



Mihi cura futuri  
**We take care  
of the future**



Faculty of Forestry and Wood Sciences  
Czech University of Life Science in Prague  
**Annual Report for the year 2017**



**Introduction**

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# 1 Introduction

The Annual Report on the Activities of the Faculty of Forestry and Wood Sciences (FFWS) of the Czech University of Life Sciences in Prague (CULS) was discussed by the FFWS Scientific Board on May 16, 2018 and approved by the FFWS Academic Senate on May 29, 2018.

The year 2017 can be characterised as another year dedicated to preparing prerequisites for building a modern institution capable of high-quality teaching, conducting excellent research, effectively cooperating with the sphere of practice, and providing necessary information to both the professional as well as general public. In 2017, much attention was paid to establishing good reputation of the Faculty and individual teams. Despite the declining number of available applicants, the total number of Faculty students reached two thousand, the highest number over the last five years. In the first half of 2017, there were campaigns aimed at enrolling 93–95% of B1, N1 and P1 students in comparison with 2016. The objective was achieved by enrolling 95% of students from 2016, which will secure per capita funding. Throughout 2017, we were intensively preparing for institutional accreditation (IA). In mid-year, a commission was set up to improve quality of teaching (Ing. Kašpar was appointed commission chairman) in direct connection with the IA, and a new staff member was hired for that purpose in autumn. Both of them have been intensively working on the preparation of materials for institutional accreditation since September 2017.

In the first half of the year, we were intensively working on the preparation of OP RDE projects in the call "Pre-application research", which, unfortunately, did not receive funding. On the other hand, in autumn 2017, we initiated work on the EVA4.0 project, and held a meeting with the proposed project and sub-project leaders. The EXTEMIT-K project, under which CZK 70 million were invested in 2017, set going. The project has been provided with a base in the new laboratory facilities covering the area of 300 m<sup>2</sup>, which have been equipped with state-of-the-art technology. New instruments and sets of equipment have been purchased for the project. New staff members and PhD students have been also recruited under this project. At the end of the year, the project staffing was nearly final (80%). The remaining jobs are filled by temporary staff (postdocs) who will be replaced by the postdocs from respective selection procedures in the coming period.

We were promoting excellence in publishing but have not achieved the required parameters yet. There is an insufficient number of high-quality teams with clearly defined visions and corresponding results at the Faculty. The dendrochronology team from the DFE or the termite research team from the DFPE can be named as examples of consistently well-established teams.

Some other departments (DGPFT, DGMWB, DFM, and DPW) are trying to systematically develop teams whereas in the remaining departments, the process of vision building is still under way (e.g. at DWPWC). Some departments lack a clear vision and though they have some partial publishing outputs, these are produced by a few individuals rather than as a result of pursuing long-term conceptual objectives.

In 2017, the FFWS headcount remained at approximately the same level; on the other hand, some offices have been converted into laboratories, which caused some spatial issues. In connection with recruitment of further employees into the EVA4.0 research project, we started preparing the project documentation for constructing an extension to the original faculty building. In line with that, we commenced preparing project documentation for the reconstruction of the original building planned for 2020–21. The demand for space has clearly increased as space is needed not only for employees' offices but also for storage of the rising number of instruments and materials for experiments. To that end, we plan to partially use the premises at the Truba research station but since 2017, we have also been negotiating about the possibility to use the CULS campus storage facilities.

With regard to the development plan for the FFWS Arboretum, we were preparing supporting documents for the transfer of 3 hectares of Arboretum area into the CULS' ownership throughout the entire year. We achieved this target at the end of the year and we can state that the entire Arboretum is currently located on the grounds of the CULS. The transfer of ownership of the land covering a total area of 5.5 hectares to the CULS also provided for an opportunity to further extend the area of the Arboretum by 5–7 hectares. Since autumn 2017, we have also been discussing the option of extending the Arboretum by inclusion of other areas. Much work will be needed in this area for which we would like to use additional funds from the OP.

Our financial performance for 2017 ended in surplus mainly thanks to the possibility to use resources from the EXTEMIT-K project and the helpfulness of the Rector's Office which saturated co-financing of the investment part of the project. The granted projects under the OP RDE have enabled the Faculty to rank among the top Czech universities in the area of laboratory equipment and instrumentation. The projects thus allow in an appropriate way for supplementing staff teams and doctoral students with high-quality scientists and technical staff to operate sophisticated instruments. The targeted financial policy towards optimal use of resources has enabled us to pay high-quality performance bonuses to employees several times a year. We continued in the trend of incrementing salaries mainly for those who can work well and hard. At present, the FFWS can thus be considered as a highly stable, intensively developing institution.

FFWS management



prof. Ing. Marek Turčáni, PhD., dean



Basic data

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## 2 FFWS basic data

### 2.1 Full name and address of the Faculty

#### **Full name**

Faculty of Forestry and Wood Sciences  
Czech University of Life Sciences Prague

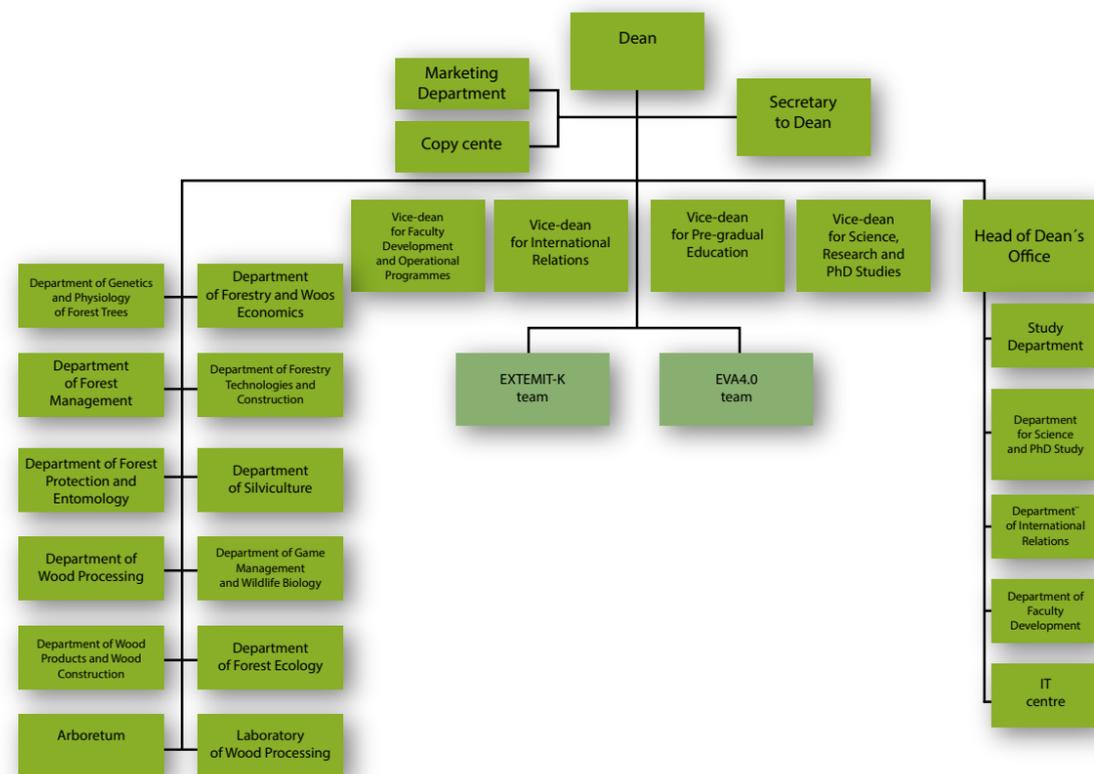
#### **Faculty address**

Czech University of Life Sciences in Prague  
Faculty of Forestry and Wood Sciences  
Kamycká 129  
165 00 Praha 6 – Suchbát

#### **Commonly used abbreviations**

FLD CZU (in Czech)  
FFWS (in Czech)  
FFWS CULS (in English)  
FFWS (in English)

## 2.2 Organisational chart and structure of the FFWS



## 2.3 Composition of the Advisory Board, Academic Senate and other FFWS bodies

### 2.3.1 Academic Senate

#### Academic staff:

doc. Ing. Oto Nakládal, Ph.D.  
 prof. Ing. Jaroslav Červený, CSc.  
 doc. Ing. Ivana Tomášková, Ph.D.  
 doc. Ing. Vítězslava Pešková, Ph.D.  
 Priv. Doz. Ing. Peter Surový, PhD.  
 doc. Ing. Milan Gaff, PhD.  
 doc. Ing. Vlastimil Hart, Ph.D.  
 Ing. Václav Bažant, Ph.D.

#### Students:

Ing. Radim Löwe  
 Ing. Monika Sedmíková  
 Ing. Lucie Hambálková  
 Ing. Jan Rohla

### 2.3.2 FFWS Advisory Board

#### Internal members – FFWS staff:

prof. Ing. Marek Turčáni, PhD., předseda  
 doc. Ing. Martin Böhm, Ph.D. (membership terminated as at 14 February 2017)  
 prof. Ing. Jaroslav Červený, CSc.  
 doc. Ing. Milan Gaff, PhD.  
 doc. Ing. Miroslav Hájek, Ph.D.  
 prof. Ing. Jaroslav Holuša, Ph.D.  
 doc. Ing. Václav Kupčák, CSc. (membership terminated as at 28 September 2017)  
 prof. Ing. Milan Lstibůrek, MSc., Ph.D.  
 prof. Ing. Róbert Marušák, PhD.  
 doc. Ing. Ján Merganič, PhD. (membership terminated as at 31 January 2017)  
 prof. Ing. Vilém Podrázský, CSc.

doc. Ing. Jiří Remeš, Ph.D.  
 prof. Ing. Miroslav Svoboda, Ph.D.  
 prof. Ing. Luděk Šišák, CSc.  
 doc. Ing. Ivana Tomášková, Ph.D.

**Internal members – remaining CULS faculties and departments:**

doc. Ing. Václav Hejnák, Ph.D.  
 doc. Ing. Milan Houška, Ph.D.  
 doc. Ing. Bohdan Lojka, Ph.D.  
 doc. Ing. Václav Malík, Ph.D.  
 doc. Ing. Jiří Mašek, Ph.D.  
 prof. Ing. Petr Sklenička, CSc.

**External members:**

Ing. Jiří Boháček  
 doc. Ing. Radomír Klvač, Ph.D.  
 doc. RNDr. Bohumír Lomský, CSc.  
 Prof. Dr. Ing. Viliam Pichler  
 Ing. Petr Pražan, Ph.D.  
 Prof. Ing. Mikuláš Siklienka, PhD. (membership terminated as at 28 September 2017)  
 doc. Ing. Alois Skoupý, CSc. (membership terminated as at 24 April 2017)  
 Ing. Jaromír Vašíček, CSc. (membership terminated as at 28 September 2017)  
 Ing. Daniel Vlkanova, Ph.D., MBA  
 Ing. Josef Vojáček  
 doc. Ing. Petr Zahradník, CSc.  
 Ing. Martin Žižka, Ph.D.

**Newly approved members in the FFWS Advisory Board:**

As of 31 January 2017, the following member was appointed:

Priv. Doz. Ing. Peter Surový, Ph.D.

As of 14 February 2017, the following member was appointed:

doc. Ing. Tomáš Kušta, Ph.D.

As of 25 April 2017, the following member was appointed:

Prof. RNDr. František Kačík, Ph.D.

As of 28 September 2017, the following member was appointed:

doc. Ing. Vítězslava Pešková, Ph.D.  
 Ing. Ľudmila Marušáková, Ph.D.  
 Prof. RNDr. Ing. Michal V. Marek, DrSc., dr. h. c.

**2.3.3 Management of the Faculty of Forestry and Wood Sciences**

**Dean:**

prof. Ing. Marek Turčáni, PhD.

**Vice-Deans:**

prof. Ing. Róbert Marušák, PhD., First Vice-Dean, Vice-Dean for International Relations

doc. Ing. Jiří Remeš, Ph.D., Vice-Dean for Education

doc. Ing. Tomáš Kušta, Ph.D., Vice-Dean for Research and Development

Ing. Radek Rinn, Vice-Dean for Development and Operational Programmes

**Head of the Dean's Office:**

Ing. Bc. Martin Prajer, Ph.D.



**Education activities**

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## 3 Education activities

The year 2017 represented an important milestone in the development of the entire higher education system in the Czech Republic. Changes associated with the new Higher Education Act have been fully implemented, preparation of applications for institutional accreditation commenced at a number of universities, the professional community started debating over education quality, evaluation, etc. Educational activities rank among the three fundamental roles of universities and it is therefore important to accentuate education quality assurance. The year 2017 represented a major step towards the next stage of the FFWS development. The MOST project (Modernisation of the Study Programmes and Studies, Quality and Counselling at CULS Prague) was launched in July 2017. One of the many project objectives is innovation of three existing branches of study (Forestry, Preservation of Natural Objects and Taxidermy, and Wood Engineering) and preparation of two new branches of study (System Arboristics, and Wooden Structures and Wood-based Constructions). Besides the above-mentioned Bachelor's and Master's study programmes, three new doctoral programmes are being prepared: Applied Geoinformatics and Long-distance Earth Exploration in Forestry, Global Change Forestry, and Forest, Wood and Wood-based Materials Fire Protection.

At the end of the summer of 2017, the commission for the evaluation of the quality of Bachelor's and diploma theses began operating. Its objective was to evaluate the current quality of theses and to de-



The year 2017 represented **a major step towards the next stage of the FFWS development.**

vised recommendations and rules for improvement of the current status. The quality of theses is one of the fundamental criteria how to evaluate the quality of educational activities at universities; therefore, the commission plays a crucial role.

The end of 2017 was significant as we commenced preparing applications for institutional accreditation of the Forestry and Wood Technology course. As part of the new procedures for accreditation, we also nominated evaluators for this educational area to serve in the National Accreditation Authority. We were able to provide relevant experts from the academic and scientific sector as well as from the sphere of practice and state administration. The number of FFWS evaluators was increased thanks to additional nominations in October 2017 to 17. The acquisition of institutional accreditation for Forestry and Wood Technology is of key importance for the future of educational activities at the FFWS and will be in the centre of our attention in 2018.

Besides the above-mentioned activities, other activities of equal importance were taking place in the area of educational activities based on the priorities and operational objectives defined in the Update of the Long-term Plan of the Faculty. These included namely support for gifted students by way of introducing new forms of scholarship for gifted students with excellent academic results. We also continued to issue new printed textbooks and electronic study materials. We also secured favourable conditions and environment for studies (modern premises, collection and teaching materials, state-of-the-art technologies).

In 2017, hard and intensive work on constant improvement of the quality of educational activities bore its fruit when the Faculty ranked second in the field of agricultural, forestry and veterinary sciences in a unique comparison of domestic universities conducted by the TÝDEN (WEEK) magazine. The Faculty achieved high score in this analysis particularly in the "Interest in School" and "External evaluation" categories. The latter category has reflected the inclusion of the Faculty in prestigious international rankings and evaluation by the National Accreditation Authority. The evaluation was published at the beginning of 2018.

### 3.1 Organisation of studies at the FFWS

The FFWS provides currently standard three-tier structured higher education, which is one of the main elements of the European Area of Higher Education (EHEA). The Faculty offers study programmes providing education in the field of forestry and wood sciences in their entirety, including issues related to public administration and business in this area or associated with game manage-

ment and other forest and landscape components, including management of forests in protected landscape areas – both in Czech and English languages. In accordance with the Classification of Educational Programme Types (KKOV), the Faculty renders branches in the field of technical sciences, agro-forestry and veterinary sciences and economics. Studies at the FFWS are governed by applicable legislative and internal regulations of the CULS. No study programmes at the FFWS are rendered in collaboration with another university or tertiary institution.

### 3.1.1 Accredited study programmes and branches of study at the Bachelor's, follow-up Master's and postgraduate levels of degree taught in the Czech language

In 2017, the FFWS was providing 6 Bachelor's study branches taught in Czech (Forestry, Wood Technology, Economic Administration Services in Forestry, Business in the Wood Processing and Furniture Industry, Operation and Game Management, Preservation of Natural Objects and Taxidermy). In 2017, within the framework of follow-up studies, it was also possible to study 2 Master's branches of study taught in Czech: Forest Engineering, and Wood Engineering. Upon fulfilment of admission procedure conditions, applicants were admitted to all the above-mentioned Bachelor's and Master's branches of study for the academic year 2017/18.

The doctoral studies were pursued in seven branches: Forest Biology, Forest Management, Silviculture (3 years), Silviculture (4 years), Forest Protection and Game Management (3 years), Forest Protection and Game Management (4 years), Wood Processing and Forest Machinery, and Economics and Management of an Enterprise. All branches are accredited for full-time and combined types of study. In 2017, we held admission procedure for the DSP for the academic year 2017/18 in the framework of the general conditions for the branches of Forest Biology, Forest Protection and Game Management, Silviculture, Wood Processing and Machinery in Forest Management, and Economics and Management of an Enterprise for the standard period of study for 4 years, and for the Forest Management for 3 years.

### 3.1.2 Accredited study programmes and branches of study at the Bachelor's, follow-up Master's and postgraduate levels of degree taught in the English language

In 2017, it was possible to study 3 Bachelor's branches of study taught in English (Forestry, Wood Technology, and Game management) and 4 Master's branches of study taught in English (Forest Engineering, Wood Engineering, Forestry, Water and Landscape Management, and Tropical Forestry and Agroforestry). The Forestry, Water and Landscape Management branch was taught in collaboration with the Faculty of Environmental Sciences and the Tropical Forestry and Agroforestry branch was taught in collaboration with the Faculty of Tropical AgriSciences as in previous years.

### 3.1.3 Double Degree Programmes

For a long time, the double degree (DD) programmes have been a stable part of the offer of studies at the FFWS. Currently, three contracts have been concluded for the implementation of DD programmes. Two of them have been signed with the Faculty of Forestry (Escuela Técnica Superior de Ingenieros de Montes) of the Technical University of Madrid (for the Forestry, Water and Landscape Management, and the Forest Engineering branches of study) and one with the Volga State University in Russia (Wood Engineering).

Four Spanish students from the Madrid University were successfully studying under the DD programme in 2017. They passed all the prescribed examinations by the end of the year and were preparing their theses. State final examinations were held on 27 February 2018.

### 3.1.4 Educational activities outside the accredited study programmes

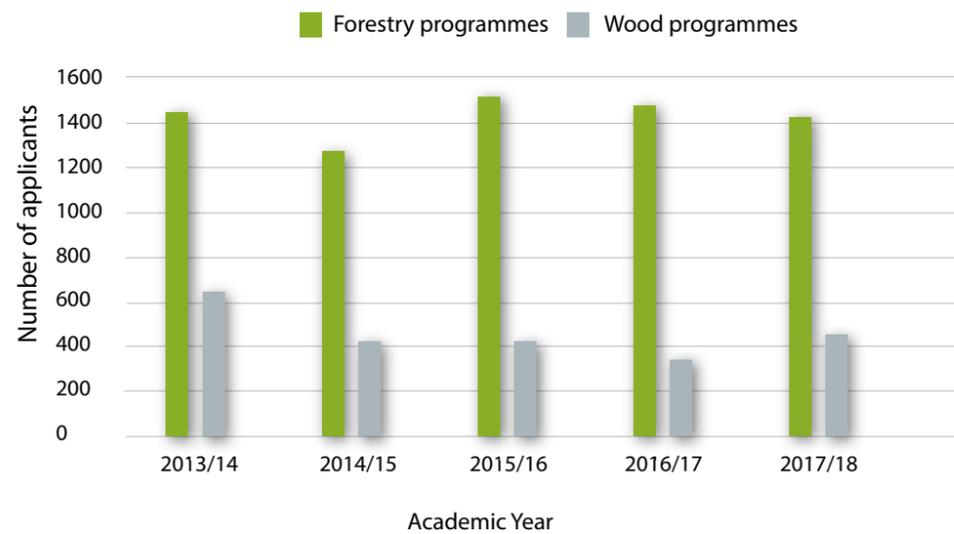
Educational activities outside the accredited study programmes are related to the activities of FFWS student associations which, with the support of the FFWS, hold a number of lectures, interesting film projections with subsequent discussions and other events (e.g. lectures about African swine fever or basic processing of hunted game). In 2017, we organised an event initiated by the Wood for Life Foundation titled "Career with the Scent of Wood" designed for students of the study branch of wood sciences.

In addition, in 2017, the FFWS offered to students and educators lectures of both domestic and foreign lecturers. The Life Sciences Film Festival, including also discussions about the selected film projections, was also a traditional component of educational activities. In 2017, the discussions focused on communication between the professional and lay public.

### 3.2 Interest in studies at the FFWS

In total, 1,887 applications were submitted to all the Bachelor’s and Master’s branches of study at the FFWS in 2017. Despite the negative trends in the demographic curve in the Czech Republic, we succeed to keep a stable number of applications every year thanks to an active and positively perceived presentation of the Faculty (Fig. 1, Chart 1).

**Fig. 1:** Development of the number of applications for studies at the FFWS over the past 5 years



**Chart 1:** Development of the number of applications for studies in individual branches of study at the FFWS over the past 5 years

Field of Study	2013/14	2014/15	2015/16	2016/17	2017/18
Forestry (full-time, part-time)	536	465	517	739	622
Economic Administration Services in Forestry (full-time, part-time)	483	281	224	129	278
Operation and Game Management (full-time, part-time)	231	265	348	213	208
Wood Technology (full-time, part-time)	222	167	182	139	245
Business in the Wood Processing and Furniture Industry	246	177	176	141	134
Preservation of Natural Objects and Taxidermy	0	25	60	29	24
Forestry (taught in English)	7	18	45	35	41
Game Management (taught in English)	1	1	9	15	0
Forest Engineering (full-time, part-time)	187	203	293	231	190
Wood Engineering (full-time, part-time)	171	88	60	64	75

Forestry, Water and Landscape Management (taught in English)	11	15	17	47	39
Forest Engineering (taught in English)	0	0	2	23	0
Tropical Forestry and Agroforestry (taught in English)	0	1	5	25	31
<b>Total</b>	<b>2095</b>	<b>1706</b>	<b>1938</b>	<b>1830</b>	<b>1887</b>

Although the birth rate in the Czech Republic has been slightly rising over the past two years and the demographic curve will be gradually growing in the coming years, it will be reflected positively on the number of students no sooner than after some 15–20 years. In the period of demographic decline, one of the options how to complement the number of potentially missing students are applicants from abroad; this strategy has been successful to some extent. In 2017, the proportion of foreigners in submitted applications amounted to 18.34%. Most of the foreign applicants, however, never enrol in the university due to the problems associated with obtaining of visas. An ample offer of high-quality branches of study/study programmes together with an active campaign aimed at recruiting quality students remain the chief priorities for the educational activities at the FFWS in 2018.

#### 3.2.1 Student recruitment

The Faculty of Forestry and Wood Sciences has a strategy of active addressing of prospective students through both direct and indirect (Internet) campaigns. These campaigns have been developed by the FFWS Marketing Department, which is also fully in charge of them. The direct campaign is focused on presenting the studies at the FFWS at selected secondary schools. Students from selected secondary schools are also invited to Open Days (in autumn, winter and spring terms), which remained an important part of providing prospective applicants with information in 2017. In 2017, the Open Days were attended by approx. 330 visitors out of which 283 were applicants for study.

In 2017, an attention in promoting studies at the FFWS was also paid to some schools abroad (Slovak Republic), including personal visits to selected secondary schools of forestry (Prešov, Liptovský Hrádok). The FFWS was also active at some study and career fairs in the Slovak Republic (Academy & VAPAC Bratislava, Gaudeamus Nitra).

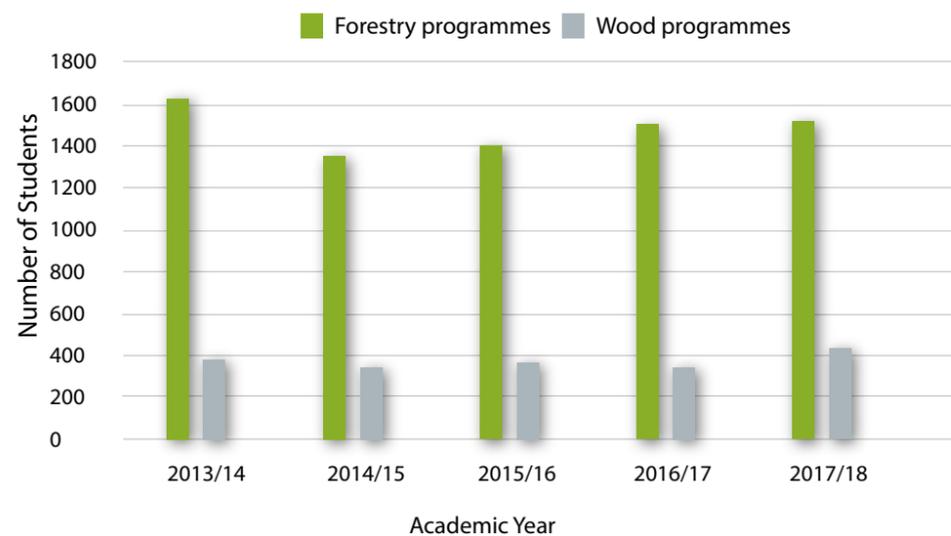
Besides these recruitment efforts, the cooperation with secondary schools in the area of educational and secondary specialised activities is of importance for the FFWS promotion. In 2017, it took the form of holding the YPEF international competition (Young People in European Forests), where the FFWS takes part in the organisation with selected secondary

forestry schools (in Písek, Hranice na Moravě, Žlutice and Trutnov) and Czech Forestry Society. In 2017, the FFWS again organised the regional round of this competition for Prague and the national round as well.

### 3.3 Students at FFWS

According to the new guidance of the Ministry of Education, Youth and Sports, universities report the number of studies, not the number of students (one natural person can be enrolled in several studies) starting from 2017. Only active studies as at 31 December 2017 are included. In 2017, there were 1,997 studies in all the branches of study at the FFWS. Out of that number 679 were women (34%) and 189 foreigners (9%). In total, 1,408 Bachelor's studies, 425 Master's studies, and 164 doctoral studies were conducted.

**Fig. 2:** Development of the real number of students at the FFWS over the past 5 academic years



In the academic year, the forestry branches of study underwent a considerable drop in the number of students; nevertheless, since then, the number of students as well as the number of applications have risen successfully and have remained at a stable level (Fig. 2). The number of students of the study branch of wood sciences has also been stable and balanced in the long term.

### 3.3.1 Students in accredited branches of study at the FFWS

Real numbers of students in individual Bachelor's and Master's branches of study at the FFWS over the past 5 years are specified in Chart 2. It is obvious that the proportion of students of the study branch of wood sciences at the Bachelor's degree level is well balanced and stable in the long term and is not subject to such variations as the number of students in the forestry branches of study. The slight increase in the number of students of the study branches of wood sciences in recent years is related to the gradual commencement of the course "Business in the Wood Processing and Furniture Industry". The number of students in the forestry branches of study has been slightly increasing over the last 3 years.

In the follow-up Master's degree studies, there has been a greater volatility in the number of students over the past 5 years. In 2014, a rather significant decline in the number of students was recorded. In 2015, the decline was compensated and in 2016, the figure was boosted nearly up to the level of the years 2012 and 2013. The upward trend may be attributed to an increase in the number of students in the forestry branches of study. As regards Forest Engineering, the number of students slightly increased in 2016. Such an increase was also maintained in 2017.

**Chart 2:** Development in the number of students in accredited Bachelor's and Master's branches of study at the FFWS over the past 5 years

Field of Study	2013/14	2014/15	2015/16	2016/17	2017/18
Forestry (full-time, part-time)	435	431	477	565	582
Economic Administration Services in Forestry (full-time, part-time)	520	318	196	149	219
Operation and Game Management (full-time, part-time)	306	283	326	341	324
Wood Technology (full-time, part-time)	180	141	158	119	195
Business in the Wood Processing and Furniture Industry	42	73	117	130	130
Preservation of Natural Objects and Taxidermy	0	9	34	35	33
Forestry (taught in English)	3	7	13	9	14
Game Management (taught in English)	0	0	0	0	0
Forest Engineering (full-time, part-time)	348	293	355	393	331
Wood Engineering (full-time, part-time)	168	135	89	93	109
Forestry, Water and Landscape Management (taught in English)	19	13	5	9	14
Forest Engineering (taught in English)	0	0	0	1	5
Wood Engineering (taught in English)	0	0	0	0	0
Tropical Forestry and Agroforestry (taught in English)	0	0	1	4	3
<b>Total</b>	<b>2021</b>	<b>1703</b>	<b>1771</b>	<b>1848</b>	<b>1959</b>

**Fig. 3:** Development in the number of Bachelor students in various forms of studies



**Fig. 4:** Development in the number of Master students in various forms of studies

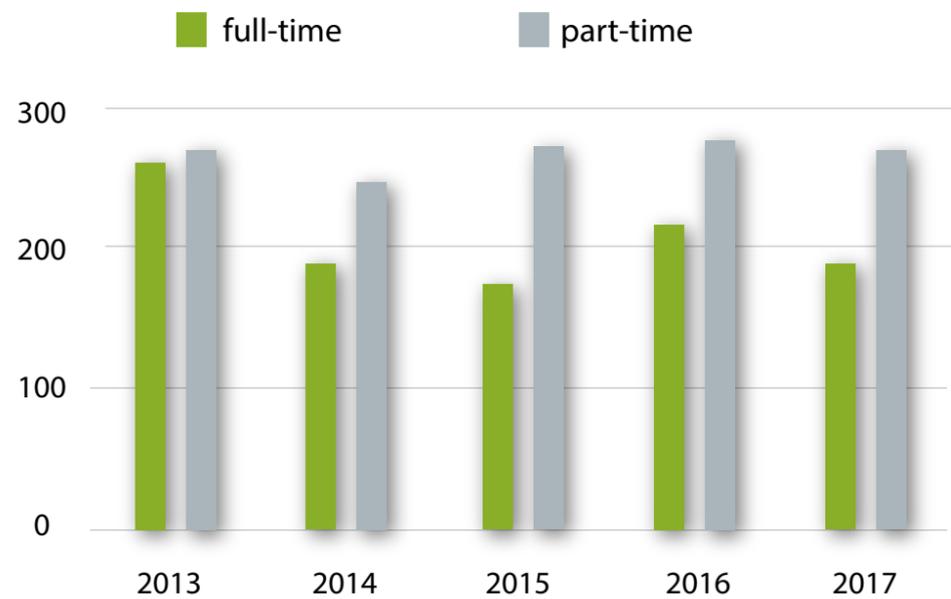
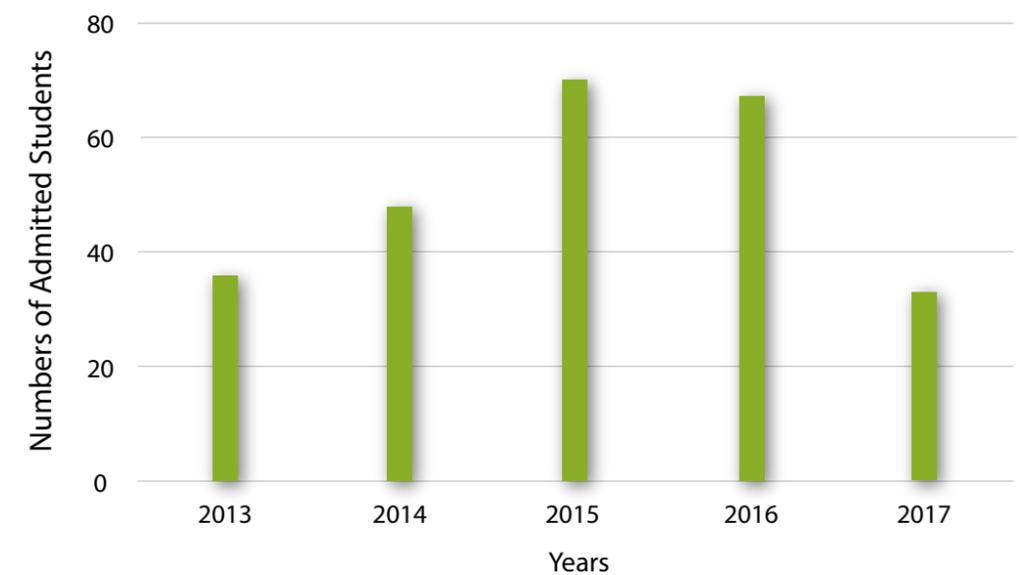


Fig. 3 and 4 list the proportions between the students of the full-time or combined form of study in the last 7 years. It is obvious that the shares and the development of the ratio between the number of students in the full-time and combined form of study differ. In 2017,

the number of students both in the full-time and combined form of study in Bachelor's branches of study was rising while the number of students in both forms of study in follow-up Master's branches of study was declining. A relatively high proportion of students in the combined form of study is indicative of the attractiveness of FFWS branches of study as means of supplementing qualification of already employed people. Another reason is the offer of jobs for full-time students especially at the Master's level, which in many cases motivates students to change the form of study. The result of these facts is a situation where all our graduates become employed shortly after graduating.

In 2017, 164 PhD students studied at the FFWS out of which 130 students were full-time and 34 students attended a combined form of study. Thirty-three new students were admitted for all the doctoral branches of study and forms of study. The numbers of admitted DSP students in the first year split according to the form of study and individual branches of study over the last 5 years are shown in Fig. 5. In comparison with previous years, the number of students went down considerably. It is due to increased demands on new PhD students. As regards the R&D development strategy at the FFWS, a continued greater emphasis shall be put on quality and outcomes of doctoral students' studies. The publishing activity of PhD students of the combined form of study is still low, their involvement in site projects is minimal and a large number of these students interrupt their studies and eventually often drop out their studies. The lower number of admitted students in 2017 was partially attributable to the fact that some applicants came from foreign countries where obtaining of visas is not easy.

**Fig. 5:** The numbers of admitted DSP students at the FFWS over the last 5 years



### 3.3.2 Students' study results

Enhancement of students' success rate is a long-term process involving several key strategic steps. One of them is increasing students' motivation. The chief tools that are used to enhance the study motivation at the FFWS include: scholarship programmes, the development of active and talented students, which is supported also through extracurricular activities, the promotion of cooperation with the sphere of application increasing graduates' employability and thus making learning more attractive.

In 2017, the system of support of students was extended. In the course of 2017, the amount of university merit scholarship was increased noticeably. The "Young Scientist" scholarship programme designed for Bachelor's degree students and Master's degree students from the 2nd and 3rd years is gaining popularity. Its capacity was in 2017 expanded to include 44 students. Another type of scholarship which the students can be granted is a sports scholarship or a scholarship for gifted Bachelor's degree full-time freshmen. The scholarship is awarded in accordance with the Directive of the CULS Rector or it is a one-time scholarship based on the school-leaving exam results and meeting of other conditions.

Since 2017, the student dropout rate has been reflected newly in the guideline for the distribution of the budget among universities (the Graduation Rate parameter). This parameter is calculated on the basis of the proportion of the number of graduates who successfully graduate after the standard period of studies increased by a maximum of one year to the overall number of students enrolled in university in the specified decisive period. Nevertheless, students not studying longer than 455 days are not included in the calculation. As a result, the dropout rate in the first year does not reduce this parameter. It will logically be reflected in the strategy at the FFWS where first-year students will be allowed to advance to the summer semester only after they have met the defined study obligations in full compliance with the Study and Exam Code.

### 3.3.3 Students in the courses of lifelong learning programmes

In 2017, as part of lifelong learning, the Forest Management and Protection of Nature course was held at the FFWS University of the Third Age. The course started in autumn 2016 and will end in spring 2018. The course is attended by more than 80 students who evaluate it highly positively. Demonstrated interest in another course of the University of the Third Age, planned to be launched in 2018, is also a mark of positive evaluation.

In 2017, the FFWS also hosted a course for the Forest Management Institute employees focused on the issue of wood processing regulations.

## 3.4 FFWS graduates

In 2017, 302 students successfully graduated from all the degree programmes and forms of study at the CULS FFWS in Prague. Most of them graduated in the group of agricultural, forestry and veterinary sciences – 254 students. More than one third of graduates were women (36%). The number of graduates per individual branches of study is given in Chart 3. Unlike the number of students, the number of graduates is not subject to such fluctuations and remains stable in the long term. In recent years, it has been growing slightly; nevertheless, in 2017, compared to the year 2016, the number of graduates in Bachelor's and Master's degree branches of study slightly decreased while the number of graduates with both Bachelor's and Master's degree dropped.

**Chart 3:** Numbers of graduates in individual Bachelor's and Master's branches of study at the FFWS in the academic year 2017/18

Field of Study	2017/18
Forestry (full time, part-time)	48
Economic Administration Services in Forestry (full-time, part-time)	41
Operation and Game Management (full-time, part-time)	32
Wood Technology (full-time, part-time)	8
Business in the Wood Processing and Furniture Industry	17
Preservation of Natural Objects and Taxidermy	2
Forestry (Taught in English)	1
Game Management (Taught in English)	0
Forest Engineering (full-time, part-time)	119
Wood Engineering (full-time, part-time)	22
Forest, Water and Landscape Management	2
Forest Engineering (Taught in English)	0
Wood Engineering (Taught in English)	0
Tropical Forestry and Agroforestry (Taught in English)	0
<b>Total</b>	<b>292</b>

Very low numbers of graduates at the Bachelor's degree level have been seen for long term in the Wood Technology branch of study, which is related to the demanding nature of the studies. Neither other branches of study have high numbers of graduates, especially if compared with the number of students who begin studying.

The balanced and reasonably high numbers of graduates of the Master's degree study programme (in particular, in the case of full-time studies where the number of graduates in the Forest Engineering ranges between 30 and 60 and in the case of the Wood Engineering between 16 and 24) contribute to their very low unemployment and good employability.

Overall, in the academic year, 292 students of Bachelor's and Master's branches of study successfully graduated from the FFWS, and 9 students of doctoral study programmes successfully completed studies by defending their dissertations.

### 3.4.1 Employability of graduates

The FFWS monitors and evaluates the unemployment rates of its graduates on a regular basis. According to available data provided by labour offices and the Ministry of Labour and Social Affairs, only one unemployed graduate from the FFWS was registered at a labour office in 2017 (Chart 4). The above comparison makes it clear that unemployment of graduates between 2016 and 2017 even considerably decreased and remains at a minimum level (while being markedly below average when compared to related branches of study in the Czech Republic). The demand for FFWS students in practice is obvious also from the fact that many students switch to a combined form of study during their Master's studies because of finding a job

**Chart 4:** Graduates registered by labour offices of the Czech Republic by universities and branches of study as at 30 September 2017 (Source: Ministry of Labour and Social Affairs)

Bachelor's study programmes		2016					2017				
Field of Study	Number of unemployed	Standard number	Graduate full-time	Graduate part-time	Unemployment rate	Number of unemployed	Standard number	Graduate full-time	Graduate part-time	unemployment rate	
B 33 41 Wood Technology	0	0,0	12	0	0%	0	0,0	22	1	0%	
3341R001 Wood Technology	0	0,0	12	0	0%	0	0,0	7	1	0%	
3341R004 Business in the Wood Processing and Furniture Industry	0	0,0	0	0	x	0	0,0	15	0	0%	
B 41 32 Forestry	1	1,1	99	82	0,6%	1	0,9	65	53	0,8%	
4132R002 Forestry	1	1,1	41	13	2,1%	1	0,9	34	14	2,0%	
4132R002 Forestry (Taught in English)	0	0,0	0	0	x	0	0,0	1	0	0%	

8242R001 Preservation of Natural Objects and Taxidermy	0	0,0	0	0	x	0	0,0	2	0	0%
4132R001 Economic Administration Services in Forestry	0	0,0	47	29	0%	0	0,0	19	19	0%
4132R004 Operation and Game Management	0	0,0	11	40	0%	0	0,0	12	20	0%
<b>Total</b>	<b>1</b>	<b>1,1</b>	<b>111</b>	<b>82</b>	<b>0,6%</b>	<b>1</b>	<b>0,9</b>	<b>87</b>	<b>54</b>	<b>0,7%</b>

Master's degree programmes		2016					2017				
Filed of Study	Number of unemployed	standard number	Graduate full-time	Graduate part-time	unemployment rate	Number of unemployed	standard number	Graduate full-time	Graduate part-time	unemployment rate	
N 33 01 Wood Technology	1	1,0	13	8	4,7%	0	0,0	15	7	0%	
3301T001 Wood Technology	1	1,0	13	8	4,7%	0	0,0	15	7	0%	
N 41 07 Forest Engineering	3	4,6	38	63	5%	0	0,0	59	59	0%	
4107T014 Forestry, Water and Landscape Management (Taught in English)	0	0	2	0	0%	0	0,0	1	0	0%	
4107T003 Forest Engineering	3	4,6	36	63	5%	0	0,0	58	59	0%	
<b>Total</b>	<b>4</b>	<b>5,6</b>	<b>51</b>	<b>71</b>	<b>4,6%</b>	<b>0</b>	<b>0,0</b>	<b>74</b>	<b>66</b>	<b>0%</b>	

In order to enhance employability of graduates, the CULS holds events focusing on career consulting or events directly aimed at job acquisition. The Job Fair may serve as one of the examples of opportunities for students to establish contacts with potential employers. In 2017, there were eight exhibitors on behalf of the FFWS: BJS Czech, s. r. o., KAISER, s. r. o., KRONOSPAN CR, s. r. o., Lesprojekt východní Čechy, s. r. o., Lesy České republiky, s. p., Forest Management Institute in Brandýs nad Labem, MATRIX, a. s., a PROGLES, s. r. o. The companies presented their offers of jobs and other opportunities for cooperation to future FFWS graduates. Throughout the day, the presentation stands in the Pavilion of Wood Sciences were frequently visited by students and teachers from the whole of the CULS. The attendance has been estimated at 1,500–2,000 persons. According to the information from FFWS exhibitors, students from other faculties were interested in the activity of the above companies as well.

### 3.5 Cooperation with the application sphere

Cooperation with the sphere of application has been taking place at the FFWS on a long-term basis. Well evaluated cooperation mainly with Vojenské lesy a statky, s.p., Matrix, a.s., Městské lesy Doksy, s.r.o. and others continued in 2017. Cooperation with future employers of FFWS graduates takes place primarily in the area of education, chiefly in implementation of practical training and in the solution of students' diploma theses. Cooperation is also executed when organising extracurricular activities (specialised seminars,

activities under the Forest Pedagogy, etc.). In 2017, cooperation was developing well also with Lesy České republiky, s.p., as a contract was again signed and then performed, allowing for extension of the publishing activities of the FFWS in the field of teaching materials. In 2017, we started discussing with LČR s.p. their declared need for graduates' deeper technical knowledge. LČR has been offered a lifelong learning course in this debate.

### 3.5.1 Council for Cooperation with Practice

Undoubtedly, the Council for Cooperation with Practice, which includes representatives of major employers in the given sectors, is an important form of cooperation with representatives of potential future employers of FFWS graduates. The Council acts as a link between the academic and educational life of the Faculty and real-life practice and comments mainly on the curricula with respect to the employability of graduates on the



In order to enhance employability of graduates, the CULS holds events focusing on **career consulting or events directly aimed at job acquisition.**

labour market, practical training of students, lifelong learning programmes and cooperation in science and research. It therefore provides a feedback necessary to improve the quality of studies at the FFWS, but also presents new ideas and possibilities for scientific and expert cooperation. Applying science and research results into practice is an important and integral part of all activities of the Faculty. In 2017, through the Council for Cooperation with Practice a debate has been launched on the theme of the needs and requirements of the practice in the field of standard and lifelong learning with a perspective of longer term employment. At the first stage of this debate, the Council distributed a questionnaire to employers in order to identify the strengths and weaknesses of graduates and to have a better overview of the positions they occupy. Cooperation in defining the needs and requirements of the practice has been incorporated into the innovation of branches of study under the MOST project (Modernisation of the Study Programmes and Studies, Quality and Counselling at CULS Prague).

### 3.5.2 Cooperation in education

In 2017, experts from practice were involved in educational activities mainly as members of state final examination and state doctoral examination committees. As it has been a regular collaboration for majority of them, they provide the CULS FFWS management with highly valuable feedback regarding the year-on-year independent evaluation of the quality of theses and/or graduates. This feedback is then projected to educational activities at the FFWS.

Some experts from the sphere of application are also directly involved in the educational process through external teaching; in 2017, there were 14 of them at the FFWS. The sphere of application is directly involved in the implementation of programmes of study in the form of consultations of Bachelor's and diploma theses, and especially the performance of individual practical training sessions and other vocational education (field trips and excursions).

Because of the focus of educational activities at the FFWS, professional practice plays a vital role in studies. In 2017, individual practical sessions with 117 external partners participating were conducted. Currently, there are four branches of study at the FFWS whose curricula include a mandatory practice lasting at least one month. In 2017, total of 380 FFWS students took part in these practical training sessions.

### 3.6 Summary

In the academic year 2017/18, the FFWS was also offering attractive branches of study in the entire spectrum of forestry-timber sector. The stable number of students in the branches of study bears witness to the attractiveness of studies at the FFWS despite the nationwide issues related to the demographic composition of the population.

The year 2018 will be crucial for the FFWS due to legislative changes. Most of the branches of study will have to be accredited again for the next period in 2018. Numerous current branches of study will be innovated. In the coming years, much attention will be focused on assurance and subsequent evaluation of the quality of educational activities. In 2017, the FFWS continued with other necessary steps towards further quality enhancement in compliance with its Long-term Plan for 2016–2020.

Science and research

4

## 4 Science and research

The main activities of the Faculty in S&R are strategically aimed especially at intensive promotion of quality and excellence, which are of top priority in line with the Update of the Long-term Plan of the Faculty. In 2017, these activities focused primarily on publishing in excellent journals with an impact factor (IF), support and development of young scientists and scientific teams, development of international cooperation in the field of research and development, fund-raising for creative activities from project resources, and enhancing the quality of doctoral studies. In 2017, much attention was directed towards the execution of projects that are strategically targeted at building excellence at the FFWS (EXTEMIT-K and the launch of the EVA 4.0 project) fully in line with the strategy of the FFWS and the Czech Republic in the area of improving the quality of science and research.

All the below presented graphic development data and facts confirm that the Faculty keeps pursuing a positive trend both in increasing the publishing activities of the entire Faculty and, in particular, in raising the quality of publishing outputs where many of them are excellent. The Faculty is thus on the right track in the process of building an excellent scientific and research centre.

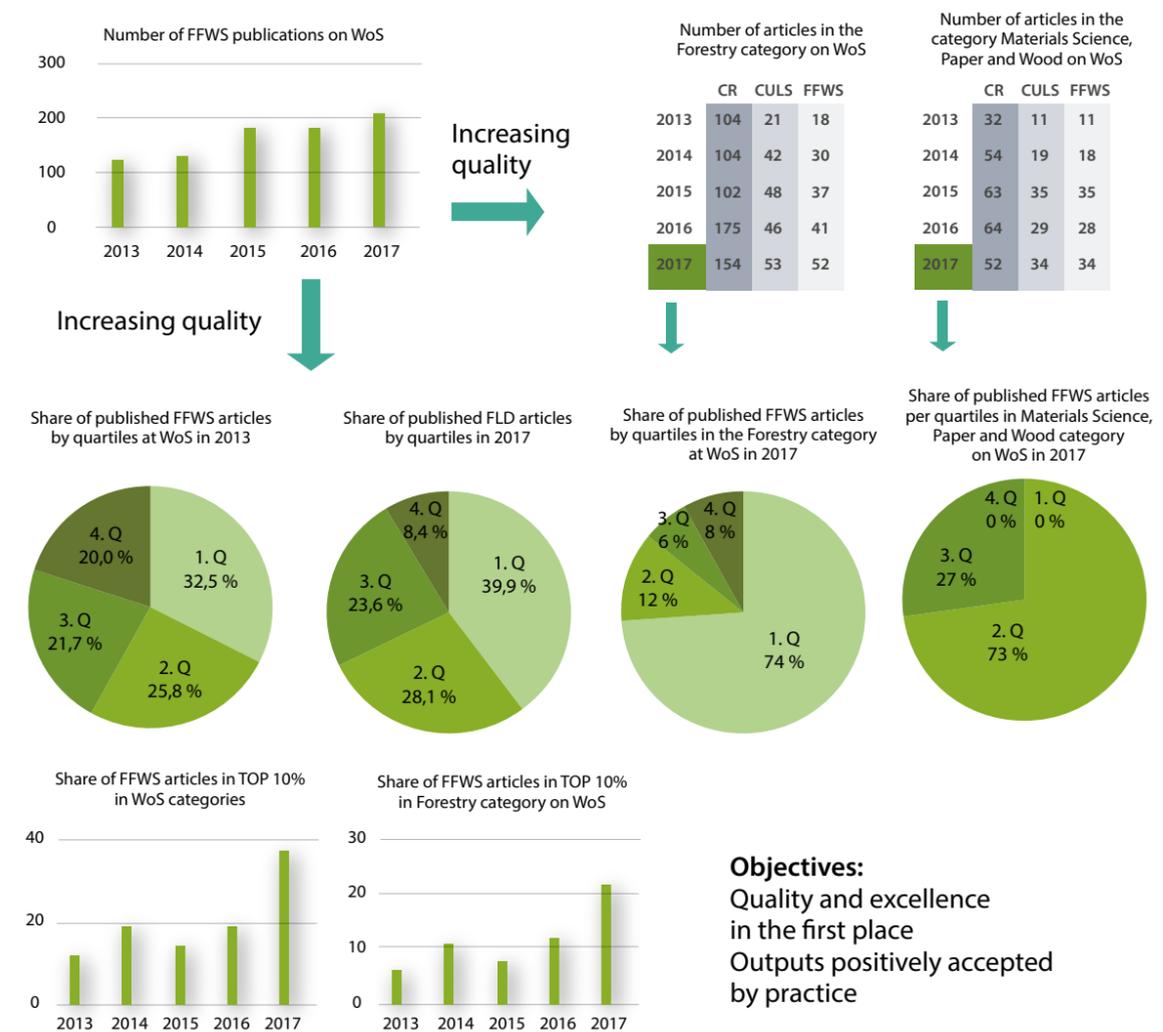
### 4.1 Publishing activities and S&R results

Publication outputs serve as one of quantitative and qualitative S&R evaluation standards. Greater emphasis placed mainly on increasing the quality of scientific outputs published in excellent IF journals and adopting incentive measures has been already reflected on the quality of publishing outputs at the FFWS (in spite of the ever growing number of outputs) at several levels: a) rising percentage of articles in the first and second quartile in the best top 10% in individual categories on the WoS; b) increasing proportion of articles in the national number and the quality of articles published in the Forestry, and Materials Science, Paper and Wood categories on the WoS, which are principal categories given the Faculty's focus. The fact that these measures are correct is obvious from Fig. 6. The trend in the number of various types of articles since 2011 is clearly evident from this figure. It is obvious that in 2017, the FFWS staff published 201 scientific articles in IF journals, which is the highest number in the history of the Faculty. S&R performance of the FFWS has been increasing every year. It is evidenced by the fact that, e.g., the FFWS gained 15,680 RIV points in the 2014 RIV evaluation whereas in the 2016 RIV evaluation, it was already 20,816 RIV points. With this

result, the FFWS is the best faculty at the CULS.

Nevertheless, it is essential for the Faculty that the quality of outputs published on the WoS has been increasing, which is also clearly confirmed by Chart 6. Due to the general upward trend of rising quantity and quality of publications in journals of the highest quality, it is increasingly difficult to win recognition in these journals. We thus find it even more encouraging that 39.9% of published IF articles appeared in journals in the first quartile of the given WoS sector while in multidisciplinary journals their average quartile is lower than 1.5. Overall, more than 68% of articles were published in the top two quartiles of WoS journals in 2017. We can consider it an excellent result. It is thus obvious that there has been a gradual boost of publishing activities of the Faculty employees even in the top IF journals.

**Fig. 6:** Results of creative activity at the FFWS from 2013 to 2017

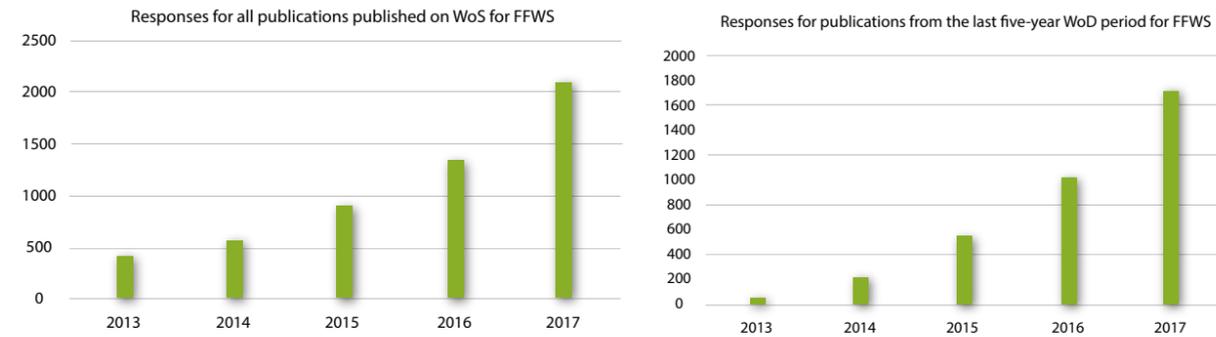


The rising quality of scientific outputs has been evidenced also by the broader range of journals in TOP 10% according to IF on the WoS from 2 journals in 2013 to 7 journals in 2017. The high quality of the Faculty's outputs is highlighted by the fact that 5 articles were published in the best journal in the Forestry category over the last two years. Nonetheless, the range of journals where the FFWS publishes its articles has been broadening considerably. In 2013, the FFWS staff published articles in 65 IF journals with, in 2017, already in 104 various IF journals, most often in BioResources, Zootaxa, Forest Ecology and Management, and Wood Research. The most common branches according to the 17+ guidelines (Frascati Manual) where the outputs of scientific work of the Faculty staff were published included Forestry, Entomology, Paper and Wood, and Zoology. Within Scopus journals, most articles were published in the second quartile. The Scopus articles, which totalled 36 in 2017, were most often published in the Journal of Forest Science, Central European Forestry Journal, and Zprávy lesnického výzkumu (Reports of Forestry Research). These were mainly publications in the field of forestry. Mostly PhD students (and their tutors), mainly from the Department of Silviculture and the Department of Forestry and Wood Economics, publish in Scopus journals. In accordance with the FFWS strategy, we succeed to maintain the trend of a low number of publications in peer-reviewed journals. In order to maintain relationship with the practice needed for the participation in project proposals, the Faculty staff members published their works in a limited amount in conference and seminar proceedings and in journals for professionals. In the area of non-publication outcomes, we created outputs resulting from the obligations under the projects in implementation. These are 13 certified methodologies, 12 maps with professional content, 3 scientific monographs, 2 patents, 4 utility models and industrial designs, and 7 prototypes and functional samples. In most cases these were the application outputs of current projects of the National Agency for Agricultural Research (NAZV) or the Technology Agency of the Czech Republic (TA CR) and contractual research. As regards such outputs, we gradually broaden our cooperation with foreign institutions. In 2013, we prepared joint outputs in collaboration with 68 foreign institutions whereas in 2017, it was with 85 ones. It is mostly collaboration with excellent foreign partners (e.g. University of British Columbia, University of Bodenkultur Wien, University of Duisburg Essen, Technische Universität München – Freising, Wageningen University, University of Georgia, and many others).

The significance of our creative activity is documented by citation feedback in the WoS database where the FFWS is doing very well – both as regards publications over the last

5 years and all the publications posted on the WoS by the FFWS (see Fig. 7 – data as at 28 February 2018).

**Fig. 7:** Feedback for publications of FFWS authors published on the WoS between 2013 and 2017

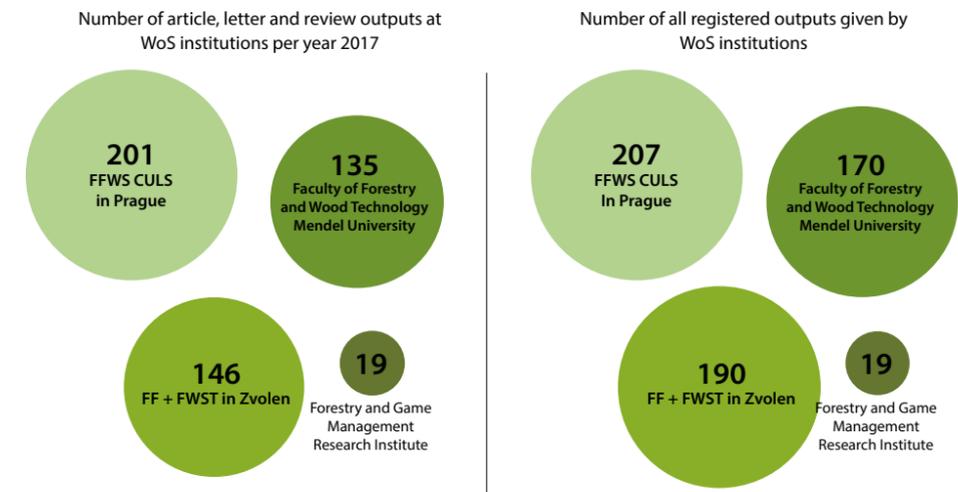


**Comparison with similar sites and faculties of the CULS**

These positive results of increased quality of publishing activities of the Faculty staff are obvious even in comparison with other forestry- and wood-oriented faculties and institutions. A significant share of the FFWS in creative activity in the area of forestry and wood technology is evidenced by the fact that out of the total number of outputs with authors from the Czech Republic in the Forestry category on the WoS in 2017 the FFWS contributed with 34% of the outputs, which is the highest figure among all the institutions in the Czech Republic (out of which a FFWS author is a corresponding author in half of them), while in the Materials Science, Paper and Wood category it was even 65% – again the highest figure among all the institutions in the Czech Republic (see Fig. 6).

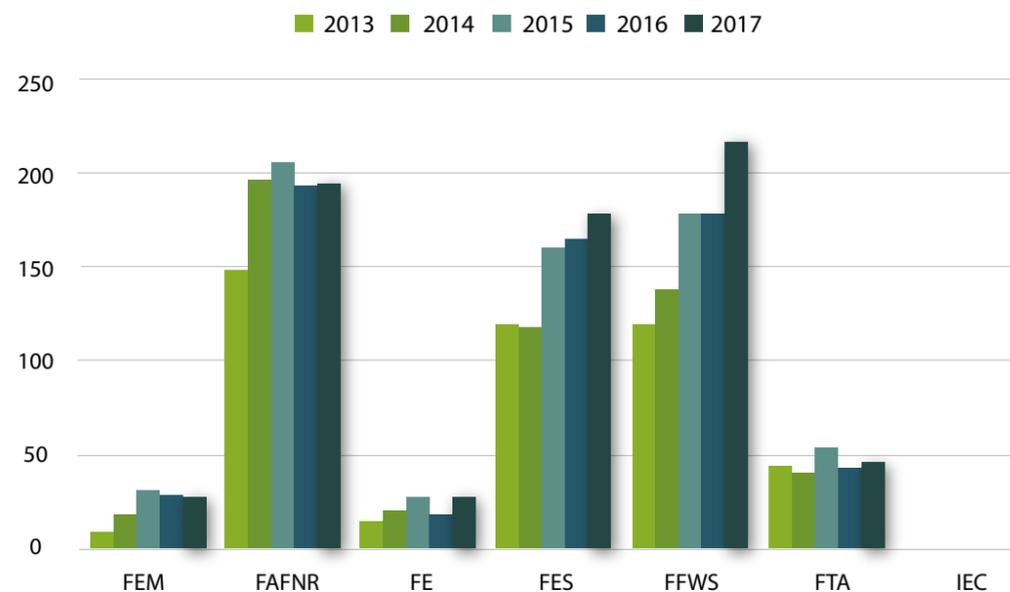
Fig. 8 illustrates the number of IF articles of 4 major forestry institutions in the Czech Republic and in the Slovak Republic in 2017. The values have been taken from the public WoS database. Fig. 8 shows 1) the number of article, letter and review outputs on the WoS, and 2) all outputs registered on the WoS. Since 2013, the FFWS has ranked first in all these parameters among these institutions.

**Fig. 8:** Number of outputs of the given institutions in the WoS database in 2017

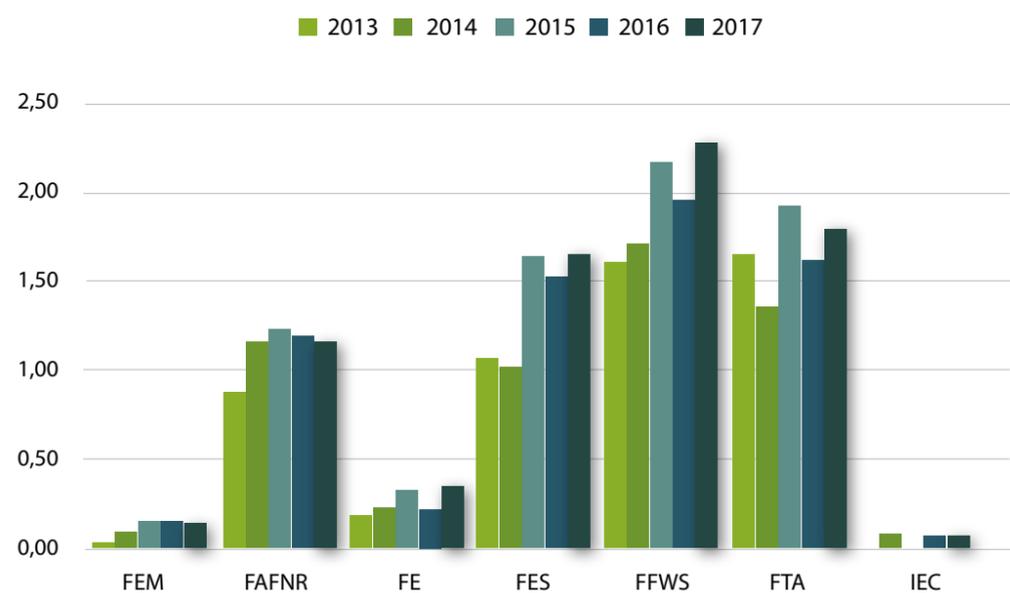


The upward trend in the publishing activity is seen even in comparison with other CULS faculties. Since 2014, the FFWS has been the second faculty most often publishing in IF journals, and in 2017, the FFWS was already the best faculty although it has only half of academic staff in comparison with the Faculty of Agrobiology, Food and Natural Resources (FAFNR) (Fig. 9). The FFWS' upward trend in publishing activities within the University is thus evident in the expression of the number of publications with an impact factor per staff member. In this representation, the FFWS has attained the best position within the CULS for the third year in a row (Fig. 10). Nonetheless, this parameter is not very important for the Faculty. Publishing in the best journals is essential – see above.

**Fig. 9:** Number of publications with an impact factor at individual faculties of the CULS in Prague from 2013 to 2017



**Fig. 10:** Number of publications with an impact factor at individual faculties of the CULS in Prague per member of academic staff from 2013 to 2017



In 2017, the most prolific staff members of the Faculty were as follows: doc. Ing. Milan Gaff, Ph.D., prof. Ing. Miroslav Svoboda, Ph.D., prof. Ing. Jaroslav Holuša, Ph.D. a doc. RNDr. Tomáš Hlásny, Ph.D. Out of PhD students: Ing. Volodymyr Trotsiuk, Ing. Miroslav Sedlecký and Ing. Hana Čekovská, and out of postdocs: MSc. Ram Prasad Sharma and Ing. Martin Mikoláš, Ph.D.

**Overview of FFWS publications in top quality journals:**

See below for publications in 2017 with participation of the Faculty staff listed in the Nature Index journals.

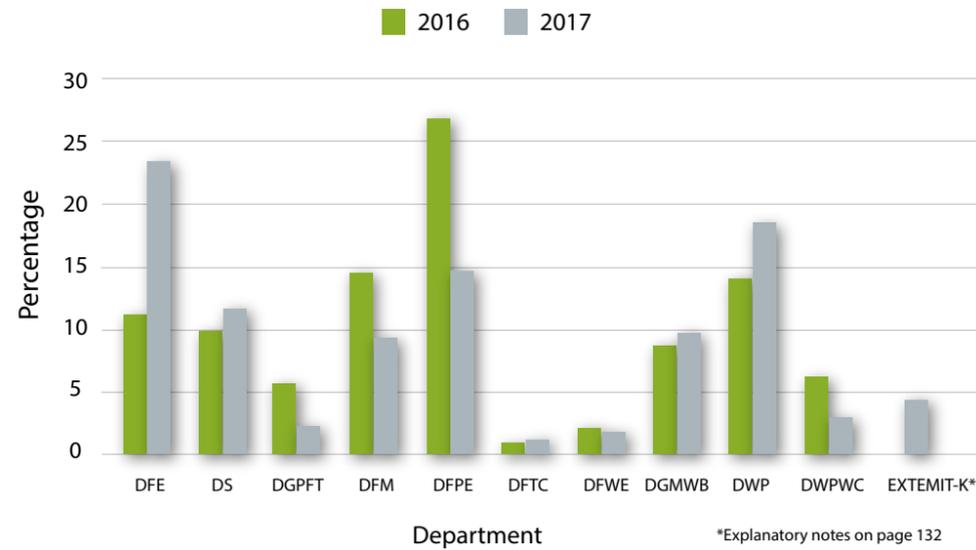
WEN, X. – WEN, P. – DAHLSJO, C. – SILLAM-DUSSES, D. – ŠOBOTNÍK, J. Breaking the cipher: ant eavesdropping on the variational trail pheromone of its termite prey. PROCEEDINGS OF THE ROYAL SOCIETY B-BIOLOGICAL SCIENCES, 2017, Volume 284, Issue 1853, p. 1–8. ISSN: 0962-8452.

DE FOUCHIER, A. – WALKER, W. – MONTAGNE, N. – STEINER, C. – BINYAMEEN, M. – SCHLYTER, F. – CHERTEMPS, T. – MARIA, A. – FRANCOIS, M. – MONSEMPES, C. – ANDERSON, P. – HANSSON, B. – LARSSON, M. – JACQUIN-JOLY, E. Functional evolution of Lepidoptera olfactory receptors revealed by deorphanization of a moth repertoire. NATURE COMMUNICATIONS, 2017, Volume 8, Issue 15709, p. 1–11. ISSN: 2041-1723.

**Publishing activity of the departments**

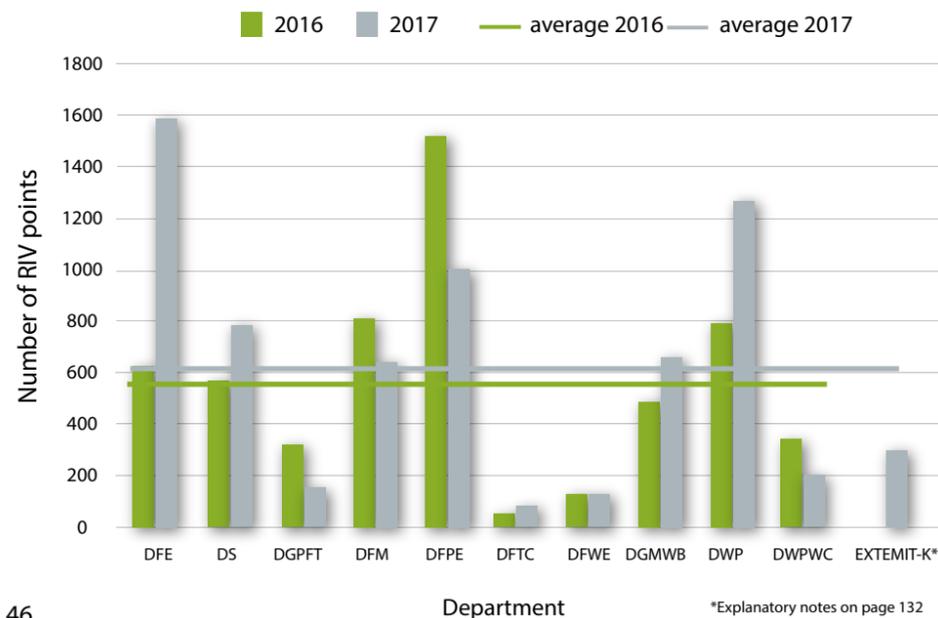
However, the disparity of publishing activities of individual departments still remains apparent at the Faculty level (Fig. 11). In 2017, the largest share of the total publication output was attributed to DFE (23.3%), DPW (18.6%), and DFPE (14.8%). The publication performance of individual departments is illustrated by Fig. 12, which shows the performance of individual departments of the FFWS in 2016 and 2017 measured by the number of points for IF and Scopus publications. The highest increase in the publishing performance in 2017 is clearly seen in the DFE (more than double); on the other hand, the DFPE experienced a marked decline with regard to the percentage of FFWS publications when compared with other departments.

**Fig. 11:** Share of individual departments in the overall publishing output of FFWS S&R in 2016 and 2017

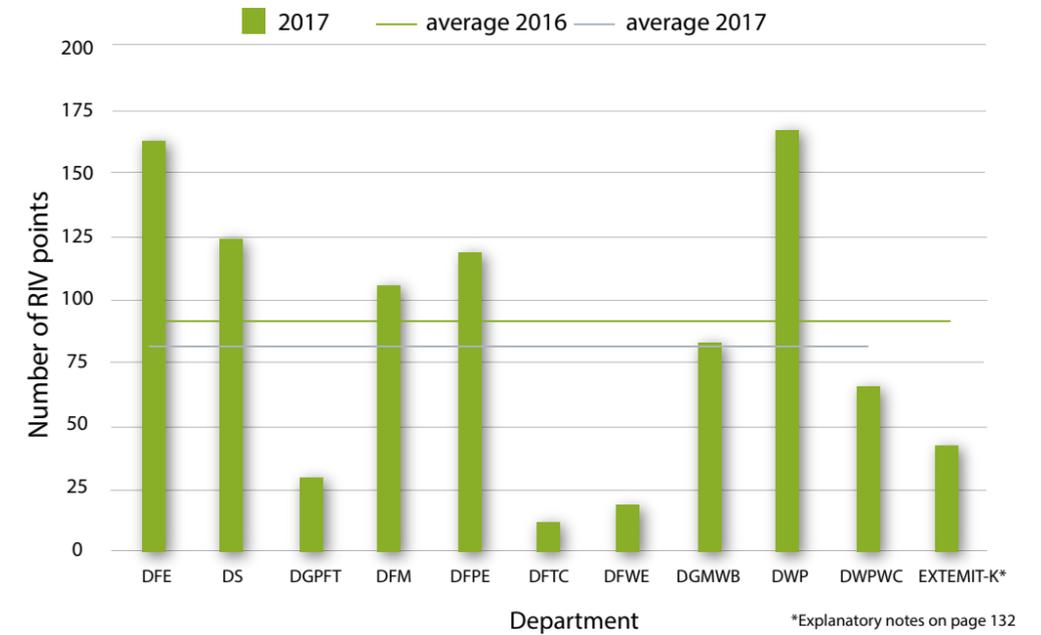


Nevertheless, performance of departments also depends on the number of academic staff. That is why Fig. 13 shows the number of points in publishing activities per full-time employment load of one academic staff member in 2016 and 2017. From this point of view, the best departments are again DFE, DWP, and DFPE.

**Fig.12:** Output of FFWS departments in 2016 and 2017 in number of points for IF and Scopus publications



**Fig. 13:** Average number of points in publishing activities per full-time employment load of one academic staff member in 2017



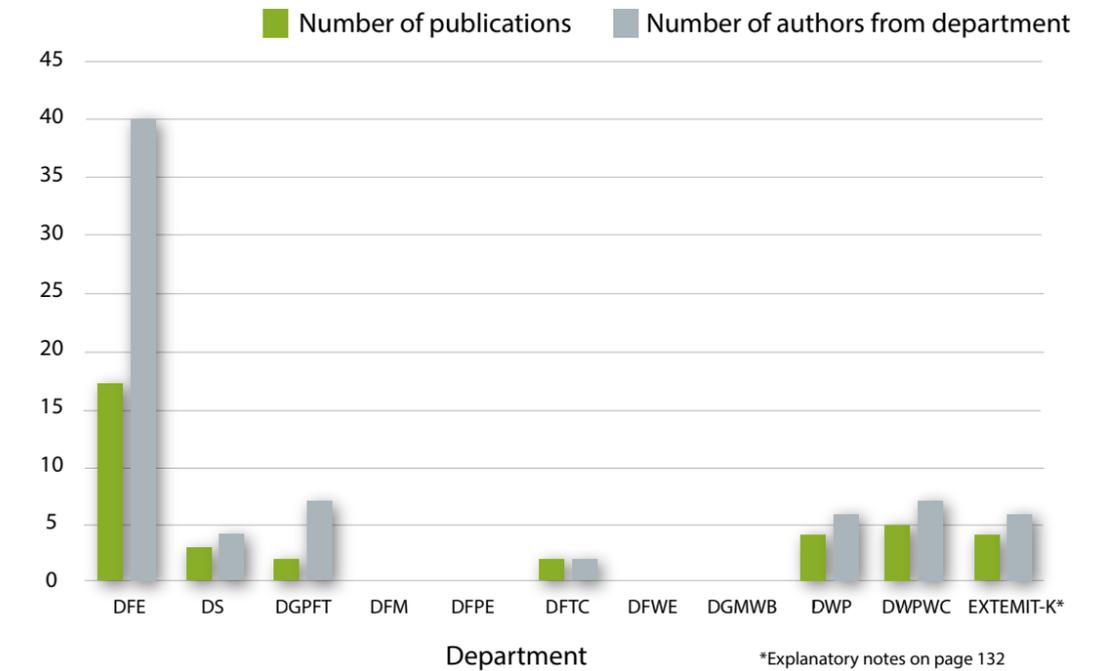
Comparison of an increase in the average number of RIV points per full-time employment load of one academic staff member, which indicates a steadily increasing point value of the FFWS results (see Fig. 13), can be considered as a sign of a progressive positive development in publishing quality.

In 2017, we managed to publish 2 articles in the Nature Index (see above). In the first case, it was an output of the Research Termite Team under the guidance of doc. Šobotník, and in the second case, it was an output of the Extemit-K team under the guidance of prof. Schlyter.

Fig. 14 fully reveals the publishing activity of the departments in the top journals (top 10% of articles in the given category on the WoS according to IF). From this point of view, it is clearly obvious that the Department of Forest Ecology ranks best both in terms of the total number of articles and the number of authors from the Department who published articles in these journals. Postdocs from the said Department were authors of 16 publications. Involvement of postdocs and subsequently of all other staff members in the Department's publishing activities has clearly had a positive impact. Good-quality scientific outputs come namely from the well functioning dendrochronology team from this Department. Overall, the DFE saw an increase by one third in terms of outputs

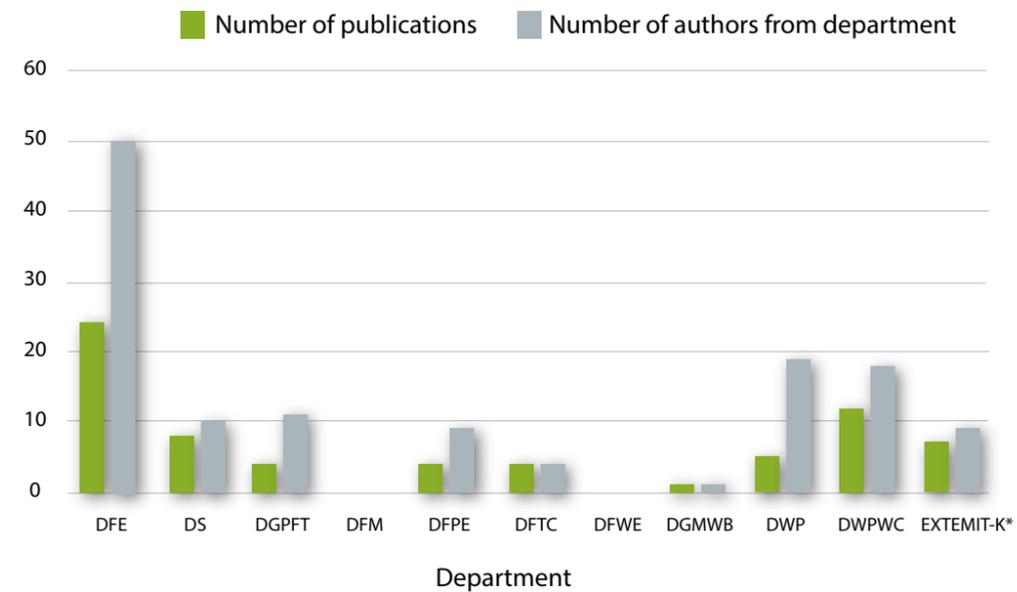
in top 10% in the given category on the WoS as against 2016. The position of other departments is considerably worse in this respect. The Department of Game Management and Wildlife Biology has marked a commencement of its publishing activity boost. It is especially due to the creation of the magnetic team under the guidance of prof. Burda. Other departments which have published articles in journals with top 10% in the given category on the WoS include only the Department of Forest Protection and Entomology, the Department of Genetics and Physiology of Forest Trees, the Department of Silviculture, and the Department of Forest Management. Considerable imbalance among publishing activities of individual departments is probably the biggest current weakness of research and scientific activities of the Faculty. It is becoming obvious that starting up publishing in the best journals in all the departments is imperative. From this perspective, systematic creation of high-quality, well-defined and qualified teams both in and across the departments is of major importance. Even greater employment of high-quality foreign experts must become an important part of the philosophy. At present, it is already clear that foreign scientists are needed not only as postdocs but also as persons involved in the activities of the department and cooperating with all staff members in order to significantly affect the entire structure. The department head plays a decisive role in this respect as it is s/he who has to integrate the scientists into the department's structure and offer them an opportunity to influence the education of staff members in the department with their professional authority. For instance, when a postdoc came to the Department of Silviculture, the publishing activity of that Department rose sharply (the postdoc participated in 11 IF publications out of 16). On the other hand, for the most part, postdoc's publications do not result from activities of a stable team or a well-thought-out concept. Good planning of publishing activities with clear visions for the future in the developing areas of knowledge is to be taken for granted. In 2017, the Extemit-K project started already yielding some results. Fig. 14 shows that the project had more publications than some departments.

**Fig. 14:** Publications of the departments in top 10% of articles in the given category on the WoS according to IF in 2017



In terms of departments' publications in the first quartile of articles in the given category on the WoS according to IF, the best department is also the DFE (Fig. 15). In 2016, the DFE had only 6 articles in such journals whereas in 2017, it was already 24. As against 2016, the DWP experienced a dive as it had 15 publications in the said journals in 2016 whereas in 2017, it was only 4 (it is directly related to the drop of the BioResources magazine from the first to the second quartile). Other departments maintained approximately the same level. The DWPWC and DFTC did not publish any article in journals from the first quartile on the WoS and the DFWE published just one.

**Fig. 15:** Publications of the departments in the first quartile of articles in the given category on the WoS according to IF in 2017

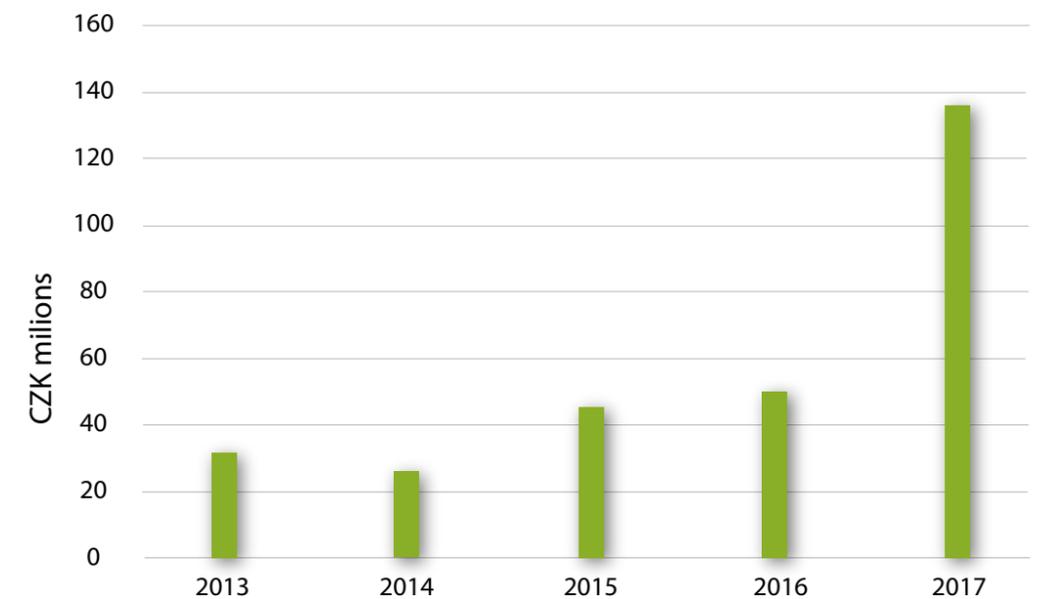


In accordance with this objective aiming at excellence, the FFWS continues in its incentive programme to support publishing and publication activities of the most competent staff members. For the third year, an internal call was announced for the support of staff to produce projects with excellent outputs whose outputs are exactly those articles published in IF journals of excellence. Also, in 2017, it was for the first time that an internal call to support existing excellent teams was invited at the FFWS. Another measure of the Faculty in the framework of this activity is the recruitment of excellent staff members in the field of forestry and timber research, mainly from abroad. Overall, the FFWS employs 25% of academics from abroad.

#### 4.2 Funds for research and development

It is Faculty's aim to be granted mainly major foreign projects and projects under the Operational Programmes and subsequently to implement such projects with a view to meeting their objectives. Each year, the Faculty succeeds to gain support for its creative activities from external project sources – for confirmation see Fig 16. In 2017, the volume of funds more than quadruplicated as against the amount in 2013.

**Fig. 16:** Support granted to the FFWS for creative activities between 2013 and 2017



#### External/foreign grants

Major foreign projects implemented by the Faculty include:

- (I) FORMIT (FP7) – lead partner: Wageningen University, the project is implemented in cooperation with other 10 leading European universities and scientific institutions, 2012–2016;
- (II) SUSTREE (Interreg CENTRAL EUROPE) – lead partner: BFW in Vienna, the project is implemented in cooperation with other partners from Austria, Germany, Czech Republic, Poland, Slovak Republic, and Hungary, in implementation;
- (III) Silva Gabreta Monitoring (Cross-border cooperation programme between the Czech Republic and the Free State of Bavaria) – lead partner: Bavarian Forest National Park, in implementation;
- (IV) Cross-border Mapping of Forest Ecosystems (Cross-border cooperation programme between the Czech Republic and the Free State of Bavaria) – lead partner: Šumava National Park, in implementation;
- (V) FORHEAL (ERASMUS+) – lead partner: University of Helsinki, in implementation;
- (VI) FORSCREE (EFI Network Fund) – lead partner: BOKU Vienna, commencement of implementation in 2018.

For more details about these foreign projects go to Chapter 6 Development of the Faculty.

### Internal grants co-financed from the EU sources and grants from domestic grant agencies

The FFWS is applying for a number of projects, mainly from the Operational Programme Research, Development and Education (OP RDE), Operational Program Prague – Growth Pole of the Czech Republic (OP GPCR) or the Operational Programme Enterprise and Innovations for Competitiveness (OP EIC). Some of the above projects have been already successfully implemented. Good-quality implementation of these excellent projects is considered of principal and paramount importance. Project implementation has engaged some major foreign scientists whose involvement in the FFWS' creative activities has and will have a significant impact on its further enhancement and progress towards excellence in the future. Most of them are prominent experts who are in charge of scientific projects of the Faculty. To name just a few: Prof. Fredrik Schlyter (H-index 29), Dr. Amit Roy (H-index 7), or Dr. Muhammad Binyameen (awarded Fulbright's scholarship). Since 2018, the FFWS projects have been implemented in cooperation with, e.g., doc. Dick Sandberg, Ph.D. – (H-index 13), Univ.-Prof. i.R. Dr.phil. Axel Schopf (H-index 18) or Ao.Univ. Prof. Dipl.-Ing. Dr.nat.techn. Harald Vacik (H-index 13).

For more details and overview of these internal grants co-financed from the EU go to Chapter 6 Development of the Faculty.

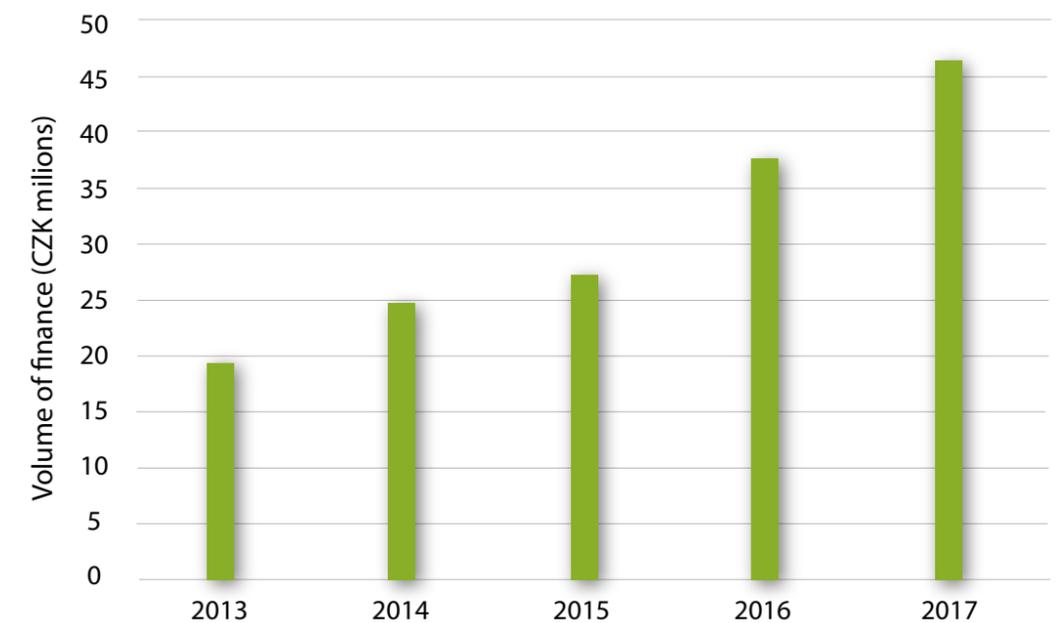
In the long term, over the recent years, the Faculty has been successful in acquiring new projects in all domestic grant agencies and calls every year. The Faculty was quite successful in grant applications submitted to the TA CR as it started implementing 6 projects, 1 project from the GA CR, TA CR and NAZV and several projects from the Grant service of LESY ČR in 2017.

### Institutional support

In connection with an increase in the number of high-quality scientific outputs of Faculty's staff, the amount of support from resources of the Long-term Conceptual Development (DKR) provided by the Ministry of Education, Youth and Sports has been growing

every year. For the period of 5 years, the amount of aid has more than tripled (Fig. 17). Support resources are then used to support the scientific and research activities at the Faculty. It is namely support through an incentive programme for the preparation of publication outputs and human resources development of existing excellent scientific teams. DKR resources are also used to modernise laboratories and instrumentation. In 2017, the funds from investment institutional support (DKR) in the total amount of CZK 46,408,186 were used in acquiring tangible fixed assets and technical improvement of immovable property for scientific and research activities.

**Fig. 17:** Development of the funds volume in the Long-term Conceptual Development (DKR) at the FFWS between 2013 and 2017



### 4.3 Doctoral studies, employment of postdocs, and recent habilitation and professorship procedures

The Faculty has a long-term goal to continue enhancing the quality of doctoral studies. Students have to meet higher and higher requirements and demands for their studies, in particular, in the area of their publishing activities, fulfilment of their individual study plans and the quality of their dissertations.

Similarly to the Faculty staff, also doctoral students have an increasing number of output as

well as their quality. In 2013, doctoral students participated in 38 publications with IF (120 doctoral students) whereas in 2017, it was already 94 publications with IF (168 doctoral students). In 2013, only 3 publications of doctoral students were published in journals from TOP 10% on the WoS whereas in 2017, it was already 11. Publishing activities of doctoral students are increasing, which is evidenced by 11 CULS Rector's Awards for publishing activities granted to PhD students out of all 20 awarded students (the FFWS PhD students took the first three places). Ing. Volodymyr Trotsiuk, Ph.D. was granted the Award of Prof. Stoklasa by the CULS Rector for his overall publishing activity during doctoral studies and for his dissertation. In 2017, RNDr. Jaroslav Čepl, Ph.D., young FFWS scientist, ranked first in the competition for the prestigious Award of the Minister of Agriculture for Young Scientists for the best implemented output of research and experimental development.

R&D support for PhD students was directed, among other things, to specific research. The Internal Grant Agency (IGA) supported 31 individual projects and 9 team projects in 2017. Overall, 59 students (including students who acquired a two-year project in 2016) were supported from specific research resources in 2017. The total amount of supported funds exceeded CZK 5 million in 2017. The Master 2017 student scientific conference organised by the FFWS, and other smaller conferences and seminars held at the FFWS

were supported from the specific university research budget. The quality of completed projects, especially of their outputs, has been increasing every year. It is evidenced by an increased number of outputs. In 2017, the outputs of IGA projects constituted total of 65 publications that had already been published in journals with an impact factor.

In addition to support from the Faculty IGA, students of doctoral study programmes have an opportunity to receive a university-wide multi-annual grant from the University Grant Agency (CIGA). In 2017, the FFWS PhD students were addressing 17 projects. The total annual financial aid reached nearly CZK 5 million. The total support of PhD students from the specific research budget thus equalled some CZK 10 million.

Thanks to the large volume of funds for science and research, the FFWS doctoral students are intensely engaged in projects and creative activity. This process is systematically managed by the departmental project coordinators.

In order to increase the range of their experience, skills and international contacts in the field of scientific and research activities, the PhD students were also encouraged to travel abroad. In 2017, funds from the Institutional support for PhD students (IP) were used to support PhD students going abroad for internship lasting at least one month. Overall, the IP allocated for S&R was used to support 6 trips, and 20 trips of DSP students were supported under the IGA projects. The

Faculty held lectures and courses for PhD students to raise the level of their expertise in scientific and research activities. In 2017, 9 graduates successfully completed their doctoral studies. It is fewer than in previous years; however, this situation is beginning to reflect increased demands on the quality of students and their outputs as explicitly listed in the relevant regulations issued by the Dean.

Excellent experts from abroad, e.g. from the Swedish University of Agricultural Sciences, University of Göttingen, University of Natural Resources and Life Sciences Vienna, Wageningen University, etc. take part in lecturing as well as preparing new doctoral programmes (Global Change Forestry; Applied Geoinformatics and Long-distance Earth Exploration in Forestry; Wood and Wood-

-based Materials Fire Protection). In order to increase the quality of doctoral studies and creative activities of PhD students, we gradually engage some experts from these universities at the CULS as external lecturers and professional consultants (e.g. Ao.Univ. Prof. Dipl.-Ing. Dr.nat.techn. Rupert Wimmer – BOKU University of Natural Resources and Life Science Vienna, Prof. i.R. Dr.-Ing. habil. Dr. h.c. Peter Niemz – Bern University of Applied Sciences, doc. Dick Sandberg – Luleå University of Technology). These lecturers are simultaneously employed by the FFWS and work on excellent projects.

In 2017, we enrolled 6 good-quality postdocs from other universities in the Czech Republic and abroad. We are going to continue in enrolment also in 2018 as our plan is to enrol some other 20 sound postdocs (with regards to the EVA4.0 project which is being implemented). In 2017, total of 15 postdocs were employed out of which several were from abroad (e.g. Canada, Nepal, France, Finland, or Slovakia). Their scientific activity has been linked to the existing scientific teams and they have also participated in the preparation of publications together with staff members of individual departments. In 2017, postdocs were authors or co-authors of 39 scientific papers published in journals with an impact factor (32) and in journals in the Scopus database (7) (e.g. Forest Ecology and Management, Trees – Structure and Function, PLoS One). Most of postdocs have been involved in the preparation of project



proposals. The introduction of these positions has been clearly beneficial for the departments where the postdocs work. In one of the departments (DOC), one postdoc even contributed with 11 out of 16 IF publishing outputs. It is thus clear that when a person with high publishing productivity comes to the site which was previously low in publishing activity, s/he can make a fundamental difference. On the other hand, the postdoc's potential should be used for transferring of such skills to other staff members of the department. The department head has to demonstrate their managerial capacity, otherwise the postdoc's potential is wasted, and the whole philosophy of support of postdocs is misunderstood. Postdocs have thus generally contributed to the expansion of new views of departmental scientific teams of the investigated issues and to enhancement of education of PhD students in these departments; nevertheless, in some cases, lack of proper utilisation by the department heads hinders their optimal use.

It is the Faculty's long-term strategic objective to employ excellent PhD graduates and get them involved in the activities of the FFWS. That is why, in 2017, the Faculty employed two such graduates who are promising due to their qualities, prospects and potential for the future of both scientific and research activities and teaching activities.

The Faculty further emphasises the promotion of qualification of its employees in acquiring academic titles. From this point of view, it is gratifying that in 2017, there were two successful habilitation procedures at the Faculty based on which two staff members were appointed associate professors. Given the current requirements of the National Accreditation Authority, the gradual increasing of the number of associate professors and professors is desirable. Nonetheless, habilitation procedures and appointment of professors are conditioned by strict compliance with internal rules of the Faculty and answering of the following question: is the candidate for associate professor or professor a prominent personality in their field with own scientific school, established team and respect to the same both at home and abroad. Acquisition and successful management of scientific projects is taken as a matter of course especially in the case of candidates for professors.



Internationalisation

5

## 5 Internationalisation

In 2017, the FFWS' activities in the sphere of international relations focused on applying the updated "Development Strategy of the FFWS in the Field of Internationalisation for 2017". Within this framework the activities in the area of internationalisation resumed the efforts of the Faculty leading to improvement of studies and teaching, activities in international organisations, and communication with foreign institutions aiming at seeking new strategic partners abroad to enrich the pedagogic and research activity. These areas have been tackled through involvement of the Faculty in the Erasmus+ programme supporting the mobility of staff and students, activities in international organisations, and bilateral agreements with strategic partners.

### 5.1 Activity of the FFWS in international bodies and organisations

#### 5.1.1 Activity of the FFWS in international institutions

The FFWS has been a long-time member of the European Forest Institute (EFI) in Joensuu, Finland. This institution is the most important European forestry research organisation, in recent years also with a significant outreach outside of Europe. In 2017, an active approach and cooperation with EFI has been intensified which has served as a basis for cooperation and joint events organised in 2018. Academic staff from the Faculty participate at important meetings organised or co-organised by the EFI on a regular basis. Within the framework of the EFI, the FFWS also participated in the activities of the EFI Regional Office for Central and Eastern Europe (RO EFI CEEC) in Vienna as one of the core members under a long-term agreement between the CULS and EFI.

The FFWS is also an effective active member of the most important global association of forestry research organisation – International Union of Forest Research Organisations (IUFRO) – in whose structure many FFWS staff members hold various positions. Namely, these are the positions of coordinators or deputy coordinators of research and project groups within the individual IUFRO divisions. The position of the FFWS has been reinforced by Prof. Šišák becoming the representative of the Czech Republic in the IUFRO International Council. Members of the Faculty participate and directly get involved in organising various activities of the IUFRO, especially conferences, seminars, symposia and workshops in the

framework of their specialist research and working groups in individual divisions. In 2017, it was primarily the Global Congress in Freiburg held on the occasion of the 125th anniversary of establishment of IUFRO where the FFWS staff members were present either directly as organisers or co-organisers of specialised sections and panel discussions.

The FFWS is also involved in the activities of the Interuniversity Consortium for Agricultural and Related Sciences in Europe (ICA) – in particular, within the framework of the SILVA Network whose annual conference was organised and supervised by the FFWS in 2017.

In the educational field, the FFWS is also active in a major European organisation bringing together representatives of forestry faculties of universities in Europe – Conference of Deans and Directors of European Forestry Faculties and Schools (CONFEST).

In 2017, the FFWS joined the programme of cooperation between China and 16 countries of Central and Eastern Europe (CEEC) known as “16+1 Cooperation”. Under this programme, the FFWS staff took part in scientific activities of working groups and co-organised specialised sections at the CEEC conference held in Beijing.

In addition to the above stated, the FFWS student organisation is a member of the highly prestigious international organisation of forestry students – International Forestry Students' Association (IFSA) – in whose functioning it is actively involved. The Faculty supports the activity of students in this organisation also financially.

### 5.1.2 Activity of the FFWS staff in international bodies and organisations

The FFWS staff members hold various, often leading positions in international bodies, organisations, and institutions where the Faculty is a member. Total of 9 staff members of the FFWS held various organisational and managerial positions in the most prestigious international forestry organisations, IUFRO and EFI. The staff members were actively engaged in various international organisations and working groups, including the COST projects (European Cooperation in Science and Technology). Besides the listed activities, 16 employees holding 27 memberships in editorial boards have been active in those, or as the guest editors (International Journal of Remote Sensing; Forests; Journal of Forest Science; Central European Forestry Journal; European Journal of Entomology; Studies and Reports, Taxonomical Series; Annals of Forest Research). A nominal overview of the FFWS

staff members' significant organisational management functions in international organisations and institutions in 2017 is given below.

#### **Staff with organisational and managerial functions in the IUFRO in 2017:**

Ing. Jan Kašpar, Ph.D.: Deputy Coordinator of the IUFRO Subunit 4.04.07 Risk analysis

Prof. Ing. Ivo Kupka, CSc.: Deputy Coordinator of the IUFRO Subunit 4.01.02 Growth models for tree and stand simulation

Prof. Ing. Milan Lstibůrek, MSc, Ph.D.: Coordinator of the IUFRO Subunit 2.04.02 Breeding theory and progeny testing

Prof. Ing. Róbert Marušák, PhD.: Coordinator of the IUFRO Unit 4.04.00 Forest management planning

Prof. Ing. Miroslav Svoboda, Ph.D.: Deputy Coordinator of the IUFRO Subunit 8.01.01 Old growth forests and forest reserves

Prof. Ing. Luděk Šišák, CSc.:

- the representative of the Czech Republic in the IUFRO International Council;

- Deputy Coordinator of the IUFRO Unit 4.05.00 Managerial economics and accounting

#### **Staff members representing the FFWS in EFI and other major international forestry organisations in 2017:**

doc. Ing. Vilém Jarský, Ph.D.: representative of the FFWS in the EFI RO CEEC

Prof. Ing. Vilém Podrázský, CSc.: Chairman of the UEAA – Union of European Academies related to Agriculture

doc. Ing. Jiří Remeš, Ph.D.: representative of the CULS FFWS in the Silva Network

doc. Ing. Ivana Tomášková, Ph.D.: representative of the FFWS in the EFI RO CEEC.

Prof. Ing. Marek Turčáni, PhD.:

- representative of the FFWS CULS in CONFEST – the Conference of Deans and Directors of European Forestry Faculties and Schools

- representative of the FFWS in the EFI, Joensuu, Finland

The representation of the FFWS in the excellent European organisation of seven universities, including the CULS in Prague – Euroleague for Life Sciences Universities (ELLS) – dealing with science and education in the field of life sciences. The FFWS was represented in the working groups of the ELLS (Subject Areas) by:

doc. Ing. Miroslav Hájek, Ph.D.: Bioeconomy working group  
 Prof. Ing. Jaroslav Holuša, Ph.D.: Insect Ecology working group  
 Prof. Ing. Vilém Podrázský, CSc., doc. Ing. Jiří Remeš, Ph.D.: Forestry working group

#### **Staff members with organisational and managerial positions in the editorial boards of international scientific journals:**

doc. PaedDr. Jan Farkač, CSc.: Editor-in-Chief of the Studies and Reports, Taxonomical Series  
 Prof. Ing. Jaroslav Holuša, Ph.D.: Executive Editor of Central European Forestry Journal  
 Prof. Ing. Jaroslav Holuša, Ph.D.: Associate Editor of the European Journal of Entomology

#### **5.1.3 The most important foreign partners**

The most important foreign partners with which an intensive cooperation was deepened in 2017 on the basis of bilateral agreements included: Swedish University of Agricultural Sciences in Uppsala, University of Life Sciences Warsaw, Technical University in Zvolen, University of Joensuu, Polytechnic University of Madrid, University of Natural Resources and Life Sciences Vienna, University of Alberta, University of Vancouver, Laval University Quebec, University of California, University of Missouri, Universidade de Evora, Koszalin University of Technology, Trás-os-Montes and Alto Douro University.

Cooperation in the areas of pedagogic and, especially, research activities intensified with one of the main strategic partners, the Swedish University of Agricultural Sciences in Uppsala (SLU). Through its excellent staff members the SLU was involved in the EXTEMIT-K excellent project. The SLU staff members also work as the External Advisory Board members in this project. The SLU together with other major universities such as the University of Eastern Finland, the Universität für Bodenkultur Wien, the University of Duisburg-Essen are the chief foreign partners of another excellent project titled EVA4.0, which the FFWS obtained and started implementing in 2017.

In 2017, the FFWS also continued intensively cooperating with other universities both in and outside the EU, e.g. with universities in Kazakhstan (in particular, with the Kazakh Na-

tional Agricultural University in Almaty and S. Seifullin Kazakh Agro Technical University in Astana) within credit mobility.

## **5.2 Involvement of the FFWS in international educational programmes, including the mobility programmes**

### **5.2.1 Erasmus+ programme**

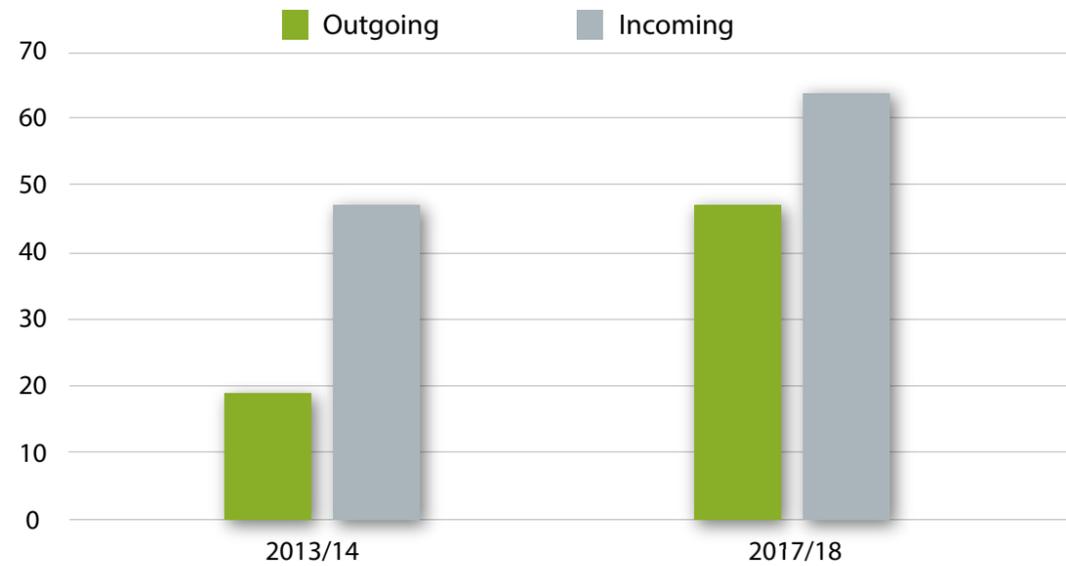
It is namely the ERASMUS+ programme, launched for the EU programming period of 2014–2020 in the winter term of the academic year 2014/2015, which holds a significant position in the area of internationalisation of education at the FFWS. Since then, the FFWS has prepared and concluded, or updated a number of bilateral agreements with foreign institutions. The number of these agreements has increased by a third over this period. At present, the FFWS has a total of 63 agreements with universities from 22 countries.

FFWS students' mobility has been supported by a number of incentive measures. In order to enhance the competence of our students and facilitate their trips, in 2017, the Faculty continued in providing special courses of professional English for both the students and the staff members. Implementation of this supporting programme has been reflected in the number of outgoing students, which was higher by 15% in 2017 (Fig. 18) than in 2014, when the FFWS launched the specialised language courses. FFWS students go especially to the Universität für Bodenkultur Wien, the Swedish University of Agricultural Sciences, the University of Eastern Finland, the University of Helsinki, the Universidad Politécnica de Madrid, and the Technische Universität München.

Besides study stays, the FFWS students also take part in internships. Due to increasing of students' motivation and using support under the Institutional Programme, the number of students going to internship doubled in 2017 when compared with 2014.

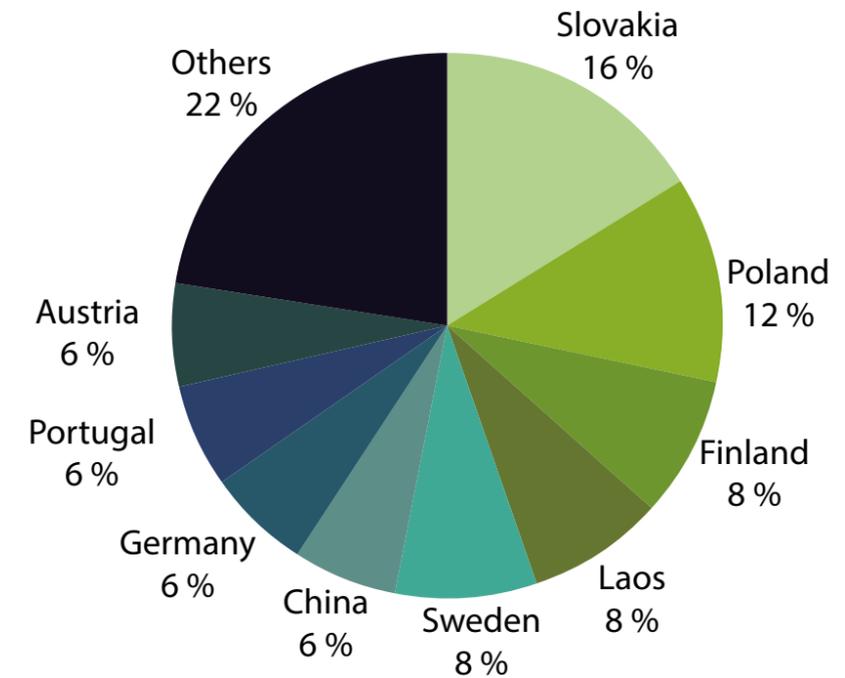
Students from foreign universities are also interested in studying at the FFWS for one or two terms as part of the study mobility programme. Sixty-four foreign students came to the FFWS in 2017, which is a 36% increase compared with the academic year 5 years ago. Foreign students are most interested in specialised subjects in the Forestry, Water and Landscape Management branch.

**Fig.18:** Comparison of the number of outgoing and incoming students with the academic year 5 years ago



The mobility of academic staff under Erasmus+ is also very important. In 2017, there was the same trend as in recent years, i.e. predominance of shorter-term trips with 7 to 10 days in length. FFWS staff visited institutions in 18 countries. They went most often to universities in Slovakia, Poland, Finland (Fig. 19) and Laos because the FFWS together with the University of Helsinki and the University of Freiburg participate in the FORHEAL (Forestry Higher Education Advancement in Laos) project consortium.

**Fig. 19:** Proportion of staff trips per country



**5.2.2 Summer schools, short-term courses and student activities**

As traditionally the case, the FFWS in cooperation with the Faculty of Forestry of the Warsaw University of Life Sciences held a short-term course “Silviculture in the Central Europe”. In 2017, this FFWS course was attended by 90 students from Poland, and 65 students from the FFWS at the FF in Warsaw. The course focused on the silviculture in the conditions of Central Europe.

The summer school “Genomic Selection and Breeding without Breeding Strategy”, attended besides FFWS students also by students from Germany, Croatia, Finland, and Austria, was a significant event too. In 2017, the FFWS also organised the summer school “Annual study abroad excursion focused on environmental impact assessment and forestry” for 33 students from the USA and 7 students from Sweden.

**Student activities**

Besides study stays, the FFWS students also take part in other international activities, both in the context of ELLS (Euroleague for Life Sciences) and through their involvement in IFSA (International Forestry Students’ Association). In 2017, total of seven FFWS students took part in international events held by IFSA.



Development of the Faculty

6

## 6 Development of the Faculty

The year 2017 was very successful for the Faculty in terms of project implementation, acquisition of new projects, and further development of the Faculty. During 2017, implementation of the EXTEMIT-K project, which aims to create an excellent scientific team at the FFWS, was successfully launched. Under this project, in 2017, new laboratories in the total value of CZK 12 million were reconstructed, and other investment assets in the total value of CZK 35.3 million were purchased. The FFWS also managed to enrol a number of excellent foreign and Czech scientists.

In addition, the Faculty acquired projects from the OP in the total value exceeding CZK 600 million during the year. The aim of these projects is to enhance scientific excellence through the creation of a robust international scientific team, modernisation of teaching through the construction of a new high-tech educational pavilion, preparation of new doctoral study programmes or, e.g., support of application research, and technology transfer from university to commercial practice.

The Development Department also stabilised its activities in 2017, becoming thus an integral part of Dean's offices at the Faculty. The main activities of the Department include:

- Active search for grant opportunities for the FFWS;
- Consultancy in the field of European subsidies;
- Comprehensive preparation of project applications for the European Structural and Investment Funds (ESIF), namely from the OP RDE and OP GPCR, and other European programmes such as HORIZON2020, Erasmus+, and Interreg CENTRAL EUROPE;
- Administration of projects during implementation and sustainability periods;
- Project reporting to providers of subsidies;
- Support of projects in the preparation of public procurements;
- Promotion of technology transfer from R&D to commercial sphere;
- Support of cooperation between the Faculty and practice;
- Other developmental activities of the Faculty.

Approval of the EVA4.0 excellent research project (Excellent research as the support of the Adaptation of Forestry and Wood Processing to the Global Change and the 4th Industrial Revolution) with the total budget of CZK 350 million and implementation period of 5 years may be considered as one of the greatest achievements of the Faculty. The project objective is to establish the EVA4.0 Research Centre of Excellence at the CULS FFWS aimed at solving the up-to-date as well as future problems in the area of forestry and wood technology in the Czech Republic caused by the global change, by means of seeking excellent, scientifically proven results inevitable for the involvement of both forestry and wood technology in Industry 4.0. Among other things, the project will provide for necessary human resources and modern infrastructure, which will together with excellent research allow for acquisition of a higher number of international projects and publications in journals of the highest quality.

In April 2017, the Ministry of Education, Youth and Sports announced the results of the Four Calls (four complementary calls of the European Social Fund and the European Regional Development Fund aimed at enhancing the quality of education and research and building of research and innovation infrastructure). Having faced a tough competition, the FFWS succeeded with all four submitted projects. The joint all-university MOST project in which the FFWS is also involved to a large extent was also approved.

Thanks to these projects, in the coming years, the FFWS will be able to build a top high-tech technological and educational pavilion serving the needs of new and re-accredited Bachelor's and Master's study programmes, to create new doctoral study programmes, to equip the existing classrooms with new instruments, to enable PhD students to serve internship for the whole term, to increase the number of trips of scientists abroad, to provide for greater involvement of students with specific needs, students from socioeconomically disadvantaged groups or ethnic minorities, etc.

Under these projects, the Faculty is going to prepare re-accreditation of the following existing Bachelor's and Master's study programmes: Forestry, Forest Engineering, Preservation of Natural Objects and Taxidermy, and Wood Engineering. The FFWS intends to accredit two new study programmes: the Systematic Arboristics undergraduate programme and the Wooden Structures and Wood-based Constructions graduate programme. PhD students will be able to choose from three new study programmes: Applied Geoinformatics and Long-distance Earth Exploration in Forestry, Global Change Forestry, and Forest, Wood and Wood-based Materials Fire Protection.

At the turn of spring and summer, the FFWS prepared two projects (VODA and WAMOS) focusing on pre-application research and submitted them to Call No. 25 under the Ope-

ration Program Research, Development and Education. Both projects met the formal criteria and acceptability criteria; nevertheless, the results of factual evaluation were not known by the end of 2017. However, presently we already know now that the projects have not been funded.

The FFWS also took a significant part in preparation of all-university projects aimed at increasing mobility of scientists, acquiring of equipment for teaching purposes and, e.g., again at technology transfer to commercial sector.

Besides the projects under the Operational Programme Research, Development and Education, at the beginning of summer, the FFWS managed to obtain a project under the Operational Program Prague – Growth Pole of the Czech Republic which will focus on technology transfer from the CULS environment to commercial sector with the aim of developing the urban area of the city of Prague.

In the second half of 2017, the Faculty started concentrating more on grant opportunities from foreign programmes in compliance with the FFWS strategy in the area of further development. WIDESPREAD-05-2017 call: By means of Twinning under the prestigious Horizon 2020 programme, the SHERMAN project plan was submitted in cooperation with the Swedish University of Agricultural Sciences (SLU), the University of Eastern Finland (UEF), and the University of Freiburg (ALU-FR).

In summer 2017, the FORHEAL project under the ERASMUS+ programme was also approved. It was prepared in March of the same year with the main objective to strengthen the higher education system in Laos with the help of the best European forestry universities. The project is managed by the University of Helsinki (Helsingin Yliopisto), Finland, in cooperation with the Alber-Ludwigs-Universität in Freiburg, Germany, and our CULS Faculty of Forestry and Wood Sciences in Prague.

The FFWS also decided to apply for funding of two projects aimed at bioeconomy under the call invited by the European Forest Institute (EFI) – once in the position of the main project leader and once in the position of a project partner under the guidance of BOKU, the prestigious Vienna University.

At the end of the year, two projects were also being prepared for the Interreg CENTRAL EUROPE programme. The CLIMTOOL project in coordination with the CULS FFWS should focus on transfer of new methods, including the use of modern equipment such as drones into forestry practice with the aim to devise strategies and action plans for sustainable management of spruce forests affected by the climate change. The objective of the INTERURBAN, project, which should be coordinated by the Hungarian Lower Tisza District Water Directorate, is to find a solution for urban flooding for cities utilising the integrated

water management principle thanks to involvement of a broad spectrum of experts from Central Europe. Given the cross-border nature of the issue, both the projects should be implemented in cooperation with a wide range of partners from Central Europe.

## Projects implemented in 2017

### **Building up an excellent scientific team and its spatiotechnical background focused on mitigation of the impact of climatic changes to forests from the gene levels to the landscape level (in short EXTEMIT-K)**

The purpose of the EXTEMIT-K project is to upgrade the science level at the FFWS to excellence in the long-term horizon, namely through the following aims:

- building up a 17 member excellent scientific team,
- infrastructure modernisation,
- intensification of international cooperation.

The project is being solved in cooperation with a strategic partner – Swedish University of Agriculture.

The scientific team is aiming at solving the present and future problems in the forest ecosystems in the Czech Republic caused by the climate change and in searching for scientific solutions in protection of forests as carbon absorbers. The project emphasises the most significant disturbance factors (bark beetle and related abiotic factors – mainly climatic extremes) at three levels:

- Gen (Gene) – sub-project G,
- Strom (Tree) – sub-project T,
- Krajina (Landscape) – sub-project L.

The excellent scientific team task is the research in the area of interaction between the bark beetle and the coniferous trees with the use of genomics, transcriptomics, and proteomics together with verifications from genetics and metabolomics (chemical ecology) and verifications of the relationship of tree/bark beetle physiology at the tree and landscape levels. Mapping of the typical disturbance regimes and mitigation strategy proposal for their management will represent a significant output.

### **Conservation and sustainable utilisation of forest tree diversity in climate change (in short: SUSTREE)**

The SUSTREE project, financially supported from the Interreg CENTRAL EUROPE programme, was implemented for the second year in a row in cooperation with partners from six Central European countries – namely Austria, Germany, Slovakia, Poland, Hungary, and the Czech Republic. The leading partner in the project is Bundesforschungs- und Ausbildungszentrum für Wald, Naturgefahren und Landschaft, Vienna, Austria. The total project budget is approximately EUR 1.8 million, of which the share of FFWS is approximately EUR 211,000. The implementation should be completed by 31 July 2019. The main goal of the SUSTREE project is the support of the forest ecosystems adaptation to the global change through international management of the genetic sources of forest woody plants. The project outputs will have the form of maps, instructions of cross-border transport of seeds and access to the national registers of the reproductive material of forest woody plants.

In October 2017, the CULS as one of project partners held a workshop in Prague aimed at analysing intraspecific phenotypic response of forest trees to the climate change. Since last year, the SUSTREE project filming has continued in order to make available the existing project results to both, professionals and the general public, and to highlight the issue of transfer of reproductive material in the context of the global change in the conditions of Central Europe.

### **Silva Gabreta Monitoring – Cross-border Biodiversity and Water Regimes Monitoring Implementation**

The project aims to create a functional infrastructure for cross-border monitoring networks and to monitor the biodiversity of forests, peatlands, and waters using standardised state-of-the-art methods in both national parks, i.e. the Bavarian Forest and Šumava National Parks. The project will also allow for sharing and analysing of data from the jointly developed biodiversity databank. The results will serve as a significant basis for further measures taken with the aim of closer cooperation in conservation management in the shared area of the Bohemian-Bavarian Šumava. The cross-border application of standard methodologies will allow for creation of a uniform set of data, which will be a valuable basis for improving conservation and scientific cooperation of neighbouring national parks. The project is financially supported from the Cross-border cooperation programme between the Czech Republic and the Free State of Bavaria Target (ETC Objective) 2014–2020. The Nationalpark Bayerischer Wald is the project leader with other partners being

the CULS FFWS, the Šumava National Park, Senckenberg Gesellschaft für Naturforschung, and the Masaryk University.

The first statistical analyses were conducted in 2017, concentrating mainly on the forest structure and natural regeneration. The first data processing was focused on the regeneration of tree species, species composition, and herbal layer diversity. As regards regeneration of tree species, the species composition was analysed in relation to the variables of the environment and micro-sites where individual trees grow. Herbs were analysed in order to identify the composition of herb diversity within the studied territory.

### **Cross-border Mapping of Forest Ecosystems – Path to the Common Management of the Šumava and the Bavarian Forest National Parks**

The project objective is to collect data on the structure and species composition of forest ecosystems throughout Šumava, i.e. on the territory of the Šumava National Park and the Bavarian Forest National Park, using the innovative airborne laser scanning method (LiDAR). These results can significantly contribute towards simplification of decision-making regarding the management of individual areas and thus improve the natural conditions. The project also focuses on appropriate method of management of grouses, which should result in improvement of the state of individual populations.

The project is financially supported from the Cross-border cooperation programme between the Czech Republic and the Free State of Bavaria Target (ETC Objective) 2014–2020. The Šumava National Park Administration is the project leader with other partners being the CULS FFWS, the Nationalparkverwaltung Bayerischer Wald, and the Institute of Botany of the Czech Academy of Sciences.

During 2017, the cross-border permanent area was demarcated, reconnaissance and survey of the terrain in the area of interest were carried out, the data collection methodology was prepared in collaboration with other partners, and supporting documents for announcement of selection procedure for collection of data in the research area were prepared. At the end of the growing season, a geodetic control network consisting of geodetic points was demarcated in the established permanent area. It will be used for collection of data regarding the forest structure in the next year.

## **Projects approved in 2017 launched in the same year**

### **Excellent research as the support of the Adaptation of Forestry and Wood Processing to the Global Change and the 4th Industrial Revolution (in short: EVA4.0)**

In November, the Faculty of Forestry and Wood Sciences had success in one of the most significant national competitions for support of excellent research when it ranked fifth with its EVA4.0 project among 130 competing project applications evaluated in two rounds.

The aim of the submitted project is construction of a new organisational unit (named EVA4.0) within the FFWS of the CULS that would be lead by excellent scientists from the USA, Europe but also from the Czech Republic, and which would research scientific problems in the material areas on a global level. The scientific team would thus create a 50 member collective core that would be consisting, in case the project is approved, of newly recruited excellent scientists in the position of a project leader and leaders of three scientific programmes, then key foreign and domestic scientists in the position of leaders of sub-programmes (overall, 17 excellent scientists), as well as domestic scientists at the level of individual scientific sections (more than 25 experts). Another significant part of the team ought to be formed by the highly motivated postdocs (domestic as well as foreign in total of 20 persons), the PhD students (30) and related foreign experts (more than 30).

The project is aimed at solving the up-to-date as well as future problems in the area of forestry (including the biological foundations of the forest ecosystems in temperate, and partly also subtropical and tropical zones) and forestry in the Czech Republic caused by the global change, and at seeking excellent, scientifically proven results inevitable for the implementation of both of the areas into Industry 4.0. The project emphasises the most important areas where the research is urgently necessary, namely at the level of the following three programmes:

- Biology – programme B,
- Forestry including the support of decision making for all of the three programmes – programme L,
- Wood Processing – programme D.

### **Modernisation of the Study Programmes and Studies, Quality and Counselling at CULS Prague (in short: MOST)**

In spring 2017, approval was given to the all-university project MOST aimed at improving the quality of the provided university education through the improvement of the expert level quality of the academic staff, rewriting the existing and creating new study

programmes that take the modern methods of education, the needs of work market and real life situations into consideration, allowing for the demands of the special needs of students, and introducing the quality evaluation system and strengthening the strategic management of the CULS.

The overall planned budget of the submitted project was CZK 250 million, of which almost CZK 21 million ought to be credited to the FFWS. The period of implementation was intended to be five and half years from 1 April 2017 until 30 September 2022.

Through the project, the FFWS intends to accredit two new study programmes in reflection to the needs from the real life (Systematic Arboristics undergraduate programme and a follow-up graduate programme Wooden Structures and Wood-based Constructions) and to newly re-accredit three programmes (follow-up graduate programme Wood-processing Engineering and undergraduate programmes Preservation of Natural Objects and Taxidermy and Forestry).

The project application was submitted into Call 02\_16\_015 for ESF for universities in summer of 2016. In April 2017, the CULS was informed that the project had been approved by the MEYS whilst the funding was cut down to CZK 182 million; the FFWS share after the cuts will thus be CZK 12 million.

The second half of 2017 was marked by contemplating new programmes and preparing supporting documents related to the project and especially to the new requirements for institutional accreditation. Education of the FFWS academic staff also forms a part of the project. In 2017, the Faculty commenced teaching competencies courses (in collaboration with the Institute of Education and Communication) as well as a communication skills course.

Acquiring the necessary infrastructure for the re-accredited and newly established programmes is being solved on the FFWS part through the project plan of High-tech Technological-educational Pavilion of the FFWS.

#### **FFWS High-tech Technological-educational Pavilion (HTP)**

As soon as in 2016, a project application was submitted into the ERDF call for universities No. 02\_16\_016 OP RDE for a construction of a new High-tech Technological-educational Pavilion of the FFWS (in short: HTP) with the overall planned budget approx. CZK 240 million and the planned implementation period of 1 May 2017 – 31 October 2019.

The aim of the project is the construction of a new FFWS pavilion for collecting, processing and utilisation of natural and technical findings in education and practical use of digital data of geographic information systems. In the new facility a construction of a new educational laboratory is planned and a classroom using not only the devices for a remote exploration of Earth but also other high-tech SW and HW equipment will be acquired.

The building of the High-tech technological-educational pavilion of the FFWS is crucial for introducing two new study programmes in accordance with the demands of the real life environment (System Arboristics and Wooden Structures and Wood-based Constructions) and also of three newly re-accredited programmes (Wood-processing Engineering, Preservation of Natural Objects and Taxidermy, and Forestry). The newly built infrastructure will be used, in case of approval by the MEYS, secondarily also for the existing programmes, such as Wood Technology or Forest Engineering. The goal of the project is to secure favourable conditions for the sustainable ensuring of the up-to-date education process with direct links to the demands of employers and the study environment (modern facilities, collections and educational materials).

The evaluation process results were announced on 13 April 2017, and the project was approved by the MEYS whilst the budget was cut down to CZK 192 million. Immediately after the legal document was issued, the Faculty commenced taking steps leading to the selection of the main construction contractor. The selection procedure was published at the end of 2017 so that the construction work could be initiated in the spring of 2018. The project is being implemented in accordance with the planned time schedule.

#### **The newly emerging research and study programmes at the FFWS, Material Background for PO Study Programme, Material Background for GChF and DPZ Study Programmes**

At the beginning of September of 2016, three complementary projects were submitted in two calls of OP RED 02\_16\_018 Research Study Programmes Development and 02\_16\_017 Research Infrastructures for Educational Purposes – building or modernisation: Creating of the new research study programmes at the FFWS, Material Background for the PO Study Programme, Material Background for GChF and DPZ Study Programmes. All of the above named projects were approved in April 2017.

The set of projects will allow for creation of three accredited PhD study programmes and for acquiring the necessary infrastructure. In case they are evaluated positively, the new programmes will be preparing high quality experts capable of using up-to-date technologies in all individual research areas.

These are the following PhD programmes:

- Applied Geoinformatics and Long-distance Earth Exploration in Forestry,
- Forest, Wood and Wood-based Materials Fire Protection,
- Global Change Forestry.

It is intended to prepare the last named programme in the English language as a joint degree in cooperation with the project programme partner – the Technical University in Zvolen. The remaining two PhD programmes should be accredited in both, the Czech and English languages. The total planned budget for the three projects was originally CZK 28.7 million, when approved it was cut down to CZK 27 million. The time schedules of the said projects were planned for the period between 1 April 2017 and 30 September 2022. Immediately upon approval, preparations were commenced on all the three new study programmes and also debates with our colleagues at Technical University in Zvolen, Slovakia, began about the conditions of the future cooperation. Instrument purchase selection procedures were commenced at the end of 2017.

### **Forestry Higher Education Advancement in Laos (FORHEAL)**

In autumn, the FORHEAL project run under the ERASMUS+ programme was approved with its main objective to boost the university levels of education in Laos with the assistance of the best forestry universities from Europe. The project is implemented under the management of the Finnish University of Helsinki (Helsingin Yliopisto) with the participation of Alber-Ludwigs-Universität in Freiburg, Germany and the CULS Faculty of Forestry and Wood Sciences in Prague.

The particular objectives of the project are:

- To support three universities in Laos in the preparation or development of their Master's study programmes in forestry (the National University of Laos, the Savannakhet University, and the Souphanouvong University in Luang Prabang).
- To improve the employability of the graduates by adapting the curricula of the Laotian universities so they suit the respective national as well as regional needs through support of spreading information and raising of awareness of possible internships and work experience with the relevant employers, and through boosting the educational capacities of the academic staff.
- To support cooperation and exchange among all the three named universities with the purpose of raising the levels of quality and accessibility of education capacities in Laos.
- To strengthen the links and cooperation between university level institutions in Laos and Europe, including exchanges of academic staff and also other university employees.

The November kick-off meeting in Laos represented the key first step of the whole international team cooperation. At this meeting, we allocated the main tasks among ourselves, and at the same time we were introduced to the environment and levels of forestry education, including the demands from the real settings.

### **Projects submitted in 2017 – at the stage of evaluation**

Two projects – VODA and WAMOS – were submitted in June last year under Call No. 25 of Operational Programme Research, Development and Education aimed at support of pre-application research. In July, both the projects passed the scrutiny for formal conditions and acceptability conditions and were submitted to the next (material) round of evaluation. Unfortunately, at the beginning of 2018, we learned that neither of the projects was financially supported due to the lack of financial resources. We plan, however, to utilise the topics of these projects in one of the future grant opportunities.

### **Strengthening the research of forest management under global change (SHERMAN)**

In autumn, one project plan was submitted under the title SHERMAN within the call WIDESPREAD-AD-05-2017: Horizon 2020 (Twinning programme).

### **Transnational research cooperation in Bioeconomy Oriented forest Management (BOOM)**

At the end of the year, the FFWS submitted a project aimed at cooperation of five universities in the area of bio-economy under the call EFI 2018-2019 Network Fund. Besides the cooperation with the CULS FFWS, there are also planned coordinated activities with the following universities: the Swedish University of Agricultural Sciences (SLU), the University of Eastern Finland (UEF), BOKU University in Vienna, and ULisboa, Portugal.

### **The future of a forest-based bioeconomy in Central-Eastern and South-Eastern Europe (FORSCEE)**

The FFWS also engaged in preparations of the FORSCEE project under the same EFI call under the leadership of the Universität für Bodenkultur, Vienna (BOKU).

The FORSCEE project will be striving to activate the potential of Central, Eastern, and South-eastern Europe in terms of development towards the forestry sector bio-economy. At present, the said region is lagging behind in development of strategies in the forestry bio-economy and there is still shortage of linking between the political-managerial sphere with the research community. FORSCEE aims to overcome in both the stated aspects, i.e. to ensure

high level of political support in the areas of forestry sector bio-economy and to engage research networks in the given region in the planned activities.

Viennese BOKU is in charge of the project, planned to be run over 18 months, and, besides the Faculty of Forestry and Wood Sciences of CULS, other major universities or research institutions in Poland, Slovakia, Croatia, Bosnia and Herzegovina, Italy, and Finland will take part in its implementation.

**Tabulka č. 5:** Overview of Faculty and international projects in the process of solution in 2017

Title/Acronym	Registration No.	Implementation period	Budget	Source of co-financing	Project type
EXEMIT-K	CZ.02.1.01/0.0/0.0/15_003/0000433	12/2016 – 10/2022	246,016,958.53 CZK	OP RDE	S&R
EVA4.0	CZ.02.1.01/0.0/0.0/16_019/0000803	10/2017 – 09/2022	357,833,275.83 CZK	OP RDE	S&R
MOST	CZ.02.2.69/0.0/0.0/16_015/0002386	07/2017 – 12/2022	182,197,504.47 CZK, of which FFWS: 20,774,644.58 CZK	OP RDE	Educational
FFWS High-tech Technological-educational Pavilion (HTP)	CZ.02.2.67/0.0/0.0/16_016/0002471	07/2017 – 12/2019	195,417,003.97 CZK	OP RDE	Educational
Creating of the new research study programmes at the FFWS	CZ.02.2.69/0.0/0.0/16_018/0002714	04/2017 – 09/2022	2,995,447.94 CZK	OP RDE	Educational/S&R
SUSTREE	CE614	08/2016 – 07/2019	1,821,118.98 €, of which FFWS: 210,576.50 €	Interreg CENTRAL EUROPE	S&R
Silva Gabreta Monitoring – Cross-border Biodiversity and Water Regimes Monitoring Implementation	26	04/2016 – 03/2019	1,539,476.37 €, of which FFWS: 79,215.00 €	Cooperation between the Czech Republic and Bavaria	S&R
Cross-border Mapping of Forest Ecosystems – Path to the Common Management of the Šumava and the Bavarian Forest National Parks	99	01/2017 – 12/2019	735,576.00 €, of which FFWS: 74,900.00 €	Cooperation between the Czech Republic and Bavaria	S&R
FORHEAL	585884-EPP-1-2017-1-FI-EPP-KA2-CBHE-JP	10/2017 – 10/2020	998,752.00 €, of which FFWS: 136,079.00 €	ERASMUS+	Educational/S&R

**Explanatory notes:**

Operational Programme Research, Development and Education (OP RDE)

Cooperation of the Czech Republic and Bavaria Cross-border cooperation programme between the Czech Republic and the Free State of Bavaria Target (ETC Objective) 2014–2020

S&R

Scientific and research project

## 7 Financial and HR management

### 7.1 Financial management

As it has become almost a norm, the FFWS management and economic activities employ multiple sources. We have succeeded in increasing the budget in 2017 in the areas of the long-term conceptual development and institutional support. In 2017, the Faculty also administered new funds assigned under the Operational Programme Research, Development and Education, namely supporting two projects we have been granted under the calls "Excellent Teams" and "Excellent Research". In total, the FFWS obtained the sum of CZK 118,293,495 into its budget for 2017 within the framework of subsidies per student, the institutional support for the Long-term Conceptual Development (DKR), and specific research.

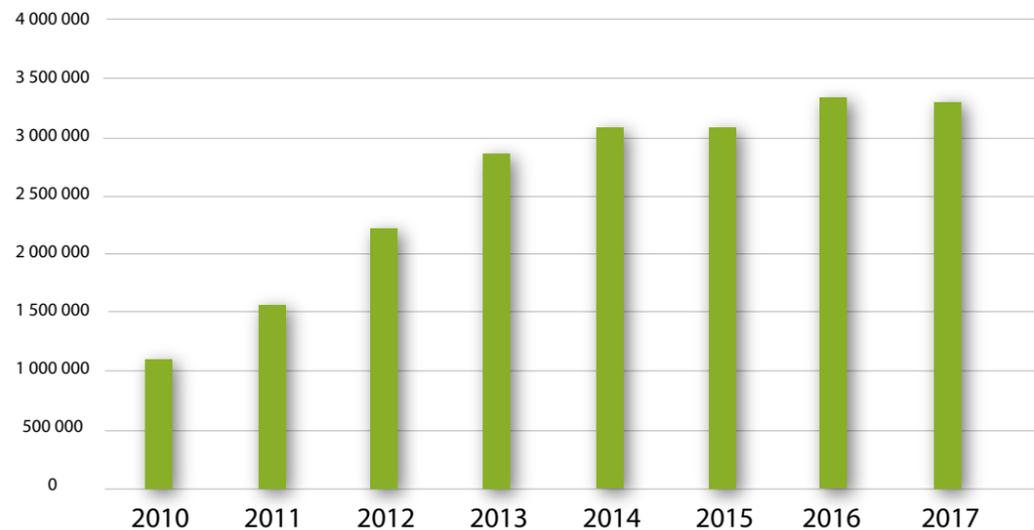
Within the framework of implementation of the project "Building up an excellent scientific team and its spatiotechnical background focused on mitigation of the impact of climatic changes to forests from the level of a gene to the level of a landscape at the FFWS CULS Prague", No. CZ.02.1.01/0.0/0.0/15\_003/0000433 financed by OP RDE, we have used non-investment funds in the amount of CZK 26,252,402.13, and investment funds in the amount of CZK 44,109,220.91.

Throughout 2017, the rules for handling the provided funds in accordance with Act No. 218/2000 Coll., on Budgetary Rules, as amended, were consistently and strictly kept in the area of financial management of the CULS FFWS in Prague. The Faculty as a whole adhered to the budget as planned and at the same time managed to have a budget surplus in its main operation – i.e. the operational funds – totalling CZK 16,505,491.84. The said sum was transferred into the Operational fund as at 31 December 2017. At the same time, a certain amount of funds from the Operational Fund was used in co-financing of investment activities of the Faculty, hence the overall economic activity surplus is obviously smaller. The DKR non-investment support was increased by CZK 683,267 for 2017.

**The Faculty funds (the Scholarship Fund, the Operational Fund, the Reward Fund, and the FRIM fund of capital goods development)**

The Scholarship Fund was created from the tuition fees. Likewise in the previous years, in 2017, the scholarships were awarded in accordance with the Scholarship Rules of the CULS. Currently, we are making every effort to keep the Fund at a constant level whilst investing the funds obtained throughout the calendar year back into our best and most talented students by the means of awarded scholarships. The development of the Fund between 2010 and 2017 is illustrated in the chart in Fig. 20 below.

**Fig. 20:** Scholarship Fund development between 2010 and 2017



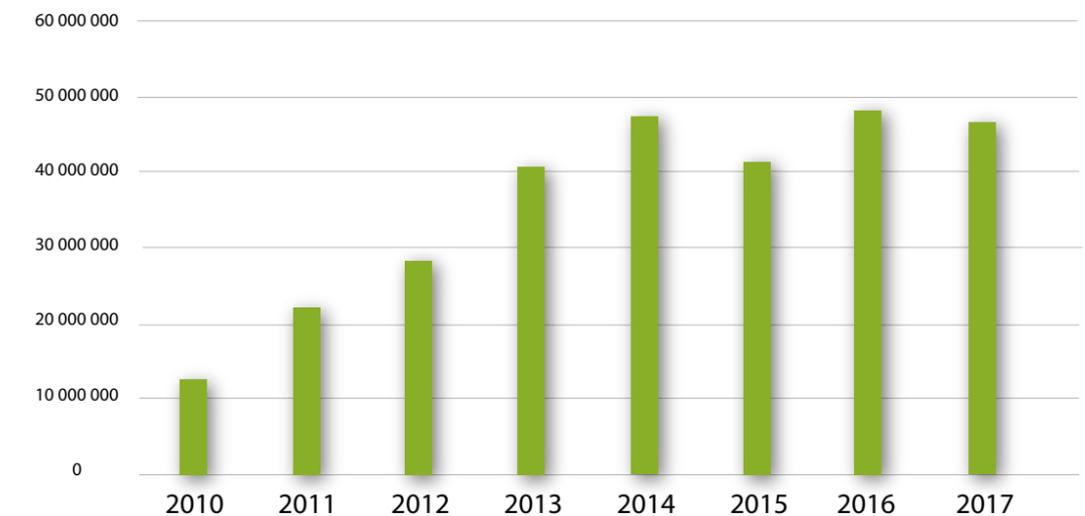
The Reward Fund is comprised of transfers of funds from the Operational Fund and it is used to cover the salary compensations (leaves, sick leaves) related to already completed projects (see Chart 6). The above stated costs are incurred by the projects every year, whereas in the continued projects they are covered from the project funds whilst in the case of projects in their final stages it is necessary to provide the missing resources in a most suitable way.

Bearing in mind that a considerable number of projects is being solved, the mandatory participation in co-financing has to be taken into consideration. From the FRIM fund of capital goods development there were funds drawn in this way for the partnerships in various projects in total of CZK 3.5 million (exchange of the FRIM fund for the CULS KaM

own income). Another part of the resources from this fund (CZK 5.891 million) was used as a direct grant into the FRIM fund for the purpose of acquiring the tangible fixed assets, namely the completion of equipping the FFWS Pavilion of Wood Sciences. Although the Pavilion of Wood Sciences was completed in 2015, some of the areas and equipment are still in process of optimisation, namely based on the needs defined by individual research teams, or pedagogues. Through these forms of investment, we are ensuring a better operation of the building and optimal utilisation of the funds from the Operational Programme Research and Development for Innovations.

The Operational Fund comprises of the balance transfers from the educational activities grant, that is, the surplus in the main operation. This Fund primarily serves for accumulation of funds designated for further use in the operational and investment development of the Faculty (see Fig. 21). With regard to the need of the Faculty to complete the construction of new premises necessary for further development, maintaining the level nearing CZK 50 million in this Fund is much needed. The Fund is of great importance also due to the planned expenses, linked namely with the modernisation of the Cultivation Station in Truba and completing the creation of the FFWS Arboretum in Kostelec nad Černými lesy.

**Fig. 21:** Operational Fund development between 2010 and 2017



The development and balance of the funds, as shown in Chart 6, is consistently positive. The total financial reserve of the Faculty as at 31 December 2017 was CZK 63,020,829

(FRIM, Operational Fund, Operational Fund after taxation, balances on donations from abroad).

The reserves in the Faculty funds were formed in 2017 also with regards to the mandatory co-financing of the planned projects under the Operational Programme Research, Development and Education, and international projects to be implemented in 2018–2022.

**Chart 6:** Faculty funds development

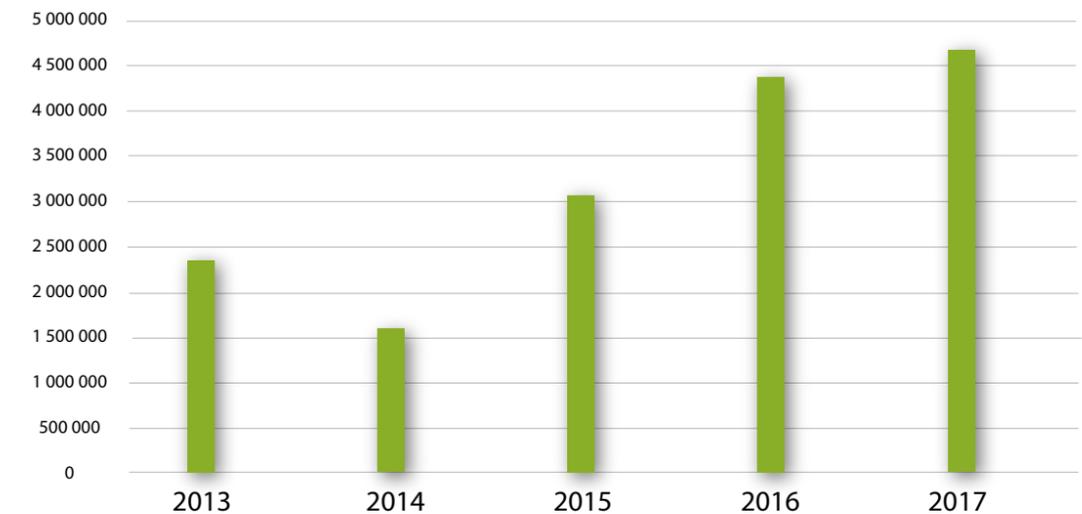
	Scholarship Fund	Reward Fund	Development Fund of Investment Property	Operational Fund	Operational Fund after taxation	Donations from abroad
Balance as at 1 Jan 2017	3,339,136	-6,180	102,260	48,081,320	569,951	2,650,432
Formation of the Fund	2,191,791	430,000	14,134,530	16,540,165	938,713	0
Fund withdrawals	2,229,457	413,647	5,254,587	17,955,265	98,334	0
Balance as at 31 Dec 2017	3,301,470	10,173	8,982,203	46,666,220	1,410,330	2,650,432

As traditionally the case, since 2014, the FFWS generated profit from complementary and own activities. The profit for 2017 in total of CZK 846,668.08 has been transferred into the Operational Fund after taxation. The profit deposited in the Fund will be used for pertinent covering of emergency and unexpected expenses. In 2017, also the funds from investment institutional support in the total amount of CZK 4,022,979.92 were used in acquiring the tangible fixed assets and technical improvement of immovable property. The specific research funds are a key source of funds for the Faculty doctoral students. The allocated funds are administered in accordance with the FFWS Grant Agency statutes implying the students contesting for the funds for their research in open grant competitions. The Faculty transfers part of the funds to the Rector’s Office where they become a prize in the grant competition administered by the university-wide CULS Grant Agency. In 2017, the students obtained CZK 5.2 million (Fig. 22, Chart 7) for support of their projects through IGA, and further CZK 4.7 million from the CULS Grant Agency (Fig. 23). Part of the funds assigned within the framework of specified research is used for organising student conferences and administrative support of the S&R Department.

**Chart 7:** Development of subsidies for the specific research and IGA

Specific research	2013	2014	2015	2016	2017
Subsidies	4,139,555	4,144,734	4,317,731	5,552,174	5,810,511
IGA	3,882,763	3,632,792	3,912,102	5,077,788	5,148,113

**Fig. 22:** Development of the funds acquired under CIGA



The Faculty obtains yet another part of its financial funds through cooperation with the commercial sphere. Although we did not accomplish to obtain amounts as high as in 2016, the funds streaming from contractual research projects, and complementary activities performed by the Faculty had positive impact on the overall balance and financial management in 2017.

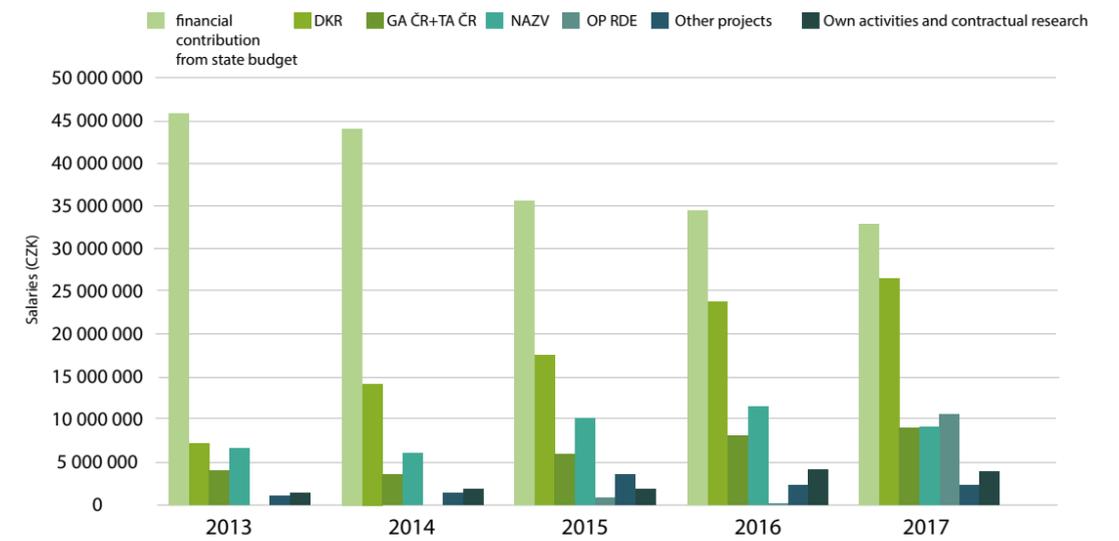
**Chart 8:** Development of income/profit from contractual research and complementary activities

	2013	2014	2015	2016	2017
Complementary activities income in total	2,284,012.56	2,446,952.72	3,219,821.30	5,396,671.65	3,818,276.94
Profit after taxes	368.46	245,864.64	339,573.22	571,499.58	643,562.94

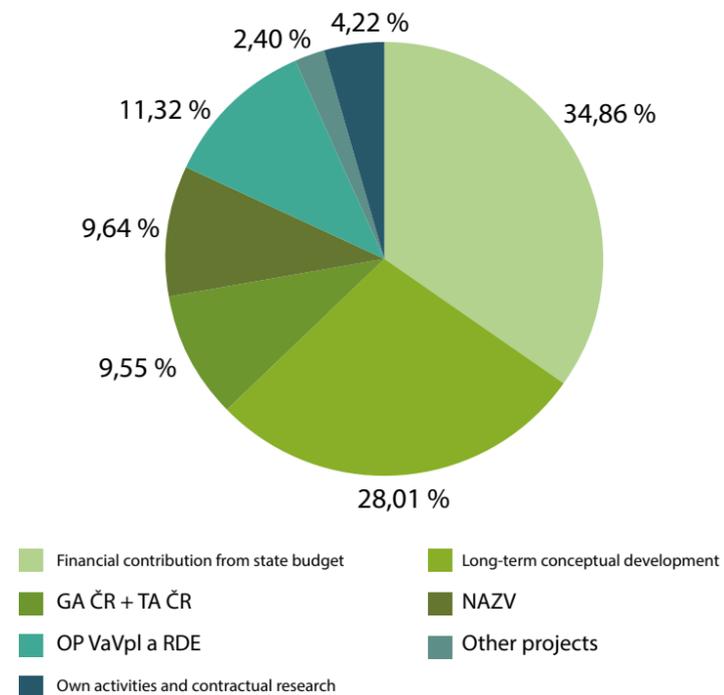
From the new Faculty leadership coming into office at the end of 2011, we have been making every effort to significantly diversify the financing schemes for the Faculty. Thanks to this approach, we have been increasing the stability of the Faculty and its staff which is, regarded from the HR development point of view, a very important issue. Through this approach, the structure of funds designated for the staff salaries and rewards has been transformed significantly. Only in 2013, the share of salaries paid from the “per (student) capita” funding from the state budget was 69.16%; compared to that, in 2017, it was only 34.86% (Fig. 23). The remaining part of the funds comprises of subsidies for scientific and research activities of the FFWS (DKR), the funds of grant agencies, funds provided from own activities (co-participation included) and from contractual research projects. In 2017, a new significant increase of salary funds for the FFWS took place through the OP RDE subsidies. Presently, such approach ensures a stable environment for several years ahead. Our endeavour is to achieve not only stability but also prevalent financing from the funds of scientific research projects and from the scientific results subsidies. Considering the prevalent share of financing of the salaries being covered from the science and research funds, we have been able to state for several years in a row that the FFWS represents unequivocally a scientific and research faculty.

Detailed salaries financing structure is shown in the following figure (Fig. 24). It is evident that the largest segment also in 2017 was formed by the “per capita” funding – approximately one third of all salaries. Gradually, the contribution provided by the NAZV was decreasing, whilst TA CR and GA CR agencies are securing increasingly greater parts of salary sources. We are anticipating that in the coming years the significance of the operational programmes will grow considerably, and we perceive such programmes as investments into future where, through excellent S&R results, the Faculty will create conditions for better institutional financing.

**Fig. 23:** Salaries financing structure at the Faculty in 2013–2017



**Fig. 24:** Salaries financing structure at the FFWS in 2017



**Notes:**

Other projects – COST, Norwegian funds, Erasmus, Interreg

Own activities and contractual research – include also participation from non-public sources

## 7.2 FFWS organisational structure

The FFWS management pays a constant attention to the area of human resources. The year 2017 saw continuation of the pursuit of the strategic objectives in accordance with the Strategic Plans of both, the FFWS as well as the CULS, in the area of enhancement of professional skills and qualifications through the habilitation and professorial proceedings compliant with the new regulations of the Faculty which came into effect in 2017. Two staff members were habilitated in 2017 at the Faculty, whilst some associate professors left (Charts 10 and 11). We could say that throughout the whole year 2017 we were experiencing turbulent times in terms of human resources as being granted large projects from OPs brings about the need for changes in the settings of staff positions. The changes in academic posts, especially the drops in numbers of calculated work loads of professors and associate professors, were caused by their participation in operational programmes, whereas on the other hand, the rise in numbers of researchers and scientists stems from accepting new as well as some current staff members into positions in operational programmes.

The structure of the Faculty in terms of qualifications, expressed by the ratio of the number of professors and associate professors to the number of senior assistants and assistants in 2017 was 50% : 50% (Chart 10). The goal set in the previous years – that is reaching the 45% share of professors and associate professors in the overall conventional academic headcount – is being consistently achieved. We have been successful in acquiring also experts from abroad with the credentials of professors and associate professors for our new projects. Their acceptance, however, is not easy within the rules framework in the Czech Republic therefore as a matter of principle we only state the numbers of professors and associate professors whose titles have been recognised. For that very reason they are not listed even as senior assistants or assistants in Chart 10.

The share of the FFWS foreign employee numbers is constantly mildly increasing. The calculated proportion of work load of academic staff of other nationalities than Czech comes to 19.9% out of the overall academic staff work load. Employing specialists from abroad, especially in case of outstanding experts, is in full harmony with an increase in quality trends in education and research as well as it is in connection with the increasing numbers of foreign students.

**Chart 9:** Development in the number of academic staff members of the FFWS and their age structure over the last six years

Category	as at 31/12/2012		as at 31/12/2013		as at 31/12/2014		as at 31/12/2015		as at 31/12/2016		as at 31/12/2017	
	Number	Average age										
Professors	10	61	12	61	12	61	13	58	16	57,6	15	59,7
Associate professors	22	49	21	46	19	48	18	49,5	20	47,3	20	46,5
Senior assistants + Scientists	67	41	78	41	75	39	51	37	92	42,5	100	45,5

**Chart 10:** Development in the number of the FFWS staff members in the last six years – ratios

Year	Professors	Associate Professors	Senior Assistants	Assistants	Scientists + lectures	Technical-economic staff*	Total
2012	8.7	20.6	30.4	0.0	16.7	31.2	107.6
2013	10.8	19.5	37.1	1.6	20.8	31.7	121.4
2014	10.5	18.4	41.9	1.2	20.8	34.5	127.2
2015	11.5	17.4	41.7	1.2	19.8	31.8	123.3
2016	12.5	19.0	31.1	0.5	40.2	30.3	133.6
2017	10.1	16.0	25.5	0.7	52.0	27.0	131.3

\*Technical-economic department staff members (part of these staff members participate in direct S&R support not only through data collection but also by their own publishing activities)

OA (SA) – senior assistants; A – assistants; VP (S) – scientists; L – lecturers

**Chart 11:** Development in the number of the FFWS staff members over the last six years – registered records

Year	Professors	Associate Professors	Senior Assistants	Assistants	Scientists	Technical-economic staff*	Total
2012	10	22	37		30	43	142
2013	12	21	44	1	34	45	157
2014	12	19	48	1	26	52	158
2015	13	18	48	2	39	37	157
2016	16	20	43	2	47	35	163
2017	15	20	39	1	61	27	163

\* Technical-economic department staff members (part of these staff members participate in direct R&D support not only through data collection but also by their own publishing activities)



**Marketing  
Department**

**8**

## 8 FFWS Marketing Department

### 8.1 The Marketing Department as a part of strategic planning of Faculty development

Marketing has already become an inseparable part of the Faculty strategies. In the past year, the Marketing Department marked again growing efficiency in spreading the information about the Faculty and its projects to professional and general public.

It was linking the individual parts of the Faculty and creating a complex awareness of the Faculty in the outside world. In order to make the study opportunities and Faculty activities more visible, electronic environment was mostly chosen as it is more attractive and user-friendly for the potential students and young people in general. The support of recruiting new applicants for studies represents one of the Marketing Department's key activities every year. The targeted promotion events run in social networks used by the Faculty (Facebook, Instagram, Twitter) and on the Faculty web site were very successful. Much greater emphasis was placed especially on emailing in 2017 as a substantial source of information for those interested in studies at our Faculty. Personal contact with the applicants at the CULS Open Days and during the promotion events at high schools played an important role as well.

The Department also ensured the promotion of the Faculty at large events. On one hand, the Faculty took part in professional exhibitions and fairs such as Natura Viva, Wood-Tec, Dřevostavby (Wooden structures), etc. On the other hand, it focused its attention on holding exhibitions intended for those aspiring to study which are frequented by large numbers of people and where there is a great potential in opportunities to address high school students. Every year, the Faculty is visited by many undecided high school students but also by already decided students who through personal communication acquire advice and information about their future studies.

The Marketing Department engaged actively in the Forest Pedagogy events and the YPEF competition. Through the Forest Pedagogy it has been bringing forestry, wood technology, and game management in entertaining and interactive ways nearer to children at early age and also to their parents thus helping them in creating a positive attitude and relationship to nature.

As traditionally, the Department was cooperating with student bodies (FFWS Buglers, Hunting Club of the CULS FFWS in Prague, Student Club of the CULS FFWS, student editorial board of Popularizace vědy – Science Promotion) and also participated in the editorial board of the

CULS Bulletin "Živá univerzita" (Living University), mapping the life of the entire University.

The aim of any and all public as well as internal activities of the Marketing Department is strengthening of relationships between the staff members and doctoral students, deepening the cooperation with the Faculty partners, external companies and graduates, and attracting attention of the current and also future students.

The Marketing Department lives for the good reputation of the Faculty.

## 8.2 Events aimed at student recruitment

### Open Days

Those interested in studying at the CULS had the opportunity to visit the Faculty premises, obtain information regarding the study programmes and to chat with the current students. The Open Days series at the CULS took place in January 2017, and single-day Open Days were held in March and November.

### Prague Public Universities Fair

The presentation of the Faculty branches and courses took place in the second year of the Prague Public Universities Fair held at the Carolinum Hall of the Charles University at Ovocný trh in Prague.

### Gaudeamus Prague, Nitra, and Brno

The Faculty participated in the Central European Education and Lifelong Learning Fairs Gaudeamus both, in the Czech Republic as well as in Slovakia.

### "Kam na vysokú" ("Which Uni to Choose?") – Trnava, Prešov, Žilina, Banská Bystrica, Košice, and Trenčín

We sent our student delegates to the Slovak fair of post-A-levels education which was organised in five towns. Despite the fact that the fair has regularly had positive responses each year, the number of students enrolled into the studies at our Faculty still remains low.

Two more recruitment events took place in Slovakia:

Academy & VAPAC Bratislava, where the Faculty representatives presented the study programmes and provided detailed information to those interested in studies at the Faculty.

The FFWS took part in Pro Educo Košice in order to provide information to the potential applicants from Slovakia.

## 8.3 Promotional events

### Bread Basket

The Faculty participated in the XLIV annual Agricultural Fair, the renowned Bread Basket. Besides information regarding the study programmes and courses and games for children, the Faculty also presented in its stand samples of music played at hunts.

### Paths of Wood

The second season of FOR WOOD trade fair held at PVA EXPO Letňany in Prague, together with concurrently run FOR PASIV fair, was visited by more than 21,000 attendees. As in the last year, the fair was held under the Faculty's auspices. It was exhibiting its wooden stall where also the individual departments were presenting their activities and achievements.

### Dřevostavby

Wood-processing departments – the Department of Wood Processing and the Department of Wood Products and Wood Constructions presented themselves at the Výstaviště Prague Holešovice exhibition ground. This fair was crucial for establishing relationships with new institutions and companies. Interest was marked from the potential applicants for study of the Wood Technology and Business in the Wood Processing and Furniture Industry courses. Interactive wooden objects were used at this fair by the kind courtesy of an artist and designer Martin Patříčný.

### Festival vědy

The Faculty again participated in the Science Fair held as usual at Vítězné Square in Prague-Dejvice. In an entertaining interactive way the Faculty provided children and also the other visitors to the Fair with information from the areas of forestry and game management. Live animals, such as tropical grasshoppers or phasmatodea, served as an attraction or curiosity.

### Hunting and Fishing Festival

Second season of festival dedicated to the demonstrations of game management activities and fish harvesting took place in Rožmitál pod Třemšínem again, held by our partner company – Kaiser s.r.o. – lesnicko-dřevařská výroba (forestry and wood processing). The Faculty was yet again one of the main contributors to the programme with the stall presenting the forest pedagogy thanks to which the stand was a frequent stop for families with children.

**A day with Lesy ČR**

The Faculty again participated in the event held for the general public at the Konopiště Castle.

**Forestry & Hunting Festival at the Křivoklát Castle**

The 3rd year of the St. Eustace Festival took place at the Křivoklát Castle again with the Faculty buglers present and the Faculty stand with the forestry & hunting exhibits on display.

**Open Days at Arboretum in Kostelec**

The gates of the Faculty Arboretum opened once again to the general public during the spring and autumn Open Days. The event is attended by several hundreds of members of both, the professional and mainly the general public.

**WoodTec**

Wood Technology departments took part in the biannually held international fair of wood-processing and furniture industry. They drew on the opportunity by establishing new contacts and building of cooperative relationships. Two representatives of the Faculty contributed to the accompanying programme.

**8.4 Student competitions and events held at the CULS****Young People in European Forests – YPEF**

The regional round of knowledge competition YPEF for Prague and Central Bohemian Region was run at the FFWS. The competition was run in two categories – junior and senior students. In total, 39 three-member teams came to the regional round to compete and take a written test and a wildlife recognition quiz. The attendance rose by 50% compared with 2016. The winner teams qualified for the national round that has been organised by the Faculty for a number of years.

The 7th annual national finals of this competition were held at the castle and Faculty Arboretum in Kostelec nad Černými lesy in June. Following the local and regional rounds 12 three-member teams fought their way through into the finals. Following a big fight, the absolute winner prize was awarded to the team of the Czech Academy of Forestry in Trutnov. The same team represented the Czech Republic at the international finals in Hungary in September.

**Life Science Film Festival**

The 8th year of the international festival of documentary films with the topic of natural and

agricultural sciences was outstanding for the Faculty. Among the films shown at the festival there was also “Svět podle termitů” (The World According to Termites) which was co-produced by the Czech Television and the Czech University of Life Sciences in Prague (and especially with a significant inspirational and financial assistance provided by the FFWS). One of the key persons in the whole project was doc. Mgr. Jan Šobotník, Ph.D., a scientist who is a member of our Faculty and who initiated the filming project in the first place. “The World According to Termites” was very successful and broke through by winning the Grand Prix of LSFF.

**The CULS Garden Party**

The Faculty took a large part in this whole-university held event joining the individual faculties' graduates. The event attracted not only the said graduates but also the current undergraduate students who came to spend pleasant moments with live music.

**The Summer Children's University**

The first season of a week-long event was run under our Faculty's auspices with the topic “Forest and Game Management”. Children had the opportunity to get acquainted with the environment of the forest and with the attractions in the areas of forestry and game management in entertaining and interactive ways.

**CULS Rector's Cup Shooting Competition**

15th annual shooting competition under the auspices of the CULS Rector took place, as has become the tradition, at Chloumek near Mělník. The Marketing Department organised the competition in cooperation with the student Hunting Club of FFWS CULS in Prague.

**FFWS Dean's Cup Shooting Competition with small-bore rifle K4M**

Under the auspices of the Dean of the FFWS, the Hunting Club of the FFWS CULS in Prague organised already the 10th annual shooting competition with a small bore rifle at the Magnum Prague – Sedlec shooting range.

**8.5 In-house Faculty events****Gala opening of the EXTEMIT-K laboratories**

The EXTEMIT-K project laboratories, as one of the most significant Faculty projects, were opened in the presence of the Rector, the leadership bodies of the University and Faculties, and Advisory Board members. Those invited were presented with the first-rate laboratory equip-

ment, the research facilities as well as the offices intended for the scientists and doctoral students working in the laboratories.

### **Summer gathering at the Arboretum**

The summer get-together of the Faculty partners, staff, and PhD students was as usual organised at the end of June on the beautiful grounds of the FFWS Arboretum in Kostelec nad Černými lesy.

### **Sales event**

Before Christmas, the students and staff members of the CULS had an opportunity to purchase outdoor equipment at affordable prices at the Faculty.

### **Announcement of the winner of competition for the new FFWS fair stall**

In 2017, the FFWS announced it would hold a student competition for the new FFWS fair stall in cooperation with the Wood for Life foundation. The gala announcement of the competition winner took place in the presence of the Dean prof. Turčáni and the Foundation Director Ing. Polák. The winner – Bc. Helena Vostalová – was awarded a financial prize and was assured the stall would be produced following her design.

### **The FFWS Christmas concert**

The pre-Christmas season was marked by the FFWS Christmas Concert again; the programme was hosted by the Faculty staff and students. The invited guests enjoyed the tones of organ music, choir compositions, and the trumpet sounds. A handover of a painting purchased from the DUHA Association whose motif was used in the Faculty issued New Year Cards under the project New Year Cards that Help has become a tradition of the season as well.

### **Christmas party at the FFWS**

Before Christmas, the Únětice Brewery provided us again with the facilities for the seasonal get-together of staff and doctoral students. They could spend a lovely time in a very pleasant environment, have nice friendly chats, and at the end wish each other a very merry Christmas.



Departments

9

## 9 Departments

### 9.1 Arboretum

The FFWS Arboretum lived through another successful year in all of its activities for which it has been receiving a great financial and moral support from the CULS FFWS and the Rector's Office. Without such support in 2017, the Arboretum could not serve as the FFWS base for scientific work and practical training in the field of dendrology for the CULS FFWS students but also for students of several other CULS faculties. The students visited the FFWS Arboretum within the framework of several field trips of other subjects lectured at the CULS; furthermore, the students of the Faculty of Civil Engineering of the Czech Technical University spent part of their field trip in the Arboretum as well. Manual, hands-on training for first year undergraduate students of Forestry forms an inseparable part of the spring and autumn schedules for student activities. Many thanks are due to these students as through their diligent work and efforts they have helped in refurbishments of individual sections in the "old" part of the Arboretum as well as in all of the Arboretum grounds. It is appropriate and right to also express gratitude to the students as well as the staff of the Department of Game Management and Wildlife Biology, the Department of Silviculture, and the Department of Wood Processing. Some of the results of scientific measuring performed at these departments come from research equipment and areas located on the grounds of the FFWS Arboretum. The research equipment in the form of magnetic coil, thermochamber, and areas designated for experiments with forest woody plants are placed at the facility base in Truba station. Within the framework of long-term cooperation, the Arboretum is in partnership with the University Forest Enterprise in Kostelec nad Černými lesy and with a professional firm that holds courses in tree-surgery and climbing in the FFWS Arboretum also for the Faculty staff members, and helps with tending the woody plants growing in the Arboretum.

On a long-term basis, in the last week in May and in the first week in October, Open Days events are held for the general public. Several hundreds of regular as well as new visitors paid visit to the Arboretum, even in unfavourable weather conditions. The atmosphere and the expert led excursions with factual as well as amusing content were a great success with the public as well as with people from the professional circles who visited the Arboretum. Practically throughout the whole year visits of kindergarten, elementary, and secondary school groups as well as the U3A groups take place in the FFWS Arboretum. The Arboretum was visited by a few groups of children from biology clubs and by members of the Czech Tourist Club. As for the visitors from abroad, the Arboretum was visited by the Warsaw University students within the programme of the summer school

of "Silviculture in Central Europe", students from the International Forestry Students' Association, and students of the Belgian Bernardus Technicum vocational school from the town of Oudenaarde, which is a long-standing partner of the University Forest Enterprise in Kostelec nad Černými lesy. The students of NCSU (Raleigh, North Carolina) and Purdue (Lafayette, Indiana), together with their Swedish counterparts from SLU (Uppsala, Sweden) paid a visit to our Arboretum as a part of an extensive European field trip parts of which also take place, among others, in Sweden, Poland, and Germany. With the accompaniment of professors Šišák and Podrázský our lady colleagues from the Kazakhstan universities also visited the Arboretum; whilst yet another important visit was paid by the members of the International Oak Society. Also in the FFWS Arboretum, the practical part and the announcement of the national round winners of the international competition for the elementary and secondary school students YPEF – Young People in European Forests – took place. On 1 June 2017, still another event, jointly held also at the Truba Cultivation Station, was the demonstration of the detection of spruce trees infested with the bark beetle with the use of dogs. Several Czech TV stations and more than ten journalists were present at this event.

The Arboretum serves as the source of natural products for educational purposes as well. Many thanks rightfully belong also to the FFWS Arboretum staff who expanded the collections of the products of nature designated for testing and educational purposes not only with the leaves of woody plants but also with cones, fruits and annual shoots including the introduction of a new labelling system. A great amount of very rare and precious seeds of various woody plants with a precise locality description was successfully obtained through Index Seminum and from trips to Japan, and the plants are being further grown successfully. In 2017, the staff members participated in preparations of several wedding ceremonies on the Arboretum premises. Besides the work serving the promoting events of the station, the care for woody ornamentals and their subsequent sales, and a successful running of the department, the hands of our staff handled 3,300 kilos of tree cones in the last year during the processing of seed stock gaining thus almost 60 kg of seeds. In 2017, the germination capacity of the specimen of Scots pine (*Pinus sylvestris*) was 93.44%; 8.49 million seedlings grew from the processed quantity of seeds. A novelty in the Arboretum was the introduction of bee hives with the purpose of woody plants pollination and production of honey. The FFWS Arboretum regularly informs of all its activities and events on its Facebook profile with a high visitor count. Considering other development plans, in 2017 an exchange of land allotments took place between the town of Kostelec nad Černými lesy and the CULS. Currently more than 98% of the FFWS Arboretum area is located on the land that is in the CULS ownership. By creating an unbroken area of land in the sole ownership of the CULS there is a precondition established for further expansion of the Arboretum with the aim to include also floodplains, and small pond biotopes into the complex providing of more material for research-pedagogical purposes.

## 9.2 Department of Wood Products and Wood Constructions

In 2017, the Department of Wood Products and Wood Constructions followed the existing activities covering the education process at all three levels of education system, re-research projects, commercial contracts, as well as publishing activities. Since January 2017, solving of three R&D projects funded by TA CR has been in progress, also three projects aiming at commercial application of the R&D results funded from the OP GPCR, and two projects within the framework of a specific research of the MEYS were tackled.

The following companies are the main commercial partners in the stated projects: RD Rýmařov s.r.o., Matrix, a.s., Dyas.EU, a.s., Danzer Bohemia-Dýhářna, s.r.o., Kronospan CR spol. s r.o., Stachema CZ s.r.o., VVUD, s.p., and many other wood processing and wooden structures construction companies of various sizes.

The Department works systematically at the development of the wooden structures and buildings using wood as the main construction material, and has been successful at widening of the cooperation with teams and University departments across the forestry and basic wood processing branches of study.

The areas of education and development linked with the construction, timber and carpentry/joinery products, wooden structures and constructions, surface working, and composite materials based on wood remain the priorities of interest. The gradual increase in the interest of the commercial sphere in the contractual research and development cooperation with the use of know-how and technical background which are at the Department's disposal can be considered as a positive aspect. The contractual research orders placed by Kronospan ČR can be considered as the most significant ones. Small and medium-sized companies also show growing interest in creating long-term cooperation with the Department of Wood Products and Wood Constructions, and with the students of wooden processing branches of study as well.

The Department is substantially involved in creating of innovated study programmes in areas of wood processing technologies as well as of the study programme Wooden Structures and Wood-based Constructions for the academic year 2019–2020.

### 9.3 Department of Forest Ecology

The DFE secured a large portion of the lecturing and educational activities not only at the Prague venue, but also in Kostelec nad Černými lesy (FFWS Arboretum). Besides the core study branches at the FFWS, the pedagogues lead specialised courses for the students of other faculties (FES, FTAS). The Department staff continued in improving the quality of the instructional materials. External lecturers are often engaged in the direct educational process during the field trips – experts in the areas of forest typology who are able to relay the current trends of the typology classification development in the Czech Republic. The Department staff frequently take part in organising the so to speak traditional and well established student competition for the elementary and secondary schools students Young People in European Forests (YPEF) whose individual rounds are held at the campus in Prague-Suchdol and in the FFWS Arboretum.

The Department also ensures the methodological administration of the wooden plants specimen collection in the FFWS Arboretum in Kostelec nad Černými lesy; the collection was enriched last year with new and less known species with their exact location of origin (specimen were picked up by the Department organised expeditions). Thus the original concept of the collection is materialising – to give priority to growing wooden plants with a stated origin. Consulting, public awareness raising, and organising of excursions and field trips for interest and educational establishments represent an integral part of the Department's activity portfolio.

The Department members take part in the activities requiring expert opinion in dendrology. Two members of DFE represent the CULS in the expert council of the Czech Union for Nature Conservation (ČSOP) – Czech Certified Arborist.

In the area of research the staff members and the students secured the work on the GA CR projects in whose frameworks the field work operations in terrains of the whole of Central Europe are carried out. The Department co-acquired a new project under which the scientists from the Department will research and cooperate with the researchers from Russia and Japan. The PhD students participate in the CIGA projects with positive results. The acquired projects will aid in developing new areas of forest ecology studies in the future. A number of the Department members was awarded the "Rector's awards for the best publishing outputs and research projects" in 2017. Last year, 40 articles with IF were published by staff members of the Department. Most of those articles were published in prestigious journals such as Forest Ecology and Management, which are included in the 1st quartile on the Web of Science. Publishing of articles in magazines like, for instance,

Global Change Biology (IF 8.5) and Nature Climate Change (IF 19.3) can be rightfully considered as a distinct success is.

The Department staff members were, among other activities, instrumental in science popularisation through the preparation of two large format narrative books published by the Management of the National Park Šumava (Jan Dvořák: Pralesy Šumavy a 25 let příběhů Národního parku Šumava – "Primeval Forests of Šumava and 25 years of National Park Šumava Tales").

The Department continued in laboratories renovations and refurbishments – thanks to moving, the dendrochronology laboratory could be extended considerably. The capacity of the measuring tables was increased, and the Olympus SZX7 stereomicroscope with the overall 4x–336x magnification was added to the laboratory equipment. A fundamental change took place in the specimen processing when a broad- and narrowband belt sanders were included thus improving the readability of annual rings and reducing the time required for processing the drill samples from the time of transport from the terrain to the measuring. Moreover, the IT technologies are thus protected from the dust particles. The laboratory processes keep improving and developing in the direction of data quality and reducing the time for gaining of such data.

A wide range of people (not only from the Czech Republic but also from the whole of Europe) interested in our research and scientific work and events organised by the Department frequently visit our Department's social networks. Such events include film projections, recruitments of students for the field trips, educational trips and excursions, etc. An example of our educational activities could be the projection of a documentary *Ne-smrtelný les* (Immortal Forest) directed by Erik Baláž. Ecologist Karol Kaliský, a co-author of the film, participated in the event, later on involved in a panel debate with more than sixty participants. We make every effort to keep our supporters, who are currently numbering over 1,600 people, posted at least twice a week by notifications regarding the mentioned topics. The response is significant and overall very positive. Many followers turn to us with questions to which our Facebook profile administrators try to respond in the shortest possible time.

### 9.4 Department of Forestry and Wood Economics

In 2017, the Department of Forestry and Wood Economics (DFWE) secured lecturing in social sciences, namely subjects concerning economics, forestry and wood technology, and renewable natural resources with an emphasis on forest, not only in the FFWS study

programmes but also in teaching programmes run at the Faculty of Environmental Sciences (FES) and the Faculty of Agrobiological Sciences (FAFNR).

As part of its scientific and research activities, the DFWE was administering the NAZV project titled "The current and strategic possibilities of sustainable providing of forest functions and services of the polyfunctional forest management to the public from the socio-economical, political and legal standpoints in the Czech Republic" together with its partner organisations – Forestry and Game Management Research Institute Strnady and FFWT MENDELU in Brno. The third year of implementation was successfully completed in 2017. Besides that, the Department staff members cooperated in solving the socio-economic aspects of a range of other NAZV projects with other departments of the Faculty (e.g. DOS, DFPE, DFTC).

Under the international COST programme and the project "Orchestrating forest-related policy analysis in Europe", the MEYS project "Analysis of the national forest policies in the Czech Republic as a tool for preparing, formulating, and implementing of the European forest policy" was successfully completed in 2017.

In the area of contractual research, two projects were implemented and completed for the Grant Service of LČR, namely "Socio-economical Impacts of Potential Declaration of A 'National Park' Regime in the Křivoklátsko Region", and "Assessment of Forest Functions in Birch Vegetation, Economy of Birch Growing, and Proposal of the Solutions to Management of Birch Growth in the Czech Republic".

For the purposes of the Ministry of Agriculture of the Czech Republic, a document with the title "Methodology of Assessment of Selected Environmental Forest Operations Implemented under measure M08 – Investments into the Forest Areas and Viability Improvement of the Rural Development Forests under the Rural Development Programme in Accordance with the Certified 2010 Methodology" was drawn up, and for the Ministry of Agriculture of Croatia through the Faculty of Forestry of the University of Zagreb under the project "Establishing added value and sustainable use of secondary forest products", methodology procedures in obtaining and processing of information on collection of non-wood forest products were processed.

The engagement of Department staff in applied sciences was rather significant in their involvement in working groups of LČR s.p., in cooperation with VLS, s.p. and other entities. The Department staff actively participated in organising both domestic and international meetings, conferences, seminars, and symposia in 2017. Among the most important ones, we can mention, for example, the participation at the IUFRO 125th Anniversary Congress 2017 in Freiburg. Important domestic activities of the Department include, for

instance, holding of the international conference Woodema "More Wood, Better Management, Increasing Effectiveness: Starting points and Perspective" on the premises of the CULS FFWS in May 2017. We can add not only organising of two meetings of the Economic Commission of the Department of Forestry of the Czech Academy of Agricultural Sciences in Strážnice and in Liberec, but also – within the framework of the Czech Forestry Society – participation in holding "XXth Assembly of Foresters – 25 years from the transformation and establishment of the State Enterprise Forests of the Czech Republic", and of the seminar "State and Perspectives of Recreational Services of Owners and Managers of Forests in the Czech Republic".

## 9.5 Department of Genetics and Physiology of Forest Trees

The Department continued in fulfilling important tasks in the areas of research and development. Extended lectures of genetics were included in the Operation and Game Management branch, and the textbook on Physiology of Forest Trees was completed, whilst the work began on a new textbook titled the Genetics of Forest Trees. The number of the doctoral students at the Department was nearing the optimum level; the postgraduate students' engagement in the Department research and application activities can be classified as excellent too.

### Physiology of forest trees

In 2017, the physiological section of the Department was dedicated to fulfilling the long-term goals which include publishing of the results in relevant prestigious journals and at significant conferences as well as to deepening of interdisciplinary cooperation. After two years from the collection and processing of data in the French National Institute for Agricultural Research in Bordeaux in 2015, Ms. Ivana Tomášková was able to publish a methodology article dealing with the issue of selected woody plants vessels resilience to embolism in the prestigious journal *New Phytologist*. At a conference held in the USA focused on the measuring of the transpiration rates, the results of measurements taken in the mountain range of Krušné hory were presented in the form of a lecture. This research also presents the cooperation with the practice and applied science as it forms a part of a project assigned by LČR, s.p. that deals with the issue of new fungal pathogens in the given geographical region. Cooperation was established also with the Institute of Experimental Botany of the Academy of Science of the Czech Republic (IEB AS CR) through which the research aimed at phytoremediation is performed. An experiment commen-

ced in the IEB AS glasshouses the aim of which is to verify the impact of selected heavy metals on the biomass increase in beech trees. The basic physiological measurements were performed by the undergraduate students of Bachelor's and Master's branches of the Department. The major part of the year was dedicated to the preparation for purchases of new instruments under the EXTEMIT-K project in which a great number of devices will be used for measuring the common physiological parameters of spruce. At the end of 2017, another of the trips to the French Research Institute took place under the ERASMUS programme the output of which is a manuscript containing results of the physiological measurements on mango plants in tropical conditions. Furthermore, another stage of the international project Interreg implementation took place with the assistance of other sections of DGPFT.

### **Population genetics and genomics**

Final stages of a joint department research of heritability of photosynthetic parameters in Scots pine, in which many other Czech as well as foreign experts (Faculty of Science of Charles University in Prague, NCSU USA) took part. The output from this research was awarded with the Prize of the Minister of Agriculture (J. Čepl). Presently, a study of the reflectance of pine is still under way.

As part of the group activities the work continued in performing analyses of the expressions of dehydrin genes in Norway spruce ecotype; the first stage of the research is just before completion. Analysis of the Norway spruce ecotypes genomic SNP data and SSRs markers continued under the Faculty project EXTEMIT-K. One of the Master's degree students (Ms. Z. Bínová) was awarded with the Hlávka Foundation Prize for the study of genetic structure of Norway spruce ecotypes on microsatellite data. The long-term research activities of the Department (SFTIC Florida, USA) as well as the individual sections (IUFRO Seed Orchard Conference, Sweden) were presented in the form of a lecture at international conferences (Mr. J. Korecký). Contractual research continued in 2017 with Lesy ČR s.p. in "Creating of Methodology of Planting Stock Origin Verification", and new contractual research commenced for the Krkonoše National Park regarding the utilisation and sustaining of gene sources. In September 2017, a workshop was held at the DGPFT under the Evoltree project on "Genomic selection and BwB strategy" in which young researches from several European countries took part.

### **Quantitative genetics and forest tree breeding**

A long-term concept of handling the Norway spruce gene pool in Norway was published

in the scientific journal *Frontiers in Plant Science*. It is a result of a four-year long cooperation between the DGPFT and Norwegian Forest Seed Center. The research team led by Mr. M. Lstibůrek was formed by experts from Norway, the USA, and Canada. The long-term concept objective is to harmonise the requirements of forestry and environmental protection, and thus to secure optimum use of the gene resources of the Norway spruce in Norway.

Completing the original method of alternative estimate of heritability in panmictic population represented a significant feat. The result of a five-year long basic research is an article in *Genetics journal*. Mathematicians from the Department of Applied Mathematics of Technical University in Liberec and geneticists from the Department of Genetics, NCSU, USA were participating in the theory research led by Mr. M. Lstibůrek. The existing heritability estimates in the population genetics are built on a random sample of individuals; the new methodology provides for performing of estimates from the trimmed part of the standard division. In order to experimentally verify the new method validity, human data of Francis Galton from 1886 were used.

The five-year long cooperation with the Bundesforschungs- und Ausbildungszentrum für Wald, Naturgefahren und Landschaft in Austria brought expected results as well. The genetic evaluation of the European larch in Austria was performed on the basis of the original methodological procedure devised by M. Lstibůrek. The result of evaluation of twenty individual Larch growing areas and of the subsequent genealogy reconstruction is a newly established seed plantation of the second generation that will serve forest owners in Austria.

Significant application outputs relevant to the territory of the Czech Republic were used to establish new series of more seed plantations and relevant testing plantations at LČR s.p., and at owners of small forests – NAZV projects (LČR s.p., Pexidr s.r.o.).

## **9.6 Department of Forest Management**

In 2017, the Department of Forest Management (DFM) of the CULS FFWS in Prague continued in securing the educational process for the students together with their professional development in the traditional branches of forestry that is Forest Management, Dendrometry, and Forest Production; the branches taught in both, the Czech as well as English language. Besides the stated subjects, the Department secured lectures and training in Statistics, Inventory and Monitoring of Forest Ecosystems, and others.

In 2017, the Department members, starting with the doctoral students and technical bac-

kground staff and ending with the academic staff, aimed their professional activities at two principal areas shaping the nature of the Department on a long-term basis at both, national as well as international level. It was mainly the area of the remote exploration of Earth and data collection with the use of the up-to-date methods of photogrammetry. The second area consisted of the support for decision-making and planning of main felling with the use of modern optimisation methods and geographic information systems. Starting the operation of the system for unmanned aerial vehicle laser scanning – a completely unique technology in the Czech Republic – represents a major breakthrough in the area of use of the UAVs.

The development of the both mentioned Department specialisation areas was also supported through the project activities in 2017. The work continued on National Agency for Agricultural Research (NAAR) project No. QJ1520187 “Development of Unmanned Aerial Vehicles Used in Monitoring in Forest Management” which is devoted to the practical aspects of utilising drones in collection of data useful in forestry. NAAR project No. QJ1320230 “The Decision Support Systems in Forest Management with the Objective of Strengthening the Production as well as Non-production Forest Functions” was successfully completed. Among other things, within the framework of this project, a new system for the Decision Support System (DSS) focused on optimising the regeneration and tending felling was developed. Further professional development in both the areas is ensured even for the next years thanks to the OP RDE project Excellent Research as the Support of the Adaptation of Forestry and Wood Processing to the Global Change and the 4th Industrial Revolution.

In 2017, the Department also celebrated the 110th anniversary of Prof. Václav Korf’s birth. The occasion was marked with holding of an international seminar in Prague aimed at the areas of forest production as well as using the long-distance Earth exploration and modern data collection technologies in forestry. This seminar contributed considerably to the strengthening of the established international partnerships, for instance with the Vienna University of Technology and the Norwegian University of Life Sciences. A new partnership was established also with the University of Georgia in Athens, in which the members of the Department took part in the international conference focused on utilisation of the GIS and long-distance Earth exploration methods in forestry (11th Southern Forestry and Natural Resource Management GIS Conference). The research results were presented in Seattle at the Symposium on System Analysis in Forest Research as well.

Throughout 2017, intensive strengthening and developing of established partnerships with foreign institutions, namely with the Portuguese Institute of Mediterranean Agricul-

tural and Environmental Sciences in Évora, or Trás-os-Montes and Alto Douro University in Vila Real, the Institute of Statistical Mathematics in Tokyo, the University of Lleida in Spain, and the University of Göttingen, Germany, took place.

By their active involvement, the staff members of the Department also reinforced their positions in international and national organisations and groups, such as the ForestDSS Community of Practise, which brings together prominent experts in the area of decision-making support, planning, and decision support systems, or in IUFRO. In 2017, the annual IUFRO Congress was held where the Department representatives presented their own section devoted to the tools supporting the decision-making systems and forest adaptation to the climate change.

## 9.7 Department of Wood Processing

Over the year 2017, the Department of Wood Processing kept concentrating on fulfilling of several tasks. In the area of publishing, the target was publication quality enhancement which led to an increased number of manuscripts submitted to prestigious journals, such as Composite Structures, Composites Part B, Materials, Construction and Building Materials, and others. The research achievements of the Department were published at several prestigious conferences of which the 20th International Conference on Composite Structures in Paris, or ICWSE (“Wood Science and Engineering in the Third Millennium”) in Braşov, Romania represent the most significant ones. The team of our specialists – doc. Gaff and prof. Horáček – asserted themselves successfully, and, at the same time, many beneficial contacts have been established.

The Department makes effort, as it does every year, to prepare new study materials for the students. In this context in 2017, new textbooks were prepared: Handling and Transporting Machinery – Part II, and Introduction to the Power Engineering Use of Biomass. The named educational materials should make the studies easier for the students of not only wood-processing but also of forestry courses.

Throughout 2017, the Department staff submitted, or participated in preparation of several scientific and research projects. This effort brought the first fruit in the form of gaining the TA CR GAMA project aimed at the Programme Development for Evaluation of Mechanical Properties of Wood and DCM. All-faculty project EVA4.0 is another important project involving the Department in which it participates in research of new technologies employable in the newly developing concept Industry 4.0.

The Department was also successful in enlarging the staff team by one senior assistant

and one assistant. They both have actively engaged in the life of the Department, and we can say that their engagement has been perceived in a very positive way. HR development is crucial for the further advancement of forestry branches at the FFWS and is going to be pursued also in 2018. The Department was very actively participating in the endeavour aimed at preparation of background material necessary for institutional accreditation. Very frequent communication and intensive cooperation with the prestigious university of LULEA in Sweden began in 2017; preparations of joint research-development as well as applied projects are already taking place.

## 9.8 Department of Game Management and Wildlife Biology

The year 2017 was for the Department of Game Management and Wildlife Biology unique from the research perspective as well as in the areas of increasing the education and study support quality. The Department entered the new year 2017 with a presentation of a New Year's Eve TV programme "Miracles of Nature" (Zázraky přírody) which had a following of more than 1,000,000 viewers, and in which in almost an hour allocated to us samples of deer sounds were demonstrated.

The most important change from the study point of view came in the system of teaching of Game Management, a subject lectured to the students of the Forestry branch of study. The lectures were not only unified and linked, fundamental content as well as graphic improvements were made, but also practical exercise lessons were innovated at a substantial level; the students have to be working independently and apply their knowledge and findings explained in the lectures with practical demonstrations. The branch of study Operation and Game Management was extended by several subjects that complemented the current curriculum forming a comprehensive model of a study branch. The new subject titled Monitoring of Wild Fauna ranks among the most significant ones. Furthermore, three new textbooks were published, and one title "Introduction into Game Management" was re-edited and provided with new additions. Among other things, this text was provided with an appendix in the form of a re-print of the first ever publication documenting the Czech gamekeepers and hunting jargon. The first edition was published by František Špatný as early as in 1876. In January 2017, for the second time ever, the students were participating in driving animals during the game hunt at the hunting ground of the University Forest Enterprise in Kostelec nad Černými lesy. Together with the students of the Preservation of Natural Objects and Taxidermy branch of study educational panels were created using wood as the main material, now being exhibited in the Pavilion

of Wood Sciences. They are suspended along the corridors so the students can use them in their studies from the anatomy of vertebrates, through odontology to comparative cranial anatomy.

In 2017, the Department performed the final inspection of one of the largest inductors in the world; in the second half of the year, experiments were already carried out using the device focused on the ability of orientation and laterality in hunting dogs. The Department considers it a major success to have recruited Dr. Michael S. Painter from one of the prestigious universities in the USA as our colleague who has been working with us since May 2017. His field of research is the spatial orientation of vertebrates and bio-logging technologies. After his arrival (as a matter of fact even couple of months prior to that) he began to work on preparations for research of wild boar.

Three doctoral students defended their doctoral theses at the DGMWB. Two of those were the first ones of the kind at our University dealing with the magnetoreception in birds (pheasants and Corvidae). The third successfully defended thesis is addressing the morphological differences of the aedeagus structure in the taxonomy of selected genera of Ground beetles (Carabidae). Ing. Miloš Ježek, Ph.D. has thanks to his long-standing research of wild boar become one of the key experts who are instrumental in preventing the African swine fever propagation. At the close of 2017, a new senior assistant was hired by the Department who will be lecturing the students on Animal anatomy and Osteology and osteological preparation.

## 9.9 Department of Forest Protection and Entomology

In 2017, the Department of Forest Protection and Entomology was ensuring the operation in the area of forest protection, that is forest entomology and forest phytopathology for the undergraduate students of Bachelor's programmes (Economic Administration Services in Forestry, Forestry, Operation and Game Management, Preservation of Natural Objects and Taxidermy, Forestry), of Master's programmes (Forest Engineering), and PhD programmes (Forest Protection and Game Management, Forest Biology). The lectures are designated namely for the FFWS students but also for students in other CULS programmes.

Two professors, five associate professors, and five senior assistants were working at the Department under full-time contract in 2017. The Department has also been cooperating with employees of private companies (e.g. L.E.S.), and also of other schools and institutions (ÚKZÚZ, VÚLHM, v. v. i.), which have been participating in the education process as well as in R&D. The Department staff members are also instructors of 20 doctoral students in the

Forest Protection and Game Management branch of study. Seven students were enrolled to the Forest Protection and Game Management branch of study in 2017. In 2017, Ing. František Lorenc successfully defended his dissertation work "The Effect of Drought on Mycorrhizae Growth in Picea Abies".

The foundation of pedagogical activity for the DFPE staff is a structured education process of the subjects Forest Protection I–III, Introduction to Forest Protection, Forest Protection and Entomology all of which are designated for the students of Forestry, Forest Engineering and EASF branches of study; the subject Methods of Collecting the Products of Nature – Part I is taught in the Preservation of Natural Objects and Taxidermy branch.

In 2017, the Department staff guaranteed the solution of a number of scientific projects. The research activities naturally lead to publication activities. The Department staff members were authors and co-authors of dozens of articles in publications in journals with an impact factor. Furthermore, they were co-authors of two certified methodology documents ([vulhm.cz/lesnicky\\_pruvodce](http://vulhm.cz/lesnicky_pruvodce)).

Pedagogic and scientific Department staff members also participated at several conferences – the doctoral students mostly used the opportunity of attending the "Kostelecké inspirování" (Kostelec Inspirations) held at Kostelec nad Černými lesy on 23 and 24 November 2017. Other conferences to which the members of the Department contributed included for instance "Jedle bělokorá – páteř evropských lesů" (Abies alba – European silver fir – the Backbone of European Forests) held on 12 and 13 October 2016 at Olšina u Karlových Varů, the CFS seminar "Trvale udržitelné hospodaření v lesích" (Sustainable Forest Management), the lecture "Červená hniloba a její vliv na stabilitu lesních porostů" (Red Crown Rot and Its Effect on Forest Growth Stability), specialised seminar of the Ministry of Agriculture.

Climatic changes open new space for entrance of dangerous fungal pathogens and the influence of changing climate on the sub-bark insects. The doctoral students also participated at the conference with the title "Aktuálne problémy v ochrane lesa na Slovensku" (The Current Issues of Forest Protection in Slovakia), "Zoologické dny" (Days of Zoology) in Brno, Joint Meeting of IUFRO's in Thessaloniki, Greece, and last but not least also the ELLS Scientific Student Conference 2017 at the Faculty of SCIENCE, Copenhagen, Denmark.

The cooperation of the Department with the national as well as foreign partners was involving not only pedagogy but also science and research. Professionals from L.E.S. (Ing. Viktor Janauer) and ÚKZÚZ (ing. Petr Kapitola) held lectures for the students. There is a whole range of organisations with which we cooperate in science – among others for example BOKU Vienna, Università della Calabria, Rende, Italy, Lancaster University, Lancaster, UK, Uniwersytet Wrocławski, Wrocław, Poland, Technical University in Zvolen, Slovakia, Lesy

České Republiky, IBL, Sekocin Stary, Poland, VÚLHM, v. v. i., Strnady, LOS Banská Štiavnica, Slovakia, Prague City Administration, Krkonoše National Park, Bavarian Forest National Park, and many others.

The Department regularly participates in the Open Days held several times every year. The Department exhibits a large and attractive display namely of live insects and many other items. The staff members of the Department promoted the FFWS in 2017 also during their trips to their "home" high-school establishments where they held lectures providing vital information for the potential future FFWS students. The Department also took part in the promotion of the Faculty at the Paths of Wood fair in Letňany in Prague.

## 9.10 Department of Silviculture

2017 was a year of a series of significant changes for the Department of Silviculture. It seemed to be a matter of urgency to supplement the team with young assistants. At the same time with recruiting young colleagues, the senior staff members were planned to be transferred to another method of financing so that the Faculty was in charge of the current maximum of 6.5 FTE. Conditions should be created for that in 2018. It is also necessary to highlight the unceasing activity of both postdocs in 2017 as their work represented a decisive contribution to the publishing activities of the Department. The number of internal PhD students dropped significantly, in particular, thanks to their successful passing of state doctoral examinations and dissertation defences; however, the current five active full-time DSP students have considerably increased their activity. Three new internal doctoral students have been hired, and four young scientists have also been working effectively.

This staffing arrangement is fully sufficient to cover the needs in lecturing and training. The subjects taught by the Department are related to the fundamentals of forest ecology, forest establishment, and silviculture in various conditions. The Department staff members are also engaged in the teaching of tropical forestry while a substantial proportion of teaching load is also devoted to other CULS faculties, specifically to the FES, FTAS and FAFNR. The teaching of the Department takes place to a significant extent in the field; in particular, when it comes to profile subjects, block field exercises and seminars are quite common. These are concentrated mainly in the territory of the School Forest Enterprise in Kostelec nad Černými lesy, on FR Klokočná (LCR) while the forest establishment is mainly taught at the Truba field station, where there have been educational and laboratory facilities built with a substantial financial contribution from the Faculty and the Department in

the long term. The Department also provides a week-long final field trip to various regions of the Czech Republic and in recent years even to Poland in cooperation with SGGW in Warsaw.

In 2017, two NAZV projects and one TA CR project were completed successfully; nevertheless, two new TA CR projects were acquired to be implemented starting from 2018. Three IGA projects and two excellent outputs were rendered successfully. Thanks to internal research programmes, it was possible to organise an expedition to the Flagstaff research station in Arizona, USA, where data for excellent publications in preparation have been collected. As against previous years, the number of scientific articles in journals grew significantly – 16 articles were published in IF journals, 14 articles in journals in the SCOPUS database, and the results of the Department were presented in scientific journals and at conferences. Staff members were also involved in the preparation of one textbook and four certified methodologies. In the context of building of relationships with the operation, the staff members provided a number of consultations to forest owners and administrators and worked in several professional and scientific organisations. Czech Forestry Society, Czech Academy of Agricultural Sciences, and the Czech Academy of Sciences are the top ones.

### 9.11 Department of Forestry Technologies and Construction

In 2017, staff members of the Department of Forest Technologies and Construction (DFTC) taught 36 subjects for all forestry and wood technology branches of study, including encyclopaedic forestry subjects for agricultural, technical, and environmental branches of study accredited at the relevant Faculties of the CULS. Six subjects were taught in the English language. The new subjects Geodesy and Forestry Bio-economy were provided. The Department also provided for the mandatory practical training of the FFWS students. Four textbooks have been published (Forestry Constructions, Forest Roads – exercise book, Forest Management, and Forestry Ergonomics and Labour Hygiene). Two associate professors and five senior assistants were teaching and lecturing in the Department.

The Department participated in the international cooperation. It coordinated for the FFWS all the three international networks within the “Central European Exchange Program for University Studies” (CEEPUS). This university exchange programme was used to ensure exchanges of teachers and students. In 2017, the DFTC representatives participated at the 50th annual Forest Mechanisation Conference (FORMEC) in Romania.

In the area of research and development, the Department increased performance in publishing

activities. Department staff members were authors and co-authors of nine articles in scientific journals, four certified methodologies, and two monographs. In 2016, the Department participated in two TA CR projects and one NAZV project and also worked on projects in cooperation with the Department of Forest Protection and Entomology and the Department of Forestry and Wood Economics. At the end of the year, eight PhD students and two young scientists were employed in the Department.

Staff members of the DFTC successfully participated in research and development of several forestry machines in 2017. In 2017, DFTC in collaboration with Entracon and the CULS Faculty of Engineering in Prague was granted a patent titled Telescopic Hydraulic Pipeline. In the framework of the TA CR GAMMA project, a prototype adapter for a trenching machine for afforestation was developed in order to be used in areas with a lack of rainfall, while an application for a patent for this machine was filed. The Department held a specialised workshop for the Ministry of Agriculture titled Constructions for Forest Functions (Prague, Brno) with proceedings published later on. Furthermore, the Department held a national conference on the theme of “Proposed Rules for Electronic Reception by Harvesters” in Kostelec nad Černými lesy. Teachers served as lecturers at other events for the professional public and took an active part in all-faculty events such as the Open Days, etc.

### 9.12 Centre of Excellence for Mitigation

In the framework of the EXTEMIT-K project (“Building up an excellent scientific team and its spatiotechnical background focused on mitigation of the impact of climatic changes to forests from the level of a gene to the level of a landscape at the FFWS CULS Prague”, No. CZ.02.1.01/0.0/0.0/15\_003/0000433), the Faculty is building a modern infrastructure to be used by a 17-member scientific team. This excellent team, which is to continue functioning even after the project termination, will focus its research on better understanding of bark beetle, which will allow for mitigating bark beetle negative impact on European forests and optimising production of wood as a renewable energy source. At present, the scientific team is concentrated mainly in the organisational unit “Centre of Excellence for Mitigation” (ETM) in administrative terms. The organisational unit was established on the basis of the Dean’s proposal and consent of the FFWS AS as soon as on 22 November 2016, while in administrative terms, it was incorporated into the Faculty’s structure as of 1 January 2017.

In 2017, the ETM members were intensively developing cooperation with leading institutions from Sweden (Swedish University of Agricultural Sciences – SLU, Faculty of Forestry

Sciences). SLU Professor Fredrik Schlyter is the scientific project leader. Professor Turčáni, the project coordinator, is a provisional administrative leader of the EXTEMIT-K project. Several international experts visited Prague and the project research team in 2017. Prof. El-Kassaby from the University of British Columbia is worth mentioning as he is a significant partner for the EXTEMIT-K project team in the field of genetics and genomics of forest tree species. Furthermore, we hosted Annette Johansson who came with a unique, but in Czech forests yet unused method of bark beetle monitoring with the use of specially trained dogs. Another visitor was Dr. Erbilgin from the University of Alberta, active in the area of forest entomology and chemical ecology. Last but not least, Prof. Hansson from the Max Planck Institute for Chemical Ecology and Vice-president of the Max Planck Society from Jena, Germany, paid a visit to us.

ETM staff have completed the first season of field testing when they set up several pilot experiments namely in the site with an ongoing bark beetle outbreak in the Libavá military training ground. Research also focused on the early detection of bark beetle infestation of trees using electrical drones with scanners capable of examining spectral reflectance and temperature. In parallel, we also developed guidelines for processing of comprehensive data from two-dimensional chromatography with mass detection. Significant work has been also done in the area of dendrometry where dendrochronological data analysed and compiled into a database are processed (the final database will be comprised of around 10,000 trees).

In 2017, new project laboratories were opened in the basement of the Faculty with a focus on bark beetle rearing and on research of bark beetle chemical communication. The laboratories are equipped with state-of-the-art scientific instruments. The HR structure of the team was finalised in the same year. It is necessary to mention difficulties linked with obtaining visas for foreign colleagues mainly from the Third World countries. Despite the problems in the first year, the EXTEMIT-K project represents an outstanding opportunity in terms of HR, science and infrastructure for the entire FFWS, and all the ETM members are going to do their best to seize this opportunity to the fullest.



Conclusion

10

## 10 Conclusion

The FFWS strategic Plan (SP) for 2016–2020 clearly defines the Faculty's path forward to significant restructuring of its life, general quality enhancement and handling of recent challenges produced by the current status of forestry and wood sciences. The year 2018 is the third year in which we pursued the objectives defined by the SP and we consider it a breakthrough year. With the new university management inaugurated in February 2018, the visions have been gradually determined, and we need to respond to this change properly. A new style of university management, openness and support of excellence mean for us greater possibilities for further development on the one hand, but also greater accountability on the other hand. As the Faculty which has scored high with the number of scientific publications with IF for several years at the CULS, we are responsible for a more targeted development of high-quality science and research at the FFWS, but of course also for a significant increase in the quality of the educational process and transfer of our work into practice.

Intensive communication of the Faculty management (mainly the Vice-Dean for Education and Quality Assessment) with the programme sponsors and their cooperation with the subject owners poses a big challenge. None of the said owners should remain isolated with their subjects and programmes, but should form a synthetic part of a whole that will respond to the current, but also future challenges and tasks presented by the society. This gives rise to optimal parameters of the educational process which must not be an agglomerate of subjects with randomly defined curricula. The subjects must be in harmony, which will enable students to understand the reality of forestry and wood sciences and prepare them for alternative solutions required by the society. The fact that we as foresters have come to believe that forestry can exist only in the form in which it is found now, is erroneous. The forestry was different in the past and it will differ in the future too. And that will not depend only on us but also on what the citizens of the Czech Republic will require from us.

In 2018, we will have to complete another pavilion, address two major projects, and change the ways in which we work with people. Department heads, outstanding scientists, postdocs, and PhD students. They all have currently enough financial resources, sufficient quantity of state-of-the-art equipment, and materials, they can travel to visit their colleagues within Europe, but also in other continents. Nevertheless, what awaits

us is preparation, but mainly implementation of clearly prepared visions regarding the focus of modern research. We do not want to do science of “evergreen” type any longer where the following applies: “We have solved this, but we must continue in the process because we do not have fully conclusive results.” Those who will not do things well so that they would have a reason to continue in the same research and spend public money in an inefficient way should not be given an opportunity to do so. No. We would like to have an effective research which will be perfectly methodically prepared with properly commenced experiments which will be evaluated, and the issue will be solved by writing articles and/or applying the procedures. And if we achieve an applicable result, it will be handed over to the forestry and/or timber sector. We will then define another hypothesis for which we will be searching and finding an answer.

We want better communication with forestry and timber companies. Having had the feeling of a futile struggle sometimes when over a few recent years, we “have been cooperating” with some firms only because of our friends there, we must focus on cooperating with forestry and timber operations in a systematic way. In 2018, we launched the process of raising awareness about who we are, what we do, and what we could do for the operations. Unfortunately, we still face a lot of closed doors, and sometimes even at the central bodies of state forestry administration. The current situation is not good for anyone in forestry, and in the end, the resulting feeling is that nobody needs anybody. The research does not need operations, and operations do not need research. As regards this approach, however, we are a global exemption because all over the world, research and commercial organisations work together and it is good for both sides. We have been able to develop cooperation, prepare scientific but also strategic materials for businesses in the timber industry. Space is opening up where a specific firm comes, places a clear order, and we keep searching for answers for their questions and always find them. We have such technical and technological equipment and excellent know-how available that we are able to give answers even to very difficult questions.

We have a great potential for further developing of the Faculty and forestry. But the precondition is that we all stick together and use the opportunities that the current situation offers to us.

prof. Ing. Marek Turčáni, PhD.  
dean

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## **Explanatory notes**

DFE = Department of Forest Ecology

DS = Department of Silviculture

DGPFT = Department of Genetics and Physiology of Forest Trees

DFM = Department of Forest Management

DFPE = Department of Forest Protection and Entomology

DFTC = Department of Forestry Technologies and Construction

DFWE = Department of Forestry and Wood Economics

DGMWB = Department of Game Management and Wildlife Biology

DWP = Department of Wood Processing

DWPWC = Department of Wood Products and Wood Constructions

EXTEMIT-K = The project aims to build a 1+15+1 team, the core of an excellent team, to be a part of the R&D centre when the project comes to the end. The project helps us to set up necessary, modern infrastructure – enabling to gain other international projects.