading to modernization, rationalization and efficiency. Consciously processed and evaluated experience teaches to anticipate possible consequences of action when repeating what has been experienced and thus optimizes the teacher's activity. Self-reflection is an *analysis of the quality and effectiveness of the planned educational project (teaching) in order to improve the quality of work and achieve better effects, or optimize the teacher's procedures and actions*, it is part of the professional self-concept and informal self-education and a systemic part of the teacher's professional growth.

LIST OF TASKS AND ACTIVITIES

1. Find out what the abbreviations can mean: FAO, IDF, LE, TUOL, LOS, NLC, LP
2. Describe the month of April. What do you as a student do during this month and what do you think a forester does in his work in April/spring (after the meeting date)?
3. Find 5 pieces of different coloured and diverse natural material. Describe it in words.
4. Find out on the Internet 3 interesting facts about the forests of Slovakia, 3 about the forests of Europe, 3 about the forests of the world.
5. Find and save 4 pictures of the forest in its various forms to your mobile phone and then send them to the agreed email address to the forest pedagogue. Briefly comment on your choice during the presentation.
6. Learn the definition of the term FOREST.
7. Give 5 reasons why it is necessary to educate yourself about nature.
8. Give 3 examples of subjects from different subjects that you could learn more interestingly or better in the forest..
9. Write a 4-stanza poem titled Forest Learning.
10. Design a logo (and a slogan if you want) for the project LESU ZDAR!
11. Build a educational tool from collected natural materials that you could use in your classroom.
12. As a group of 2 (3, 4,...), create a joint choreography to a song of your choice with a theme related to the forest or nature, which you sing or play from your mobile phone..

2. Forest pedagogy educational program for the target group YOUTH

(Andrea Melcerová, Veronika Jaloviarová., Dagmar Sělešová, Anna Lena Albertsen)

2.1 ANNOTATION OF THE EDUCATIONAL PROGRAM

Target group: YOUTH (15 - 19 years old)

Implementer: forest pedagogues with a certificate of completion of the accredited Forest Pedagogy educational program (NFC)

Goals of forest pedagogy

- To present the forest as a unique classroom through experiential games and activities
- To communicate topics related to forest ecosystem services
- To motivate responsible behaviour and conscious action towards the environment
- To present forestry as a modern and developing sector of the national economy, providing solutions to mitigate the impacts of climate change on nature and society

2.2 METHODOLOGICAL GUIDELINES

Forest pedagogy (hereinafter FP) as a part of environmental education can contribute to the development of environmental literacy of children and youth through innovative methods of education in an authentic forest and nature environment. Participants in forest pedagogy programs, based on their own experience, acquire new knowledge and develop skills that can be used for pro-environmental actions in everyday life, thereby creating a sensitive relationship to nature and the environment.

The content of the educational program FP "FOREST FOR YOUTH" is a proposal for planning and implementing activities suitable for the target group of youth aged 15 - 19. The forest pedagogy activities listed for a given target group can be implemented during one meeting, or selected from them and a program can be compiled according to the time available for its implementation.

Recommendations for forest pedagogues when planning a program of forest pedagogy activities:

- When compiling a program of forest pedagogy activities, the forest pedagogue should adapt the selection of activities to the character of the educational group. He takes into account the level of knowledge of the participants in the FP program, their number and time schedule.
- It is recommended to compile the FP activity program according to the FP methodology (HEAD – HEART – HANDS), and to maintain the following dramaturgy of the FP program implementation:
 - familiarization activities
 - forest pedagogy activities on the chosen topic
 - feedback activities
- The topics of the educational program FP "FOREST FOR YOUTH" also require the expansion of new knowledge of forest educators on the given issue, available in professional forestry publications, on web portals or in the offer of further education of the National Forestry Centre.

- After the implementation of the proposed activities, it is recommended to evaluate the program, through reflection from the participants, and also from the perspective of the self-evaluation of the forest pedagogue.

2.3 TOPICS OF THE EDUCATIONAL PROGRAM "FOREST FOR YOUTH"

- THE FOREST AS A SOURCE OF KNOWLEDGE
- FOREST ECOSYSTEM SERVICES
- FORESTRY PROFESSION

2.3.1 FOREST AS A SOURCE OF KNOWLEDGE

a) Forest gallery

(author: Andrea Melcerová)

Activity objective: getting to know the group; reflecting on knowledge; discussing diversity

Estimated duration: 10 minutes

Equipment: printed colour pictures or photographs (A5-A4 format), twine/rope, wooden pegs



Fig. 1 Activity of the FP "Forest Gallery" (Source: NFC archive – CTPLP)

Activity progress:

The forest pedagogue prepares and prints a series of different coloured pictures or photographs with the theme of forests and forestry. It is also advisable to laminate the pictures. The pictures are hung using wooden pegs on a prepared rope tied between the trees (Fig. 1), or around the perimeter of the room where the activity is taking place. The task of each participant in the activity is to look through the gallery of pictures and choose one of them that best describes the sentence: "Why I love the forest". The forest pedagogue invites the participants to introduce themselves by name, state which picture they have chosen, and describe what is in it. It is important that they say why they chose the picture. The group discusses the topic of the diversity of nature, ecosystem services of forests and forestry activities.

Recommendations:

- Pictures and photographs should capture the diversity of flora and fauna, the uses and benefits of the forest, and also forestry activities.
- The activity can be carried out indoors, when the rope and pictures are placed around the perimeter of the room.
- The picture gallery can also be prepared according to a specific theme (trees, forest microworld, people in the forest, etc.).
- The activity can be dramaturgically included not only when getting to know the group, but also at the end of the program.

a) Invitation to the forest

(author: Andrea Melcerová)

Activity goal: development of perception of nature and creativity

Estimated duration: 15 minutes

Equipment: worksheet Invitation to the forest (see below) printed on a drawing (200 - 250 gsm), A5 format; pencils/coloured crayons, pads, forester's hat.

Activity progress:

The forest pedagogue will welcome the participants of the program in his forest, which is not only his work, but also his home and refuge. He invites the participants to take a short walk/exploration of the selected place. He explains the tasks of the worksheet "Invitation to the Forest" and frees the group to complete them, while each participant can also take a pad and writing utensils. After the work is done, the group meets and everyone puts their "Invitation" into the forester's hat. This is followed by drawing lots for the "Invitation" and finding the place described on it.

Recommendations:

- *It is advisable for the forest pedagogue to choose a stimulating place for the implementation of this activity, with interesting landscape elements, a mixture of tree species, rich biodiversity, etc.*
- *The forest educator acts as a guide to the activity, but can also participate, it is advisable for an even number of participants to participate in the activity.*

Worksheet "Invitation to the Forest"

Annex no. 2 - Worksheet for the topic "Forest as a source of knowledge"

WELCOME TO THE FOREST

1. Look around you and try to find a place that is special to you. Look around, walk around, and then find a place where you can sit comfortably and take in the nature around you.

2. What is the first thing you notice about the place you have chosen?

3. How do you feel in this place?

4. Come up with an interesting name for your place in the forest.

5. On the back of this sheet, draw/sketch your place and create an invitation to your special place.

I HOPE YOU FELT PLEASANT IN THE FOREST

INVITATION TO THE FOREST

.....

a) What is written in the wood of our forests?

(author: Andrea Melcerová)

Activity goal: to develop knowledge about the influence of weather on tree growth and wood quality

Estimated duration: 15 minutes

Equipment: cross-section of wood with visible tree rings, wooden medallions, magnifying glass, crayons, printed picture with examples of the influence of the environment on tree growth and tree ring formation (Fig. 2)

Activity progress:

The forest educator will introduce the topic and interesting facts about tree growth and wood formation. On a cross-section of wood, he will clearly show where the wood is oldest, where it grows and count the number of annual rings. Participants can search for and compare the information on wooden medallions, which also have legible annual rings, they can use magnifying glasses or trace the annual ring with a pencil. Using the illustrative picture, they can compare and discuss the effects of the environment on the growth of the annual rings of their wooden medallions.

What can be written in the wood of trees? (task proposal for the activity)

- - How many years has this tree been growing?
- - Is it possible to find a tree ring from the year you were born?
- - Are all tree rings the same?
- - Mark with a pencil a wide and a thin tree ring, an irregular tree ring, and a tree ring with visible deformation?
- - What can affect the growth and formation of wood and how can you find it in the picture? Try to compare the tree rings according to the picture and name what influenced their growth.
- - What is the name of the modern scientific method that studies tree rings? Make up the name of this science from the jumbled syllables: **DRO LO CHRO DEN NO GY**

Recommendation: The forest pedagogue can print out the shuffled syllables on a separate sheet of paper. The group can search for the correct name together or in groups.

Annex no. 3 – Worksheet – “What is written in the wood of our forests?”

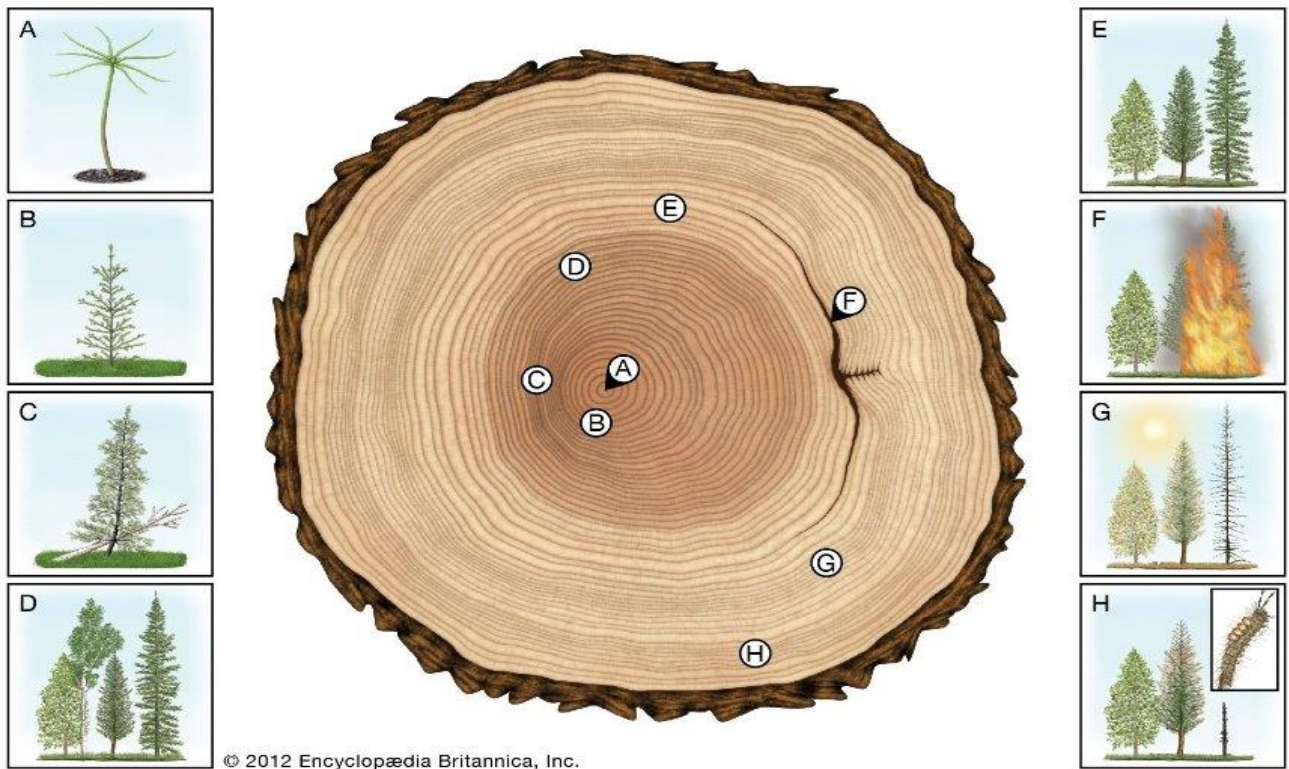


Fig. 2 The influence of the environment on the growth and formation of tree rings (Source: Encyclopedia Britannica, Inc., 2012)

2.3.2 FOREST ECOSYSTEM SERVICES (ES)

a) What does the forest give us?

(Inspired by the European Congress of the FP, adapted by Andrea Melcerová)

Activity goal: developing knowledge about the services, uses and benefits of forests for society, developing creativity through working with natural materials

Estimated duration: 20 minutes

Equipment: natural materials and a card with a description of ecosystem services

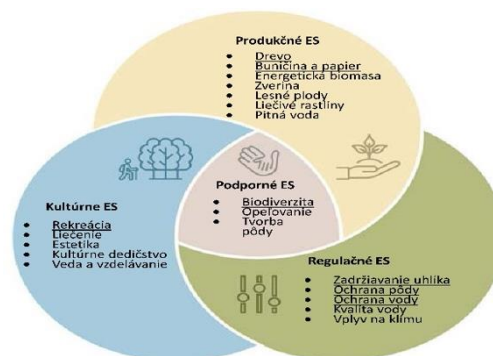


Fig.3 Forest ecosystem services (Source: Kramer et al, 2022, modified)

Activity progress:

The participants of the activity create a larger circle. For better orientation in the terrain, it is advisable to create the circle more permanently, for example by laying it out of natural material, or by rubbing it with shoes, which gently exposes the soil without natural material. The forest pedagogue divides the group into three smaller groups. The first task of the group is to create its own circle in the large circle from natural material - all three smaller circles should be approximately the same size and touch the circumference of the large circle. The forest pedagogue presents the distribution of forest ecosystem services (ES) through a picture (Fig. 3). Then, each group is given a card with the name and a short keyword description of the ES (see card below). The task of each group is to build a 3D model from natural material that represents the ES that was assigned to the group. The groups do not know which ES they are working on. The activity is evaluated together. The groups identify and describe the individual ES models to each other. During the evaluation, the forest pedagogue will point out the interconnectedness of individual ES and add information about the importance of forestry and the work of foresters to ensure that all ES of the forest are protected and biodiversity develops as a supporting ES of the forest.

FOREST ECOSYSTEM SERVICES

Cultural ecosystem services – education and science, tourism - recreation, aesthetics, healing, natural cultural heritage



Production ecosystem services – wood and wood products, forest fruits, game, medicinal plants, drinking water, pulp and paper



Regulatory ecosystem services – water and soil protection, water quality, carbon sequestration, climate impact



b) How much carbon do trees store?

(Inspiration from Norway adapted by Andrea Melcerová)

Activity goal: develop mathematical skills through measuring trees, comparing measured data with estimates, expanding knowledge about the role of trees in storing carbon.

Estimated duration: 30 minutes

Equipment: ruler, Christen altimeter with tape and 2-meter batten/stick, worksheet "How much carbon do trees store?" pencils, pads, log volume tables/mobile phone with internet

Activity progress:

The forest pedagogue will introduce the participants to the topic of modern approaches in forest management, taking into account the support of ecosystem services of the forest for society. One of them is carbon sequestration. Since this is a challenging issue, it is important to present the topic simply, without complex theories. The follow-up activity is the presentation of the forestry activity "Measuring standing trees", the aim of which is to introduce tools for measuring trees and wood mass, with a connection to environmental awareness of carbon sequestration by trees. Participants can work individually or in smaller working groups. An important part of the activity is comparing estimated values with measured ones.

Interesting information on the issue of CARBON STORAGE

- Carbon occurs in forest ecosystems in various forms. In living biomass, it is mainly cellulose molecules and other organic compounds that form the basic structural and metabolic components of plants and animals. In dead biomass, carbon undergoes gradual transformation into simpler compounds, or is released into the atmosphere in the form of carbon dioxide (CO₂) (respiration) or methane (CH₄) through a process that takes place with the help of special bacteria in places without access to oxygen (e.g. wetlands).
- Carbon enters forest ecosystems almost exclusively through photosynthesis by green plants, where CO₂ is assimilated and converted into organic compounds. These compounds are then stored through other processes such as growth (biomass growth) and the formation of durable substances such as cellulose. The decomposition of cellulose produces organic compounds that contribute significantly to the long-term accumulation of carbon in the soil.
- Carbon can be found in an ecosystem in two main forms:
- Stable forms: This is carbon bound in living biomass (heartwood), soil organic matter (humus) or in dead wood with a slow rate of decomposition. Unstable forms: Carbon bound in living biomass or in decomposing dead biomass (e.g. leaves, fine roots). These forms are constantly in circulation through photosynthesis, respiration, and decomposition.
- Carbon is released from the forest ecosystem into the atmosphere or hydrosphere in several ways: Respiration: The largest share of carbon emissions is the respiration of living organisms (plants, animals) and soil microorganisms that decompose dead biomass. Leaching from soil: Carbon can enter the hydrosphere or even the lithosphere through soil solution. Extreme events: Fires, wind disasters or mass die-off of large parts of the forest.

- Undisturbed forests (e.g. old-growth forests or natural forests) are generally carbon neutral. This means that the amount of carbon bound in the ecosystem is in balance with the amount that is released.
- What are effective carbon-friendly management measures? 1. Artificial restoration of forests with low carbon stocks but high-quality soil (creation of new large-capacity carbon storages); 2. Introducing forest elements into the agricultural landscape, i.e. agroforestry measures; 3. Close-to-nature management practices, aimed at preserving the forest microclimate, protecting rare habitats and supporting continuous forest regeneration; 4. Protecting the water regimes of wetlands and peatlands and supporting water capture and retention in the forest, which positively influences and increases the growth of woody plants during dry periods (Ameray et al., 2023)
- Which forest captures the most carbon and which stores it the most safely? The highest carbon capture is in forests in the thinning phase (stump and thin trunk), which have the highest biomass growth and thus the highest carbon capture. The safest carbon storage is in multi-storey forests with a structure close to nature, where small-scale restoration interventions are applied. These systems maintain a stable microclimate, reduce soil erosion and protect humus reserves (Bošela et al., 2023)

According to the sources mentioned, adapted by Jerguš Rybár, NFC – FRI Zvolen

HOW MANY KG OF CO₂ DOES A TREE RETAIN??

1. In the designated area of the forest, **choose a TREE, determine and write down** what type of tree it is:

Name of tree species:

2. Estimate and measure:

Tree height

Estimate:.....m actual height:..... m

Tree diameter (in 1,3 m)

Estimate:..... cm actual height:cm

3. Estimate and calculate:

Tree volume – enter height and thickness into forestry volume tables or use <https://www.drevvari.sk/wood-calculators>

Wood volume:

Estimate..... from tablesm³

4. Calculate the weight of the wood (approx.)

.....

Light wood species (spruce, fir, pine, poplar)	400 – 500 kg/m ³
Moderately heavy (willow, larch)	500 – 600 kg/m ³
Medium-heavy (birch, ash, oak, beech)	600 – 700 kg/m ³
Heavy woods (acacia, hornbeam)	700 – 1000 kg/m ³

.....

5. Weight of wood = Volume of wood in m³ x weight on 1m³

Estimate:.....kg calculation:..... kg

6. How much carbon does a tree retain?

The mass of carbon (C) is 44% of the total mass of the tree:kg

Weight CO₂

Carbon (C) forms in the molecule CO₂ 27%, therefore the mass of carbon C, we divide by the number 0,27 =

Your tree in height of m with diameter of cm store kg of CO₂

2.3.3 FORESTER'S JOB

c) Forest fire

(Inspired by the European Congress of the FP, adapted by Marián Taraba)

Activity goal: to introduce the physical demands of firefighting through an experiential game

Estimated duration: 10 minutes

Equipment: 5-10 green caps, 5 red/orange scarves/t-shirts, 3-5 flytraps



Fig. 4 FP activity – Forest fire (Source: archive NFC – CTPLP)

Activity progress:

The participants are divided into groups: those who will represent standing trees in the game will put on green caps, those who will represent fire - fire - will put on T-shirts, and those who will extinguish the fire - firefighters will take the flytraps. The game begins with the placement of the participants in the field. The "trees" are placed anywhere on the field. After the signal is given, the "trees" stand still and the "fire and firefighters" run away in the field. The task of the "fire" is to knock the green cap off the head of the "tree", which in the game represents setting the tree on fire. The task of the firefighter is to run to the fire and prevent the trees from being set on fire using the flytrap. The firefighters use the flytrap to gently "pat" the "fire" teammates on the body, thus preventing the "trees" from being set on fire, smothering the fire. These players do not continue the game and cannot set other trees on fire. The game ends when all the "trees" are set on fire, i.e. all the green caps are on the ground. Or the "firefighters" have prevented the trees from being set on fire, i.e. the "firefighters" have reached the "fires" and extinguished them all. The difficulty of the game can be regulated by changing the ratio of players involved in the game.

d) The destiny of forests is in our hands

(Inspired by the European Congress of the FP, adapted by Igor Vizlai)

Activity objective: developing critical thinking and decision-making on issues related to forestry and nature conservation.

Estimated duration: 15 minutes

Equipment: rope/twine 500 m, printed tables with text laid out (Annex No. 1)

Activity progress:

A forest pedagogue in the forest, using standing trees, places and hangs decision boards and creates a rope net according to the specified scheme (see Annex No. 1). The task of the activity participants is to decide and choose a method of solving a given environmental problem after reading the text on the board. Then, according to the instructions on the board, move to the next station with the

next task. Through successive decisions, the participants work towards a result, which is the consequence of forestry activities or a non-interventionist approach to forest care. After completing the activity, the forest educator can invite the participants to reflect and evaluate their decisions in solving environmental challenges.

e) Forest quiz

(author: Andrea Melcerová)

Activity goal: verification of knowledge and attitudes, reflection on the implementation of the educational program

Estimated duration: 15 minutes

Equipment: prepared quiz, pencils (online version available at kahoot.com)

Activity progress:

The forest quiz activity is a fun reflection of students on the acquired knowledge and attitudes that they had the opportunity to perceive during the completed forest pedagogy program. The forest pedagogue can decide the method of implementing the forest quiz according to the time available. It is also up to the discretion of whether the forest quiz will have a competitive nature for individuals or will be solved by groups (3-5 members). It is advisable to adapt the wording of the questions to the content of the educational program and its activities.

Proposal of questions for the forest quiz for the target group of youth (15-19 years).

FOREST QUIZ "FOREST FOR YOUNG PEOPLE"

1. 1. What is the forest cover of Slovakia (according to the Forest Management Report for 2024)
 - a) 37,8 %
 - b) 41,4 %
 - c) 54,5 %
2. Who do foresters consider the Father of Slovak forestry?
 - a) Ferdinand Coburg
 - b) b) Joseph II, husband of Maria Theresa
 - c) Jozef Dekrét Matejovic
3. What is the name of the method for investigating the influence of the environment on wood growth?
 - a) dendrochronology
 - b) bio resonance
 - c) taxation
4. Which forest tree species is most abundant in Slovakia??
 - a) Spruce
 - b) Oak
 - c) Beech

5. 5. Which of the forestry measures significantly contributes to increasing carbon stocks in forests?
- a) Close-to-nature silviculture measures
 - b) Cleaning forest trails
 - c) Access to the forest via forest roads

Recommendations for feedback

- *At the end of the implementation of the FP educational program, the forest pedagogue will invite the participants to express their feedback. The participant can express the most interesting insight that he learned during the implementation (e.g., wetlands and peatlands play an important role in binding carbon in nature), or the forest pedagogue will invite the participants to describe their feelings about participating in the FP program in one word or phrase "e.g. interesting; new; other...).*
- *At the end of the implementation of the educational program, the forest pedagogue will thank the group of participants for their attention and cooperation and motivate them to be more sensitive during visits and stays in the forest.*

TABLE 1

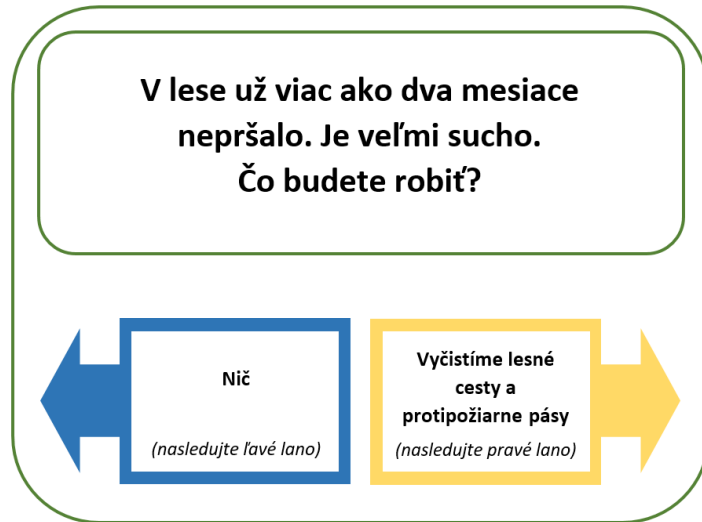


TABLE 2 a 8

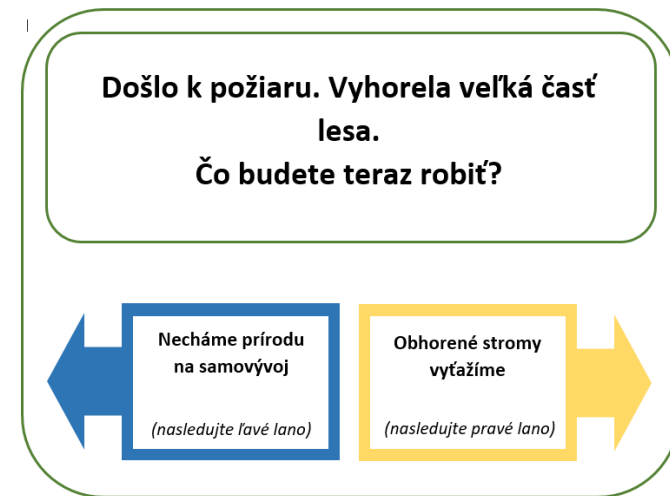


TABLE 3 a 9

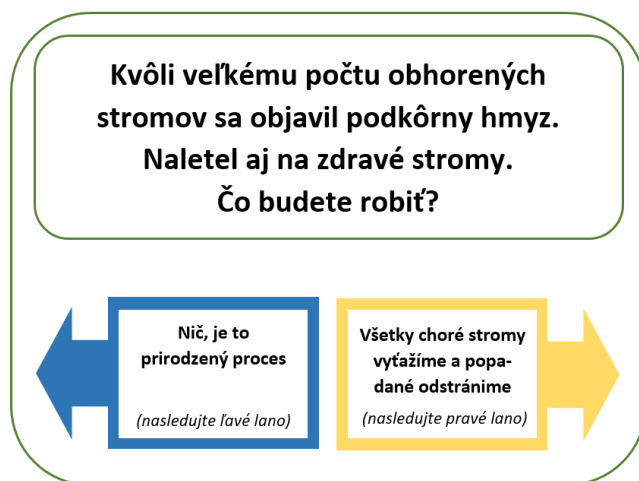


TABLE 4 a 10

Postupne uhynuli všetky stromy, zvieratá a vtáky odišli. Prišla prietrž mračien a začala erózia pôdy, nič tu nerastie. Neďalekú dedinu postihla povodeň a zničila domy miestnych obyvateľov.

Keď sme nečinní a nezaujímame sa o problémy lesa, veľmi často sa premenia na naše existenčné problémy. Vráťte sa na začiatok a skúste urobiť iné rozhodnutie!

TABLE 5 a 7 a 11 a 12

**Gratulujeme! Zachránili ste les pred úplným zničením. Na holine sa však les neobnovuje.
Čo budete robiť?**

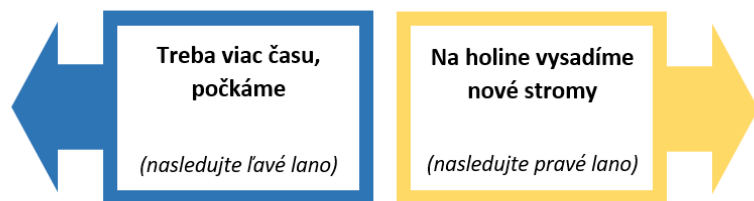


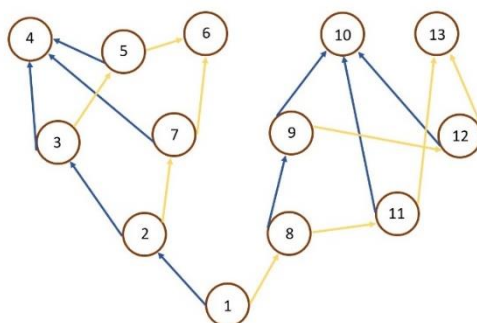
TABLE 6 a 13

Mladé stromčeky, ktoré ste zasadili, rastú dobre. Zvieratá, ktoré utiekli po vyťažení stromov, sa vrátili. Popri stromoch na ploche rastie tráva a kríky.

Pôda je stabilizovaná a kvôli rozhodnutiam, ktoré ste urobili, nehrozí erózia pôdy a záplavy.

Takéto rozhodnutia robia lesníci každý deň pre dobro lesa.

SCHEME OF CREATION OF NETWORK AND LAYOUT OF DECISION TABLES



3. Proposal for vocational education activities "New challenges in forestry"

(Katarína Bugalová, Petra Gulašová, Milan Sarvaš, Marián Taraba, Bjørn Helge Bjørnstad)

3.1 ANNOTATION

The developed proposal for further education activities reflects global trends in the field of lifelong learning. The content of the proposed areas reflects the needs of forestry operations, taking into account the current challenges of the forestry sector in Slovakia. The individual topics included in the proposed educational areas are selected with regard to the long-term requirements of participants in the NFC - CTPLP educational activities, which are regularly surveyed through questionnaire surveys.

Target group: forest owners and forest managers

Education and knowledge transfer provider: National Forest Centre

Education objectives:

- Develop knowledge in the field of current professional forestry topics focused on addressing climate impacts on the natural environment
- Convey knowledge from current research and science into forestry practice
- Introduce innovative approaches and modern technologies into forestry practice
- Develop positive communication of the forestry sector towards the general public

Thematic areas of education and their description:

1. Vocational education focused on acquiring practical skills:
 - Close-to-nature forest management
 - Forest management to support the capercaillie
 - Wildlife damage to forest stands
 - Prevention, management of the introduction and spread of invasive alien species
 - Wood sortimentation
 - Forest fires
2. Professional education focused on working with data and information and communication technologies:
 - Information systems in forestry
 - Modern technologies for increasing the efficiency of working with data in forestry primary production
3. Education focused on developing communication and other soft skills

3.1.1 Close-to-nature forest management (CNFM)

The state and structure of forests in Slovakia are significantly disturbed in connection with the ongoing climate change. The deterioration of their health, vitality and overall ecological stability is determined by long episodes of drought, torrential rains and winds. Of the biotic factors that cause disturbances

mainly in regeneration processes, the most significant are high numbers of ungulates. A current problem is also the ongoing decay of spruce stands, especially in non-native habitats, which reduces its representation within the forests of Slovakia (SANIGA, BRUCHÁNIK; 2023).

The impact of these serious factors forces us to look for cultivation solutions that would slow down or stop the unfavourable situation in forests, improve their physiological activity and maintain their health. One of the key ways to solve this situation is to understand the natural laws and processes in forest ecosystems and make the most of them when designing cultivation practices, with the aim of improving the health of forests. These cultivation practices are an integral component of close-to-nature forest management (CNFM), which became a legislative part of Act No. 326/2005 Coll. on Forests, after its amendment in 2020. This amendment to the Forest Act introduced a new method of management, which is aimed at gradually changing the forest of age classes to the forest of thickness classes.



Figure 3. Mosaic structure of forest cover (photo: Milan Sarvaš)

Educational activities are aimed at presenting innovations and new practices towards more gentle forms of management in the main tree species mixtures of Slovak forests. They offer participants an up-to-date overview of legislative changes related to forest land management. Practical demonstrations of practices and visits to demonstration facilities serve as a confirmation element of the acquired knowledge.

Table 1: Content of the educational training - "Close-to-nature forest management" "

Close-to-nature forest management			
Total duration:		8 hours	
Practical part:	4 hours	Theoretical part:	4 hours
Topics:	legislative changes in the field of forest management		
	innovations, new knowledge in the field of forest management		
	practical demonstration of CNFM procedures, examples of good practice		

3.1.2 Forestry management to support the capercaillie population

The capercaillie (*Tetrao urogallus*) population in Slovakia has shown a significant decline in abundance in recent decades. One of the main factors of this unfavourable situation is also the reduction of the area of habitats suitable for its survival. The optimal habitat of the capercaillie is formed by open alpine forests with a specific habitat structure. Based on examples from other European countries, in order to stop the further decline in the species' abundance, it is important to implement - in addition to passive protection of current habitats - also active measures to support the surviving population. In selected forest stands, these should be primarily aimed at long-term improvement of the species' living conditions, the absence of which the capercaillie is very sensitive to. The management of the capercaillie habitat can therefore be integrated into regular forest management, by modifying or expanding commonly used forestry measures (BUČKO, ZIMA; 2023).



Figure 4: View into the primeval forest - the optimal habitat of the capercaillie (photo: Jozef Bučko)

The main goal of the training is to support active measures in forest management to improve the living conditions of the species. Participants will become familiar with basic theoretical knowledge in the field of species bionomy, current legislation, innovations and scientific research outputs. The presented examples of good practice from the domestic and foreign environment will confirm the acquired theoretical knowledge, the practical demonstration of procedures aimed at targeted improvement of the living conditions of the species will ensure the implementation of measures into the management of current operations.

Table 2: Content of the educational training - "Forestry management to support the capercaillie in forests"

Forestry management to support capercaillie in forests			
Total duration:		8 Hours	
Practical part:	4 hours	Theoretical part:	4 hours
Topics:	species bionomics, optimal environmental conditions		
	current legislation in the field of species protection and related management measures in forests		
	practical demonstration of active management of the species aimed at creating suitable living conditions for the species		
	visit to demonstration facilities, examples of good practice		

3.1.2 Damage to forest stands caused by game

The basic goal of forestry activity should be to manage forest lands in such a way that, taking into account existing natural risks, their ability to perform all forest functions is maintained or improved. Ecologically stable and vital forests can withstand both external and internal influences without seriously disrupting their functional structure. The biodiversity of forest ecosystems clearly includes common species of our ungulates. In the event of an imbalance in the state of game, for example due to its excessive concentration, it can act as a harmful factor (GUBKA et al., 2022). In order to enable objective and long-term recording of the impact of ungulates on forest stands, the NFC developed the "Methodology for Determining Damage to Forest Stands by Game and Valuing Damage" in 2020 (GUBKA et al., 2021).



Figure 5: Damage to forest trees caused by game (photo: Andrej Kunca)

As part of the educational trainings, participants will gain theoretical knowledge in the field of the state and development of the ungulate population in Slovakia, as well as the extent and distribution of damage caused by game. They will become familiar with the new methodology for detecting and valuing damage to forest stands by game, along with its possibilities for use in practice. Through field excursions, they will gain an overview of specific examples of damage caused by the imbalanced state of game populations in forest stands and ways to solve them in common operational practice.

Table 3: Content of the educational training - "Damage to forest stands caused by game"

Damage to forest stands caused by game			
Total duration:		8 Hours	
Practical part:	4 hours	Theoretical part:	4 hours
Topics:	status and development of ungulates in Slovakia and prognosis for the following periods		
	types of damage caused by animals in operational practice - visit to demonstration facilities		
	methodology for assessing forest damage and assessing damage		
	use of the methodology in operational practice		

3.1.2 Prevention, management of the introduction and spread of invasive and non-native species

The introduction of various species of organisms beyond their natural range, whether directly or indirectly by human intervention, can cause changes in the new ecosystem.

In some cases, these changes are very dramatic and can result in the extinction of native species or radical changes in the functioning of the ecosystem and biodiversity (GALKO et al., 2018).

Ongoing climate change and increasing globalization (increasing trade in goods and movement of people) contribute significantly to the increase in the number of accidental introductions (or. introductions) of new organisms. Rapid environmental changes cause previously non-native species of insects, fungi and plants to occupy new and new territories, where they find suitable conditions for life.

Educational activities will familiarize participants with the most important invasive and non-native species of insects, fungi and plants that have the greatest negative impact on native species and their habitats. Participants will also learn about the possibilities of using measures to prevent the introduction and spread of invasive non-native species.



Figure 6: Asian bearded dragonfly (*Anoplophora glabripennis* (Motschulsky, 1854) - adult (photo: Andrej Kunca)

Table 4: Content of the educational training - "Prevention, management of the introduction and spread of invasive and non-native species"

Prevention, management of the introduction and spread of invasive and non-native species	
Total duration:	8 Hours
Topics:	the most important invasive and non-native species in Slovakia
	current legislation in the field of invasive and non-native species
	innovations in measures to prevent the spread of invasive and non-native species
	possibilities of using measures to prevent the introduction and spread of invasive and non-native species in everyday practice

3.1.2 Sortimentation of wood

One of the most important functions of forest ecosystems is their production capacity. While forestry is unable to financially evaluate and implement other forest functions on the market, wood production and sale of wood assortments remain the most important source of financial resources for ensuring forest management.

Improving and deepening the knowledge of forest owners and managers in the field of optimizing the yield of raw wood assortments is an essential basis for maximizing revenues from the sale of wood mass.

In order to maximize the yield from the sale of wood mass, NFC has a unique device at its newly established research facility, the LignoSilva Centre of Excellence (CE) - a 3D CT scanning line of wood logs. Computed tomography technology allows you to create a three-dimensional model of a log and display its possible defects (GRACOVSKÝ, GERGEL; 2024).

Educational activities in the "Wood Sortimentation" category are intended to expand the professional knowledge and skills of professionals in the forestry sector in the field of assortment and handling of raw wood, the importance of proper assortment for the yield and monetization of wood.

Table 5: Content of the educational training - "Wood sortimentation"

Wood sortimentation			
Total duration:		8 Hours	
Practical part:	4 hours	Theoretical part:	4 hours
Topics:	logging, concentration and transportation of wood material with regard to wood sortimentation		
	measuring and marking wood, procedures for estimating the volume and weight of wood		
	operational and accounting records of wood, overview of deliveries and prices of raw wood		
	qualitative classification of assortments, wood characteristics and permitted deviations		
	proper handling (cutting) of wood, principles of storage and protection against deterioration		
	OHS principles in timber warehouses, during shipping and handling of timber		
	technological innovations in determining quality classes of assortments with a view to increasing the monetization of wood raw materials (3D CT scanner)		



Figure 7: 3D CT line and conveyor system (Source: Výstupy NLC pre lesnícku prax VI., 2024)

3.1.3 Forest fires

Forest fires cause significant damage to citizens' property every year, as well as to the environment itself, not to mention people's lives. Forest and grassland fires are most often recorded in the spring. Their occurrence is closely linked to the dry season, which occurs just after the snow melts. In our

conditions, however, one of the main causes of fires is human activity. By deliberately burning grasslands, or by starting a fire outside of designated areas, the fire often moves from the grassland to the forest. Based on these facts, forest fires in our conditions are currently considered primarily an anthropogenic harmful factor, less so a harmful factor of natural origin (MAJLINGOVÁ, 2015).

The topics included in the educational circle "Forest Fires" reflect the need to build a knowledge base for proper management of forests in terms of preventing the risk of fires. As part of the educational activities, participants will gain knowledge about forest fire protection, fire prevention, fire management, forest resilience in the context of climate change, and innovative methods for extinguishing fires. Field demonstrations of fire prevention measures will reinforce the theoretical knowledge acquired during the educational activities.

Table 6: Content of education educational training - "Forest fires"

Forest fires			
Total duration:		8 Hours	
Practical part:	2 hours	Theoretical part:	6 hours
Topics:	innovative methods used in firefighting		
	Resilience potential of forests in the context of climate change		
	protection of forests from fire and prevention of their occurrence		
	management measures for fighting fires		



Figure 9: Forest fire caused by an anthropogenic harmful agent (Photo: Bugalová Katarína)

3.1.3 Information systems in forestry (ISLH)

To ensure proper, correct and permanent management of forests, it is necessary to have data on their area, tree composition and their health status. It is also necessary to know the history of their development in order to be able to more accurately determine the trends in the development of individual

quantities in the future. In Slovakia, the basic source of this information is the Forest Management Plans with regular updates on a 10-year basis. Additional information is obtained through specialized surveys and forest monitoring, as well as forestry reports and statistics prepared on an annual basis (<https://gis.nlesk.org/islhp/#lesnictvo>). At the national level, the source of information on forests is the Forest Management Information System (ISLH), which is operated pursuant to Act No. 326/2005 Coll. on Forests. Based on Section 38, Paragraph 2, Letter e and Section 45 of this Act, the NFC is its administrator.

Educational activities aim to build awareness about the possibilities of using the Forest Management Information System for routine operations.

Table 7: Content of the educational training - "Forestry Information System" "

Forestry Information System (ISLH)			
Total duration:		4 Hours	
Practical part:	2 hours	Practical part:	2 hours
Topics:	ISLH - introduction, user interface presentation		
	working with ISLH - searching for information		
	working with ISLH - filling the database		
	practical possibilities of using ISLH in normal operation		

3.1.4 Modern technologies for increasing the efficiency of working with data in primary forestry production

When implementing appropriate forest management practices, it is necessary to take into account a significant amount of input data. Data acquisition and processing serves not only forest owners and managers, but also often follows from the law. To increase the efficiency of working with this data and reduce the error rate in their processing, it is currently possible to use modern software solutions for this purpose.

Educational activities are aimed at building awareness of the possibilities of effective use of modern technologies for the purposes of processing and further reporting of data.

Table 8: Content of the educational training - "Modern technologies for increasing the efficiency of working with data in forestry primary production"

Modern technologies for increasing the efficiency of working with data in forestry primary production			
Total duration:		8 Hours	
Practical part:	3 hours	Practical part:	5 hours
Topics:	introduction to the issues of data acquisition, processing and management using modern technologies		
	keeping forest evidence in accordance with applicable legislation using modern technologies		
	monitoring the movement of wood in the field and offices, use of modern technologies in operation		

	use of modern technologies in maintaining graphic evidence of forest stands
	use of modern technologies in timber harvesting with a link to the Harvesting Consent and forest evidence (LHE)

3.1.4 Communication skills and building soft skills

In addition to the further development of professional knowledge in the forestry sector, it is currently important to support the development of communication, language and other skills. These, together with technological knowledge and abilities, are key to applying them in practice and reflecting on changes in social demand for forests (KOSTILAINENA, 2005). By improving communication skills, we will contribute to better public awareness of forests, to understanding their importance for the quality of life and to building a positive opinion of the forestry profession. Proper communication will support the formation of environmental awareness and shared responsibility for the state of the environment. Soft skills will also help to perform routine operational tasks, and the removal of the language barrier will stimulate the emergence of new foreign partnerships and cooperation.



Figure 8: The process of building effective communication (Source: Vizslai Jr. - own adaptation)

Educational activities on topics from the above-mentioned area serve primarily to develop communication skills, they also offer the opportunity to improve other soft skills that can be effectively used in regular operational practice, as well as in communication with the general public. The division of topics into regular shorter sessions with a total duration of 10 hours offers participants a sufficient basis for use in the work process, and also provides the opportunity for further individual improvement in this area.

Table 9: Content of the educational training - Communication and building soft skills

Communication and building soft skills	
Total duration:	10 hours/topic
Length of 1 seminar within the topic	1-2 hours
Topics:	the importance of communication for building a positive image of forestry in the eyes of the general public, communication with the public
	basics of media communication
	communication with state administration bodies for the needs of forestry
	English for foresters, conversations in a foreign language
	time and project management
	managing conflict and stress situations in the workplace

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