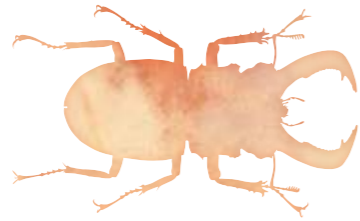




ANNUAL REPORT  
2014





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## IMPRESSUM

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## FOREWORD



Photo: FortBW

Besides the work on research projects and in monitoring, management support activities, advice services and tasks in the field of knowledge transfer formed an important part of the work of FVA employees. Many researchers also took on a committed role working in research bodies, published their findings in national and international journals or presented them at trade fairs, conferences and conventions. For example, the FVA made a successful appearance at INTERFORST 2014, which welcomed over 50,000 visitors. FVA research results were also presented at the IUFRO World Congress in Salt Lake City.

In 2014, important issues in the social field were health management and equal opportunities.

The following pages present a selection of completed projects and interesting news from the research focus areas of the FVA as well as an overview of the most important events of the past year.

I hope you enjoy reading through and of course discover a thing or two in the various activities of the FVA. ☺

Yours sincerely,

Prof. Konstantin von Teuffel  
Director

**D**ear Reader, 2014 saw the successful completion of yet more projects and the start of new and interesting ones. Applied practical research and environmental monitoring, both core tasks of the FVA, were continued, and training and practical workshops were organized – and all this in the »shadow of reconstruction« of the reception and canteen area of the FVA.

Towards the end of the year, the »hard times« were over and employees could enjoy the spacious reception area, newly designed foyer and colourful cafeteria. Even larger events could be held on the premises.



## FROM THE ADVISORY BOARD



Peter Mayer

**D**ear Reader, As the new chairman of the Advisory Board of the Forest Research Institute of Baden-Württemberg, Freiburg, Germany (FVA) I have the pleasure of welcoming you and giving you a brief overview of the activities of the Board in 2014. According to the Statutes of the FVA from 1st January 2000, the Advisory Board is »... a consultative body of the FVA that critically monitors and evaluates the overall development and orientation of the FVA, making recommendations for the strategic direction of the FVA for future research areas and for specific research projects «.

Thus, the task is clearly defined. The Advisory Board provides an often required outside view, discussing strategic developments of the FVA as an organiza-

tion, but also in other areas, especially the work and development of individual departments. The participation of the State Forestry President and others in meetings of the Advisory Board of the FVA brings the political context into the discussion and helps the Board assess the framework conditions of the FVA.

In 2014, as scheduled, about half of the existing Board members were re-staffed (*s. Facts and Figures p. 31*).

The director and the department heads of the FVA addressed strategic issues during this past year that were relevant for the work of the FVA now and in the coming years. Specifically, the issue of Forest and Climate was discussed, which has become, together with monies from the Forest Climate Fund, an important pillar of project financing within the FVA. The Board members welcomed the approved projects focused on »Climate Impact Research« – and especially the newly established project sites. They also welcomed the possibility of cooperation with various partners. These developments further strengthen the competence of the FVA within this broad spectrum of environmental and socio-political issues.

The Board traditionally discusses the work program of the FVA and of the departments in particular at its autumn meeting. On behalf of my colleagues, I thank all speakers for their excellent presentations and the culture of open discussion with the department heads. Thematically, various core areas were discussed and some suggestions for enhancements or possible thematic changes were offered. The Board members strongly supported the work program of the departments.

In addition to content and project-related discussions of the work program, the structure of the departments of the FVA was also discussed. In particular, the Board discussed the relationship of other departments to the Department of Forest Nature Conservation, which uses two-thirds of FVA's budget. In light of the newly filled post of Department Head of Forests and Society, the Advisory Board discussed the possibility of shifting tasks in order to better balance tasks assigned to each department, which would be useful for the further development of the FVA.

In this context, it appears that the Department of Forest Nature Conservation and the Department of Forests and Society already by their designations cover a broad range of sectors. This makes a content-related definition of activities difficult when compared to other departments of the FVA, which are more clearly defined.

A general topic, the data policy of the FVA, was discussed at length by the Advisory Board in 2014. The existing systems, their successes, but also existing challenges were focal points of discussion. The FVA was asked to provide a modified approach to data policy at a future meeting that was based on an interesting discussion that highlighted the experience and solution models

of the Board members and their »home institutions«.

Of particular interest was the changing political and legal framework for the State Forest Service, ForstBW in 2014. The Cartel Office complaint and the resulting proposals for changes in the service area of the state of Baden-Württemberg were presented and discussed. The direct impact on the FVA was classified as probably low; a final decision is still pending.

As a new element of the Advisory Board's activities, the Board members introduced themselves to the employees of the FVA at the autumn session. This exchange was considered to be a very good way to start a conversation and should be repeated from now on in every autumn session. Thus, the Board members hope to contribute to a transparent process of their own work allowing at the same time input of all employees of the FVA to the work of the Advisory Board. ♦

Dr. Peter Mayer  
Chairman of the Advisory Board



## THE YEAR 2014 IN REVIEW

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The year 2014 began with good news for the FVA, with the FVA raising more than two million euros in research funding from the Forest Climate Fund of the German Federal Government. All five projects that the FVA forwarded to the Forest Climate Fund either as the leading party or partner organisation were approved, significantly expanding the FVA research focus »Climate impact research«. The approved projects are aimed at solving specific problems in practical forest management in relation to climate change.

Specifically, these are projects involving the following:

- 1) **Developing a competence network for climate change, crisis management and transformation in forest ecosystems:** This project builds on an already ongoing FVA project involving several federal states. As part of the project, the project team, under the leadership of the Department of Forest Economics, offers training, advice on crisis prevention and management for forest owners and forest personnel, teaching modules for forestry education, advice and support for preparing operational risk management concepts, as well as presentations for different target groups.
- 2) **Providing powerful and high-quality forest reproductive material for a forest of the future that is suitable in terms of climate and location:** This is

spearheaded by the Bavarian Office for Forest Seeding and Planting (ASP), with which the FVA has established a partnership. The project develops principles for a sustainable market supply of high-quality forest reproductive material as a prerequisite for stable and productive forests.

- 3) **Providing suitable forest adaptation strategies for the increasing potential of harmful organisms in precipitation-limited regions related to increasing restrictions:** This nationwide joint project led by the Department of Forest Health of the FVA focuses on the sustainable development of forest health concepts in selected comparative regions of Germany, which are expected to be highly vulnerable due to changing climate, increasing globalisation, and expanding or developing urban areas.
- 4) **Understanding the adaptability and host-parasite relationships of oak as climate changes:** In this project, the economic and environmental performance of sessile oak in view of climate change is evaluated based on provenance trials.
- 5) **Estimating forest productivity and carbon storage as climate changes:** The main objective of the project is to achieve a precise estimation of forest productivity, volume of wood and carbon storage based on different climate development scenarios.



FVA Annual Trip 2014: Bad luck – not only with the weather

Photo: E. Aldinger

### Colourful, closer to nature, older – Baden-Württemberg forests

Baden-Württemberg forests are today more colourful, closer to nature, older and richer than in the previous two decades. In addition, the number of large diameter old trees has increased. This is evident from the results of the third National Forest Inventory (BW13) and by comparison with the results of BW11 and 2. As part of BW13, over 13,000 samples were recorded in the forests of Baden-Württemberg in 2011 and 2012 under the direction of the Department of Biometry and Computer Science of the FVA, involving state-of-the-art information technology. (More on BW13 on page 14)

The results of the third National Forest Inventory provide a basis for further research on the following questions: How much usable wood is available in the next few years from municipal and privately-owned forests? Is this wood available for the market? What are the reasons for the use or non-use of the increase in large diameter old trees? These questions are dealt with by the Department of Forest Economics in cooperation with the Department of Biometry and Computer Science.

The results of the annual forest condition report compiled primarily by the Department of Soil and Environment were more severe than the BW13 results. High spring temperatures and drought as well as a large fruit crop put the forest under substantial strain, especially spruce and beech. Insect pests, such as the

beech leaf-mining weevil, led to further stress. The Department of Forest Health is most concerned about the ash tree because ash dieback is now also increasingly affecting older trees. In contrast, fir trees cope with environmental impacts relatively well. Furthermore, following stress caused by pests over the past few years, even oak is on the road to recovery.

### Lice-ridden fir due to weather

The fir tree was looked at in more detail. The Department of Forest Health investigated the reasons for the fir louse infestation of 2008–2010 and found out the following: The primary trigger behind such fir lice outbreaks seems to be the overall weather conditions. To be precise, a long, mild spring followed by a mild winter encourages the appearance of the silver fir adelgid (*Dreyfusia nordmanniana*) and the balsam woolly aphid (*Adelges piceae*). In addition, a wet and cool summer or, essentially, a good water supply was found to promote the proliferation of the louse. Population or location factors play a modifying role in that the higher the infestation risk, the more consistently the population is built up. For example, virtually no balsam woolly aphids were found in the selection forests studied. Fortunately, firs affected by balsam woolly aphids can also survive a severe infestation. An increased disappearance of firs occurs if the summer following their infestation is warm and dry. Overall, the damage caused by the silverfir adelgid is more significant than

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Working section of Forest Nature Reserves with women power

Photo Dept. of Forest Nature Conservation



Field trip with Norbert Dreher, Rudi Suchant and Eberhard Atolinger

Photo J. Coppes



Forest day at Gailingen

Photo M. Stein

► the damage caused by the balsam woolly aphid because the former leads to younger trees disappearing thereby reducing natural regeneration.

### Rhine floodplain forests as a research object

For years, the diversely used Rhine floodplain forests have been an interesting object of research of the FVA. The aim of this research is to maintain biodiversity typical for the natural area and to develop a forest management system that is adapted to the diversity of forest functions. Projects are in operation to, for example, preserve the biodiversity typical for the natural area and to identify species and ensure genetic diversity of the English and sessile oak (*Quercus robur* and *Q. petraea*). There are also several ongoing projects that focus on

managing the Rhine floodplain forests, including ash/sycamore maple experiments, planting of English oaks in groups, broadleaf tree green pruning and black walnut experiments. Special attention has been given here to the ash dieback since 2011.

The multiple use requirements of the Rhine floodplain forests predominantly owned by the communities adjacent to the Rhine lead to conflicts of interest. In addition, special mapping was carried out in the Natura 2000 areas of the Ortenaukreis district, the results of which is used in the Natura 2000 management plans and forms the basis for nature conservation action planning. For these reasons, the local Forest Service Offenburg and the FVA jointly held an event in May 2014 that dealt with the question of how the diverse nature conservation requirements of the floodplain forest can be met as part of natural forest management.

### Overall concept of forest nature conservation adopted

Since March 2011, the overall concept of forest nature conservation was developed for the ForstBW (State Forest Service of Baden-Württemberg) under the direction of the Department of Forests and Society. For this purpose, various consultation processes were conducted with stakeholders and the public. The public was also involved by way of a broad online participation process. After the state government had approved the overall concept of forest nature conservation in autumn 2014, Minister Bonde presented it at the Forest Nature Conservation Conference, organised by the FVA on 5 December in Freiburg. The overall concept of forest nature conservation includes ten forest conservation goals, including designating ten percent process protection areas in the state forest, securing and restoring

moorland and floodplain forests as well as preserving historical forms of forest use. The long-term goals would be periodically evaluated and then used as a basis for the proposed development of the overall concept after 2020. The overall concept of forest nature conservation is to be implemented in the coming years under the direction of the FVA.

Recreation in Baden-Württemberg forests is also an interesting research topic at the FVA. Using quantitative and qualitative methods, the Department of Forests and Society has investigated how the forest is perceived, experienced and used for recreation and has also remapped the recreational functions. For this purpose, three telephone surveys were carried out between 2009 and 2013 in Baden-Württemberg, each with 2000 respondents as well as 25 qualitative interviews with forest visitors. The aim of the interviews was not only

►



Veronika Braunisch & Stefan Bächle



Berthold Metzger (left) & Horst Dells



FVA Annual Trip 2014: bikers' weather-proofed team

to obtain information about how many people use the forest, how often and for what purposes, but also to find out how the forest is perceived, experienced and used for recreation. The results were combined with geodata from the State Office for Survey and Geoinformation as well as data from the Statistical Office to model the extent to which the forests are used by those seeking relaxation based on spatial analyses. To implement the survey results into forest recreational use mapping, the departments for Forests and Society as well as Biometry and Computer Science developed a GIS-based model that can be periodically adjusted to changes in recreational use. Using some of the parameters obtained from the socio-empirical data as input variables, the model depicts the distribution of forest visitors from their place of residence to the forest and their movement in the forest. Visit lengths determined from the surveys play an essential role on the one hand, and on the other hand, specific landscape elements are also included as attractions into the model.

### Framework agreement for the trade of raw wood

A seven-year negotiation marathon has paved the way for a reliable basis for the raw wood trade in Germany. In mid-December 2014, the committees of the German Forestry Council (DFWR) and the German Timber Council (DHWR) signed the framework agreement for scaling and grading of raw wood (RVR), which entered into force on 1 January 2015. Since the legal trade classification for raw wood (Forst-HKS) – after nearly 40 years of validity – was discontinued in 2008, there were no more binding rules for the raw wood trade in Germany. The leading associations of the forestry and timber industry immediately recognised the need to create joint rules as a replacement for Forst-HKS. The Department of Forest Utilisation of the FVA took over the technical-scientific coordination of the lengthy process that was then carried out. A set

of rules were created with the RVR based on private law and the very latest knowledge. With the RVR, the participating businesses involved in the forestry and timber industry as well as research established a »standing committee for the RVR« and thus documented the need to be able to adapt the rules constantly for technical developments and changing demands of the industry. (See page 16)

### Bark damage caused by timber harvesting

2014 also saw the completion of the interdisciplinary project of the Departments of Forest Utilisation, Forest Growth, Forest Health, as well as Biometry and Computer Science regarding bark damage caused by timber harvesting. Changes in conditions regarding timber harvesting due in part to new forestry machine development, increasing mechanisation and year-round timber harvesting, inspired the FVA to investigate the factors influencing bark damage. The results show that

a considerable amount of bark damage is caused during timber harvesting. Spruce and beech are particularly affected. The presence of bark damage depends primarily on the level of intervention, distance to the access routes and the working method. Business-specific factors such as work organisation as well as the training and skills of the workforce employed also played a role. Economic losses are caused primarily by wound rot, which may also later lead to growth impairment, and by the bark features of the damaged trees. The tree species that were investigated (spruce, fir and beech) had different mechanisms to deal with bark damage. The findings were published in the journal AFZ-DerWald 24/2014. (See page 18)

You will find brief articles below presenting selected topics and projects that FVA researchers have dealt with over the past year. A list of projects in operation at the FVA and completed in 2014, as well as in-depth information about events, activities and publications can be found at [www.fva-bw.de](http://www.fva-bw.de).



## THIRD NATIONAL FOREST INVENTORY DOCUMENTS FAVORABLE FOREST CONDITIONS IN BADEN-WÜRTTEMBERG

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**T**he results of the third Federal (National) Forest Inventory (»Bundeswaldinventur« BWI) were published in October, 2014, providing a positive summary regarding the state and the development of the forest during the last decade. BWI is a joint task force of federal and state forest authorities and is implemented according to the Federal Forest Act in a 10-year cycle. The states are in charge of data collection. In Baden-Württemberg the Forest Research Institute, FVA, is responsible managing survey data. Data collection took place in 2011 and 2012. Altogether, ten field crews measured and recorded much data on 13,232 plots, which yielded a comprehensive pool of facts and figures about forest conditions.

In Baden-Württemberg, the three surveys cover a period of 25 years - from 1987 to 2012 – and provide an overview of forest development, which exhibits remarkable dynamics. Forest cover has increased slightly, which demonstrates that forest patrimony has been preserved – a success of forest protection by the Federal Forest Act in a densely populated country with continued high land use.

Forest conditions described in the 2012 inventory confirm trends at state and federal levels that already were noticed 10 years ago in the 2nd survey. The proportion of conifers continues to decline, especially Norway spruce and Scots pine, with a corresponding increase in the proportion of deciduous tree species, which now

occupy 47 % of forest land area. Growing stock continues to rise and has reached 499 million m<sup>3</sup> solid volume over bark, 377 m<sup>3</sup> per hectare, and stocks of large dimension timber (trees with a minimum diameter at breast height of 50 cm over bark) also continue to increase. Simultaneously the ecological quality of the forest as a living environment has improved as indicated by increased species diversity leading to a tree species composition that is close to natural forest conditions. Deadwood stocking has increased as well, albeit moderately. Only mean volume increment over the period from 2003 to 2012 has decreased compared to the preceding period 1987 to 2002. Previously periodic volume increment reached 13.8 m<sup>3</sup> per year per hectare, but now it has decreased to 12.3 m<sup>3</sup> per hectare per year. Nonetheless, this lower increment is still the highest compared to the other federal states in Germany. The reason for this reduction is the decrease in the proportion of fast growing younger age classes of conifers (now stands are older, the proportion of conifers has decreased). Moreover there might have been a climatic influence at the beginning of the period; the very dry year 2003. Generally, we have been observing a long-term decrease of diameter growth in spruce and beech on experimental plots.

The most important results of the BWI were presented to the forest expert community in a colloquium held at FVA in Freiburg on October 29<sup>th</sup>, 2014.



BWI3 field working

Photo W. Scholtes



Uptake of probe points

Photo F. Frech



Digital data entry

Photo F. Frech

One conclusion was that the results of the BWI substantiate the concept of close to nature forest management as practiced in Baden-Württemberg and demonstrates that foresters are on the right track. However, there were other differing views of the results. From a silvicultural point of view, the decrease of conifer proportions is an opportunity to rethink the future of conifer development and to reverse this downward trend by silvicultural means to ensure a long-term supply of raw material for the wood industry, which mainly depends on softwood.

A stakeholder of nature conservation and one from timber industry gave statements at this colloquium and it became evident from these statements that despite the general favorable development of forest conditions, not all desires may be satisfied. For instance, the result that as forests become older trees get larger can be interpreted in different ways. While the nature conservationist is satisfied with this consequence, wood industry representatives are not and are very skeptical about whether the supply of the needed variety of wood dimensions will be assured in the long run. Thus the same consequence is interpreted contrarily: for nature conservationists the forest should become even older and trees much larger, whereas wood consumers see a »demographic« problem because forests are too old

and trees too large! Wood consumers are critical of decreasing softwood stocks because sawmills heavily depend on small and medium-sized softwoods, especially spruce wood.

These contrary viewpoints unveil conflicts of goals, which constitute a big challenge for forest policy makers and forest service managers to satisfy all forest functions while managing the forest in a way that maximizes the benefit of the forest to all of society. Given these partly opposed demands on forests it becomes obvious how important figures are which – despite contrary interpretation - contribute to objectification and thereby can form the basis for rationale decision making.

I need to close with a remark regarding possible misunderstandings and discrepancies when interpreting the results of the BWI. The data document favorable forest conditions as a result of forest management. However, to conclude that forests are doing well regarding their ecosystem state is not supported. Recently published results of the annual forest health survey suggest that there are still risks for vitality and stability of the forests, which is cause for concern in the face of imminent climate change since vitality is crucial for the forests' ability to adapt to changing environmental conditions. ☛





## RVR – THE NEW BASIS FOR RAW WOOD TRADE IN GERMANY

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On December 11, 2014 a new framework of agreement for scaling and grading of raw wood in Germany (Rahmenvereinbarung Rohholzhandel, RVR) was signed by the presidents of the two major German associations of forestry and of the timber industry, Georg Schirmbeck (German Forestry Council, DFWR) and Hubertus Flötotto (German Timber Council, DHWR). After seven years of negotiations, the RVR is now available to all participants involved in the raw wood trade. The RVR was developed jointly across all sectors of the timber industry and its practical implementation is recommended for all parts of Germany. Throughout the years, the FVA has coordinated the development of the RVR and has provided technical and scientific expertise.

### Background

From 1968 to 2008 the legal framework for scaling and grading of raw wood in Germany was set by the »law on raw wood grades« (Forst-HKLG) and the »bylaw on raw wood grades« (Forst-HKLV). Detailed technical guidelines were given in a rider to the bylaw, which

was named Forst-HKS. Due to deregulation efforts of the European Commission the basis for this law was abolished at the end of 2008. As a consequence, the DFWR and the DHWR decided to develop scaling and grading guidelines organised under private law. It was clear to all the experts involved, both from the forestry organisation and from the timber industry, that the outcome would be based on the result of negotiation and not solely on technical or scientific criteria.

Given these newly created guidelines the following objectives should be met in particular:

- Creating a nationwide uniform, transparent basis for scaling and grading of raw wood
- Including the already established and approved elements from the old guidelines in the Forst-HKS
- Integrating new technological developments (e.g. scaling at mill site)
- Accounting for changing assortment structures in the raw wood market and of European standards for sawlog grading.



Measurement of knot diameter



Branch stub buried inside the wood (beech), measuring the height ( $H$ ) and width ( $B$ ) of the bark scar



Branch stub buried inside the wood (oak), measuring the size of the bark scar

### What has changed?

Proven elements of the Forst-HKS were adopted in the RVR and modifications were made if necessary with respect to terminology or conformity to current standards of legal frameworks. Two examples are the manual measurement of logs in the forest and the distinction of four saw log grades »A« to »D«. Of these grades class »B« is supposed to describe the majority of all logs. New is the listing of approved measurement methods and dimensional units that can be used for billing purposes. The new and innovative methods of harvester measurement and photo-optical measurement had to be disregarded because they cannot be performed in conformity with current official calibration laws. All measurement methods are described in detail in the enclosed technical section of the RVR. One exception is scaling at the mill gate, which is regulated in the established framework agreement for scaling at the mill gate (Rahmenvereinbarung Werksvermessung).

Changes in the quality grading rules for saw logs are new, as well. The grading criteria have been harmonised for all 16 federal states of Germany. For softwood, the differences in the kinds of knots have been revised

and the focus is now not only on whether a knot is dead or sound, but also on whether it is encased (loose) or intergrown. One change in the grading of hardwood is that branch scars are now considered in beech log grading. They can be used to calculate the clear wood content of a log and are, therefore, important indicators of possible log use.

### Perspective

The agreement needs to be applied in practice now in order for it to come to life. It is expected that the contents of the RVR will be adapted to technical needs of the forestry sector and the timber industry in the future. The ability to adapt is already accounted for by the flexible structure of the agreement. For such future changes a permanent committee will be established by the DFWR and the DHWR and experts will be brought in as consultants. Using this arrangement will guarantee that the agreement will stay up-to-date and the interests of all involved partners will be represented. At the same time, a generation-spanning knowledge of management for scaling and grading of raw wood in Germany will be established. ☛



# HARVEST-INDUCED BARK DAMAGE: A PACKAGE OF RESEARCH PROJECTS

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When trees are harvested, it is virtually impossible to avoid that at least a certain number of the remaining trees will suffer some harvest related damage. However, there is much evidence that in forest practice the amount of bark damage inflicted during a harvest operation often exceeds tolerable levels. For this reason, a series of research projects were carried out at the FVA in order to better understand this situation. Several departments were involved in investigating factors governing the level of bark damage inflicted on remaining trees and the consequences resulting from these factors.

For many years, foresters have been well aware that harvest operations are necessarily associated with – unwarranted – bark damages to remaining trees. Likewise, they have known that such damages may result in serious economic loss triggered by wound rot and other pathogens. In fact, a comprehensive project had already been carried out at the FVA targeting the factors governing the level of harvest-related bark damages in the 1970s (Meng 1978). However, since then, technical, silvicultural, and organizational framework conditions have changed considerably. For this reason, a reinvestigation seemed timely. New research topics covered many aspects. They ranged from analyzing the frequency of bark damages and modeling the influence of factors related to harvest techniques to investigating the response of trees to bark wounds and resulting consequences for the quality (grade) of lumber affected by wound-induced decay. The diversity of targeted topics clearly suggested the involvement of several FVA departments according to their specific area of competence: forest utilisation,

biometrics, forest health, and forest growth. Since a major concern was that research results be applied to improve practical forest management, the focus was on analyzing databases in accordance with actual practice in order to generate generalized recommendations. On no account did we intend to produce just another case study whose application was restricted to specific situations within a rather narrow frame of conditions. Analysis of data from large-scale forest inventories or extensive sampling in a multitude of practical harvest operations ensured that the databases used in the analysis were in step with actual practice. In addition, we included expert knowledge from forest practitioners. In order to provide the basis for broader generalization of results, the latest methods for statistical analysis and modelling were used, which were capable of matching adequately on one hand the requirements of extensive but heterogeneous databases and on the other hand the requirements of complex research questions. An important objective of this research was investigating possible species-specific differences in the trees' response to bark wounds, fungus infection, and timber degradation. In addition to using »classic« mycological, microscopic, or annual ring analysis methods we made extensive use of the potential of computer tomography, a technology that recently became available at FVA. We believe that we achieved noteworthy results. Our belief holds true with respect to scientific publications (currently seven papers already published in peer-reviewed journals and three submitted) as well as the relevance of the achieved results to practical management. The FVA research team succeeded in publishing eight different papers in a special issue of AFZ-Der Wald at the end of 2014, which emphasized the topic of harvest related bark damages. The journal

AFZ-Der Wald is widely read among forest practitioners. Major results were:

- Norway spruce and European beech are obviously a major problem because both species display rather excessive rates of harvest induced bark damages.
- With regard to harvest technique, the most important factors governing the frequency of harvest-induced bark damages are (listed according to decreasing rank of importance): intensity of thinnings, distance to skid trails, harvest system (in combination with length of logs produced), skidding distance, tree species, and height of trees.

Furthermore, our analyses strongly indicate that in addition to directly measurable factors related to technical or natural aspects (tree-, or stand-specific) other »soft« factors appear to strongly impact the level of harvest related bark damage. The challenge was that such »soft« factors are very difficult to measure, if at all. However, the statistical methods that we used allowed for indirect quantification, e.g., through so-called »random effects« in mixed modelling approaches, and demonstrated that these factors were mostly related to the level of the forest enterprise. Thus, we concluded that they are predominantly organizational or staff related in nature. Response patterns of trees to bark damages and timber degradation triggered mostly by fungus infection pro-

ved to differ notably between Norway spruce, European fir, and European beech:

- In spruce, extraction wounds inflicted at the lower portions of the stem result in extensive disturbance zones with reduced water content in the affected sapwood portions. These disturbance zones are most probably the major reason for the species' striking vulnerability to fungus infection and wood decay.
- The compartmentalization of superficial extraction wounds is much more effective in fir compared to spruce. Wound related sapwood disturbance zones are of minor size, and the risk for timber degradation triggered by wound rot is rather low.
- The same appears true for extraction wounds in beech. However, felling wounds inflicted along higher portions of the stem in this species result in considerable sapwood disturbances and are associated with considerable economic degradation of the logs.

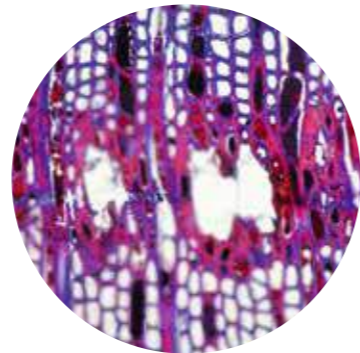
Interestingly, a statewide poll clearly indicated that, as a rule, the expert knowledge of forest practitioners and research results achieved through quantified analyses appear to be rather congruent for a wide range of aspects concerning the factors actually governing the level of harvest related bark damage and timber degradation.



However, there are two conspicuous exceptions. On one hand, the majority of forest practitioners are not (sufficiently) aware of the fact that harvest related bark damages occur at a rather high level and continue to display an increasing trend. On the other hand, »soft« factors, not directly related to technical or natural aspects (e.g. commitment of the management with respect to compliance with quality standards) are only rated among minor factors. This is a pity, as the modelling results strongly suggest »soft« factors like skills, problem awareness, and motivation/commitment might offer a potential for improvement of the same magnitude as the optimization of technical aspects..

*Literature*

- ▷ *Forschungsteam der FVA (2014): Rindenschäden – Rinde weg durch Rücke- oder Fällarbeiten, was nun? Themenschwerpunkt mit 8 Beiträgen, AFZ-Der Wald 69 (24), 10-29.*
- ▷ *Meng, W. (1978): Baumverletzungen durch Transportvorgänge bei der Holzernte - Ausmaß und Verteilung, Folgeschäden am Holz und Versuch ihrer Bewertung. Schriftenreihe der Landesforstverwaltung 53, 159.*



*European fir, traumatic resin channels*



*harvest-induced bark damage*



*European beech disk sample*  
 RS = skidding damage  
 FS = felling damage  
 BHD = disk at the breast height (undamaged)



## ASH DIEBACK

BERTHOLD METZLER, RASMUS ENDERLE AND HORST DELB  
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Ash dieback first occurred in Europe in 1992 in north-eastern Poland. Now this serious tree disease affects European ash (*Fraxinus excelsior*) throughout most of its natural range in Europe. In Baden-Württemberg, the symptoms were first detected in plantations and natural regeneration in the spring of 2009. This disease affects ash trees of all ages and site conditions. The FVA is studying ash dieback intensively.

The causative agent of ash dieback, the ascomycete *Hymenoscyphus fraxineus*, (syn. *H. pseudoalbidus*), is suspected to have been unintentionally imported from eastern Asia. There, the fungus lives inconspicuously and harmlessly in the leaves of the native ash, *Fraxinus mandshurica*. However, in European ash the fungus penetrates through the petioles and then into the shoots and kills them. Furthermore, we recently observed that the same fungus can also cause collar rots. Subsequently,

underlying segments of sapwood die, which causes an increased risk of tree hazards because of the action of opportunistic wood decay fungi.

At the FVA we focus on estimating resistance potential that exists in our ash populations. In this regard we cooperate with the Institute for Forest Ecology and Forestry Rhineland-Palatinate, and with the Bavarian Office for Forestry Seeds and Plant Breeding. We also maintain a scientific exchange with the European COST Action »FRAXBACK« (FP1103).

The continuous deterioration in the health of pole-sized ash in a provenance trial has been monitored annually since 2009. Twenty percent of the trees have died. Another 20 percent of the ash trees have already lost more than half of their crown to the disease, so they are also expected to die within a few years. In contrast, only one percent of the trees is completely



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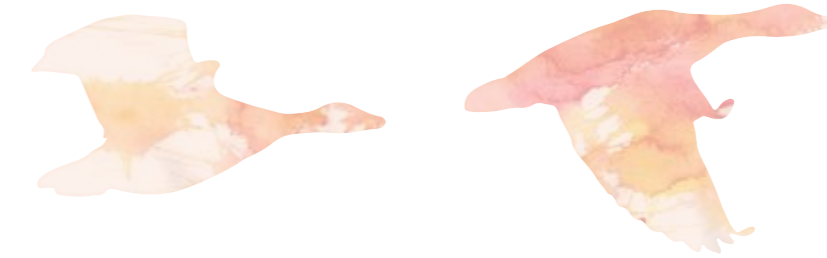
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1. Apothecia of the causal agent *Hymenoscyphus fraxineus* on an ash petiole of the previous year
2. Crown dieback of an affected ash with some replacement shoots
3. Discoloration and wood decay after infection of the root collar



The joint research team of Rhine-Palatinate and Baden-Württemberg

Photo: B. Metzler



## FOREST MANAGEMENT AND NATURE CONSERVATION IN THE UPPER RHINE

EBERHARD ALDINGER · Dept. of Forest Nature Conservation | eberhard.aldinger@forst.bwl.de

- ▷ devoid of disease symptoms. Grafts were taken from these healthy trees to investigate the stability of clones to resist the disease.

We also studied the extent of resistance in 250 clones within seed orchards near Emmendingen, Schorndorf, Kusel and Landstuhl, which included more than 1700 grafts. The differences in susceptibility within the clones and between the clones showed that about half of the observed variance was genetically determined. This means that the inheritance of susceptibility is similar to that demonstrated for Scandinavian populations. A small percentage of the southwestern German ash trees is fairly resistant. These trees may be a source for both natural regeneration and planting stock for a healthier ash generation in the future.

Currently, disease progression and mortality in pole as well as in timber sized trees is driven by the sharply increasing number of collar rots. In particular, ashes in moist or water logged sites are seriously affected. These are prone to butt rot fungi, primarily *Armillaria* species. The increasing risk of tree hazards is of great

importance to foresters dealing with work and traffic safety. In this regard, the FVA Department of Forest Health advises forest authorities, issues numerous publications, and contributes to press reports, and radio and television programs. ☛

### Literature

- ▷ Enderle R; Nakou A; Thomas K; Metzler B, 2014; *Susceptibility of autochthonous German Fraxinus excelsior clones to Hymenoscyphus pseudoalbidus is genetically determined*; *Ann. Forest Sci.* 72 (2015): 183-193. DOI 10.1007/s13595-014-0413-1.
- ▷ Enderle R; Peters F; Nakou A; Metzler B, 2013; *Temporal development of ash dieback symptoms and spatial distribution of collar rots in a provenance trial of Fraxinus excelsior*. *Eur. J. Forest Res.* 132: 865-876.
- ▷ Metzler B; Baumann M; Baier U; Heydeck P; Bressen U; Lenz H, 2013; *Bundesweite Zusammenstellung: Handlungsempfehlungen beim Eschentriebsterben*. *AFZ-Der Wald* 68 (5): 17-20.

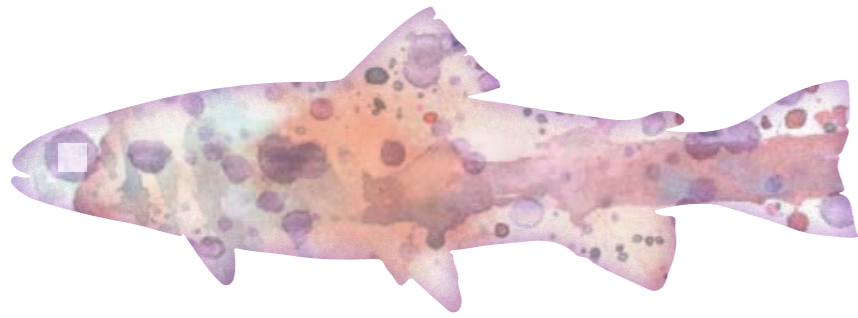
With the expansion of the Rhine, local conditions within the Rhine floodplain have fundamentally changed regarding water regime. In what are known as ponds along the Rhine floodplain between Breisach and Iffezheim, there were large water level fluctuations during springtime of approximately 2 m above and below mean water level. Today, the floodplain through the canalised Rhine is in a static state, with large areas no longer flooded (»former floodplain«). The groundwater level is fixed by reservoirs and varies only slightly. Moreover, flood waters arrive faster with greater eutrophic water, and sometimes with higher levels than previously. Due to the impact of these revised growth conditions, the FVA, in close collaboration with the Regional Authority of Freiburg, has recently revised the site-related principles underlying the water regime on approximately 6,000 out of a total of about 7,200 ha of forested area along the Rhine.

Today, on about four-fifths of these areas, the forest is growing on sites where there is no more flooding. We class these areas as »former floodplain«. Alternatively, this means that approximately 20% of the floodplain forest area consists of places that are at least periodically flooded. Nutrient-rich silt deposits ensure high levels of forest growth on almost two-thirds of the newly classed area, meaning that sites with high growth rates are far more common now than in the dynamic historic Rhine floodplain.

Under today's conditions, naturally occurring primary tree species of floodplain forests are ash, sycamore maple, hornbeam, European beech, and on the wet, but increasingly silted sites also the relict white willow. It is becoming apparent that, locally, conditions are moving towards a terrestrial ecosystem.

Local conditions are changing once again as a result of retention areas for flood water that are in operation or under construction at thirteen locations along the Upper Rhine. These retention areas will control flooding and create habitats similar to those found on floodplains. Site-related fine mapping and modelling of floodplain forest levels expected under the new water regime are the basis for planning how to deal with the forest in the future.

Today, the main tree species in the current population of the floodplain is ash, followed by sycamore maple, poplar species and willow species. The elm that shaped the forest until the 1970's has largely disappeared as a result of Dutch elm disease. Due to a new fungal disease, ash has also experienced a massive dieback recently and this can lead to entire portions of the forest dying off. This is an ominous development for forest owners whose communities are adjacent to the Rhine. For example, ash trees in the city forest of Kehl represent 20% of the population and cover more than 40% of forest area across 350 ha. Once ash disappears, we cannot expect any immediate natural forest regeneration



*Floodplain at the Elz River*

*Photo M. Rupp*



*»Old« Rhine floodplain Taubergießen*

*Photo M. Rupp*



*Pole stage in an ash forest*

*Photo E. Aldinger*

- ▷ of these populations with other tree species suitable for the location. Consequently a long-lasting shrub stage with clematis is likely to inhabit these sites in the future.

Floodplain forests of the Upper Rhine are still home to numerous rare and endangered animal and plant species in localized areas. The vast majority of the Rhine floodplains are subject to the special protection of a nature conservation law. Out of 7,200 ha of floodplain forests, over 6,300 ha are protected under nature conservation requirements. The aim is to restore habitat conditions typical of floodplains wherever possible and to allow the environment to develop in a way that is characteristic of floodplains, i.e. to allow flooding. On the one hand, communities of species typical of floodplain forests should be able to develop within the largest possible undisturbed habitats; but on the other hand, a high structural diversity with correspondingly rare structures can only be produced and maintained by human intervention, especially in locations in the »former floodplain«. It is important to also create opportunities for species to develop that are dependent on undisturbed habitats. The concept of combining rare structures and locally adapted old and dead wood that uses protected individual trees, habitat tree groups and specially designated forest refuge areas allows for a type of species protection that is adapted to the small dimensions of the floodplain.

A model for a floodplain forest management system designed for the future and underpinned by nature conservation can be based on meaningful scientific site-related findings that incorporate the requirements and the dynamics of tree species, e.g., in the case of oak, based on the results of genetic tests. In many cases, forests on the floodplain can be used and habitats preserved using an integrated approach. Light-demanding tree species in floodplain forests, especially in the »former floodplain«, must in many cases be favoured through forestry operations if they are not to be shaded over during the coming decades.

Nature conservation goals can and should be met through management, especially when it comes to conserving oak forests. It is important here to align the management of oak forests with the conservation objectives of the respective Fauna-Flora-Habitat (FFH) area. Sometimes, forest-owning communities are willing to pay the high investments for oak cultures needed to establish new oak-rich forests. Especially with oak forests, intervention measures are justified for silvicultural reasons, which especially benefit oak, and can prevent any deterioration of the situation regarding nature conservation. These measures are used to create and maintain rare forest structures that are key to nature conservation.

The conservation objectives of the FFH management plans can/must determine the extent to which oak forests of the Upper Rhine are to be preserved overall. The objective for municipalities is that forest habitat types and habitats are to be preserved at least »in their current scope and previous quality«. For a municipality, this means that the conservation objectives of the FFH management plan will have to be adapted to the communal forest when developing a model. Certainly, opportunities to promote oak cultures will play a major role when a local council decides how much oak cover can be re-established. In forest management planning, nature conservation requirements must therefore be weighed against the interests of the timber industry, fishing and recreation, as well as the supply of firewood, which also assumes a very important role in many community forests. ☛



## MAPPING PRODUCTS IN FOREST SITE SURVEY

– *hardcopy products are still a decent means to bring information to the practitioner*

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Soon after the first suitable programmes were developed, Geographic Information Systems (GIS) were integrated into the working procedures of forest site mapping. These systems represent an efficient means of managing data gathered at different points in time and in different locations, storing them for future evaluation and presentation. The use of digital tools in forest site mapping was consistently improved by introducing the model-assisted site mapping system (MOST) in 2013. Technicians in forest site mapping no longer use pen and paper, but instead use a Toughbook and GPS-mouse. Some foresters are tempted to make the statement »this is something we also need for fieldwork!« However, some time will pass until the digital world can accompany all forest practitioners in their daily work.

The requirements on output products of forest site mapping are therefore above all to:

- provide easy access to forest site information
- choose a format that is easily readable
- support rapid and complete interpretation of the information provided.

Today, forest technicians are comfortable reading standard forest management maps, which have been available for a long time. Unfortunately this is not so with reading forest site maps because such maps were often not readily available for potential users in the past. A survey conducted among regional forest authorities made one point clear: there is not one ideal output-format that serves all individual needs.

Therefore the FVA develops appropriate output designs and formats, either analogue or digital, and makes them available to staff within the different hierarchy-levels in the organisational structure of ForstBW. The most recent product developed in the FVA - based on its successful predecessor – is the Forest Site Atlas.



Forest Site Atlas with maps

### The Forest Site Atlas

The Forest Site Atlas has been enhanced by tips and hints of forest practitioners. With the newly designed Forest Site Atlas, site information is processed for a broad circle of users. The Atlas maintains the already proven DIN A 4 - folders with maps divided into regular sheets using a 1:10000 scale. Laminated sheets provide a durable finish, enabling the user to take the product outdoors. This folder-option is provided to forest county administrations within their area of responsibility. However, the folder option is not available to the forest districts at this time due to the reorganisation of the forest administration in Baden-Württemberg.

The Forest Site Atlas is published with matching legends, recommendations concerning tree species and site-specific suitability and a handbook describing detailed soil-site characteristics. The availability of this detailed background information is what enables the forest engineer to implement a silvicultural strategy based upon soil site characteristics.

The Forest Site Atlas is produced for forest management districts, where mapping of soil-site characteristics is completed for all forests that are under public

ownership, mostly forests of the federal land of Baden-Württemberg or local authorities. That means these atlases are produced a little at a time as the mapping process in the field continues.

Folded maps at a scale of 1:10000 are issued together with the Forest Site Atlas. Forest Engineers oftentimes ask for maps in larger formats because it is easier to get an overview of the forest management district. These large format maps are delivered in sturdy boxes for transportation in the field.

The section of forest plant ecology within the FVA, where the maps are produced, believes that it is very important to provide this information to any hierarchy level within the forest administration, even in times of uncertainty caused by consecutive reorganisation activities.

Large format maps are produced easily with the technology located at the FVA and are easily adapted to organisational changes. A very robust, barrier-coated paper was selected as a suitable print paper: one that can even handle light rain showers according to the manufacturer. This property has been tested by means of a ▶

Photo: T. Weidner



The site mapping is completely digitalized

Photo M. Morrell

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practical »coffee mug test« in the FVA and the claim was verified. The print paper is priced considerably lower than the classical laminated map (maps glued on robust tissue), but still offers good durability. By keeping certain steps of the production process within FVA, it is possible to respond to map reorders quickly if needed.

#### The preliminary Forest Site Map and report

In 2013 the strategy in planning mapping projects changed due to changes in the mapping method used. Now it is uncommon to plan based on forest organizational units but instead planning is based on natural areas (Eco-Regions). Mapping projects have an operational time of least 2 years, but can take considerably longer. A mapping project finished by the contractor is provided as soon as possible to forest management districts to enable them to work immediately with the results of the current mapping. The maps provided are called Preliminary Forest Site Maps. These Preliminary Forest Site Maps include the results of recent mapping projects and previously mapped adjacent areas.

Furthermore, results of site mapping projects are documented in a final report. Within this report forest sites

are described according to characteristics like relief, geology, vegetation and soil properties. Evaluating tree species in terms of suitability on a particular site is important when planning silvicultural activities. All documents referring to these recent mapping projects are provided in printed form to the forest management district. Furthermore all information is available on a DVD to enable the forest management district to distribute the information to local foresters digitally.

#### Description of Eco-Regions

Baden-Württemberg varies climatically and geomorphologically, so forest site mapping is organized logically into Eco-Regions or Natural Regions. After completing forest site mapping within an Eco-Region it is therefore obvious to describe the characteristics and boundaries of the forest sites in detail. These detailed reports encompass all existing knowledge on soils, climate, geology, vegetation, potential natural forest types and various aspects of forest history. All factors play a crucial role in forest ecology and since forest site mapping is understood as a mapping method in forest ecology, all these factors need to be taken into account.



Regional monographs will be published after Eco-Regions are completely mapped in 2015. The compilation of regional monographs is a challenging undertaking. All existing mappings in an Eco-Region taken partially from over 30 years must be merged and condensed into a single volume. That is why Regional Monographs are edited step by step. The publication of regional monographs for the Eco-Region »Klettgau« (EWB 7/09) and »Weißjura-Moräne bei Engen« (TB 7/05alpha) is planned for 2015.

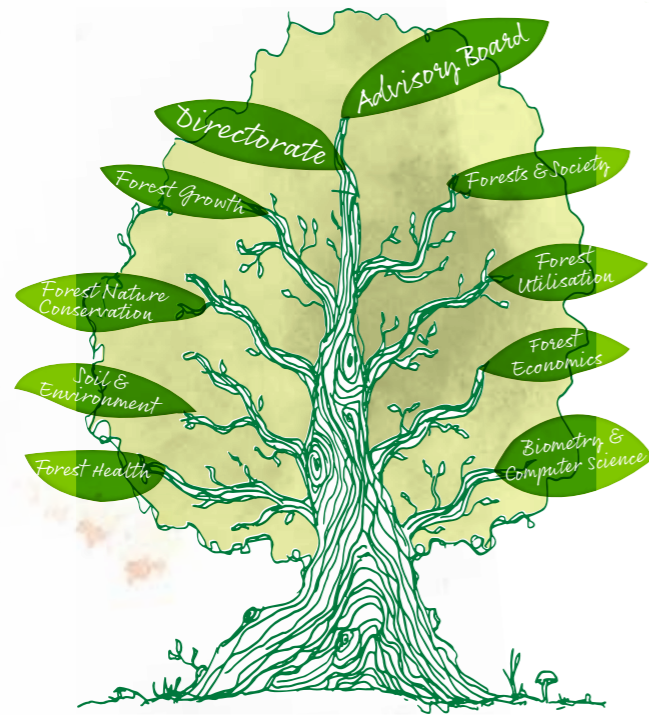
#### InFoGIS and Geo-Data-Portal Baden-Württemberg

After completion of the mapping and quality assurance of the forest site data at the FVA, they are recorded in the national database of Baden-Württemberg and are then available on the ForstBW-Intranet platform for geographical Information (InfoGIS). To provide data to the public, forest site data are also published via the Geo-Portal Baden-Württemberg. Legally, only forest site data for forests owned by the federal land of Baden-Württemberg are permitted to be distributed.

#### Outlook

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As we develop output products, we already foresee that new requirements regarding how we represent forest site data that we provide will need to be accounted for. These requirements are primarily associated with the switch in format from analogue to digital. When publishing paper products, a scale of 1:10000 is still a compromise between accuracy and operational application. In terms of content there is a considerable loss of information. In fact the mapping scale used by the forest technician who carries out site mapping via a Toughbook is usually 1:1800. That means considerably more detail is mapped that can be published through existing output products. The step towards a presentation where information is provided that is scale-dependent and thus able to represent smaller scale details will need to be addressed in the future. »



## ORGANIZATIONAL CHART of the FVA

### DIRECTORATE | DIRECTOR

- Prof Konstantin von Touffiel**
- Administration and Management
  - Central Technical Services and Library
  - Knowledge Transfer and Public Relations
  - Controlling

### Dept. 1 | FOREST GROWTH

**PROF DR ULRICH KOHNLE**

- Network of Longterm Experiments
- Growth and Environment
- Growth Modelling

### Dept. 2 | FOREST NATURE CONSERVATION

**DR EBERHARD ALDINGER**

- Forest Plant Ecology
- Forest Biotops
- Natura 2000
- Forest Nature Reserves
- Wildlife Ecology
- Forest Tree Breeding<sup>1</sup>
- Forest Plant Genetics<sup>1</sup>

<sup>1</sup>in co-operation with ASP Teisendorf

### Dept. 3 | SOIL AND ENVIRONMENT

**PD DR KLAUS VON WILPERT**

- Environmental Monitoring
- Soil Physics
- Forest and Water
- Nutrition Budget of Forests

### Dept. 4 | FOREST HEALTH

**DR HORST DELB**

- Research on Forest Entomology, Zoology and Forest Pathology
- Monitoring, Prognosis and Control of Forest Pests and Diseases
- Forest Health Advisory Service

### Dept. 5 | FORESTS & SOCIETY

**PROF. DR. ULRICH SCHRAML**

- Multifunctional Forestry and Sustainability Standards
- Landscape Management
- Forest and Environmental Policy Research

### Dept. 6 | FOREST UTILISATION

**DR. UDO HANS SAUTER**

- Harvesting and Logistics
- Wood Measurement, Scaling and Grading
- Applied Wood Research
- Energy Wood

### Dept. 7 | FOREST ECONOMICS

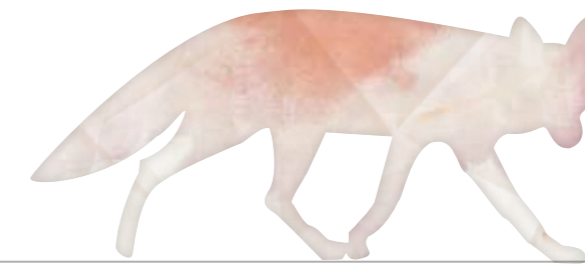
**DR CHRISTOPH HARTEBRODT**

- Accountancy Networks
- Economy of Forestry
- Management and Control
- Tools for Decision Support and Sustainability Management

### Dept. 8 | BIOMETRY & COMPUTER SCIENCE

**DR GERALD KÄNDLER**

- Forest Inventory and Management Planning
- Modelling; Dendrometry
- Statistics- and GIS-Consulting; Geodata Management
- Software Engineering
- Information- and GIS-Technology



## FACTS AND FIGURES

The Forest Research Institute (FVA) is a research institution attached to the Ministry of Rural Affairs and Consumer Protection of Baden-Württemberg and organizationally closely connected with the State Forest Service, ForstBW. According to the mission outlined in the State Forest Act (§ 76 LWaldG), the FVA examines the relationships between forest and environment and develops efficient ways for forestry and the timber industry to protect the commercial as well as the ecological and recreational functions of the forest. The research priorities of the FVA are formulated in the strategic plan for the period 2014-2018, as follows: 1) climate change research, 2) forest nature conservation, and 3) measurement and evaluation of sustainability.

The FVA is comprised of eight departments according to their responsibilities, and continues to be coordinated and managed by the Directorate (see organizational chart). An advisory board guides the FVA regarding substantive and strategic issues.

### 30%-women-quota on the advisory board exceeded

Since the Ministry of Rural Affairs and Consumer Protection appointed five new members for the Advisory Board at the beginning of 2014, three of them being female, the 30%-women-quota on the Board has been exceeded.

The new Board members are as follows:

- **Prof. Dr. Daniela Kleinschmit**, Albert-Ludwigs-University Freiburg
- **Prof. Dr. Barbara Koch**, Albert-Ludwigs-University Freiburg
- **Prof. Dr. Friederike Lang**, Albert-Ludwigs-University Freiburg
- **Dr. Peter Mayer**, Austrian Research Centre for Forests, Vienna
- **Felix Reining**, State Forest Service ForstBW

The following persons are in their second period of Advisory Board membership:

- **Prof. Dr. Jürgen Bauhus**, Albert-Ludwigs-University Freiburg
- **Dr. James Kirchner**, Swiss Federal Institute of Technology Zürich
- **Prof. Dr. Bernhard Möhring**, Georg-August-University Göttingen.

Membership on the Board is four years.

The duties of the Advisory Board include, among other things: the evaluation of overall development and orientation of the FVA, preparation of recommendations for the strategic orientation of future research priorities, and organization of specific research projects. The Advisory Board also evaluates individual projects in terms of practical relevance and scientific approach before the start of a project. ▶



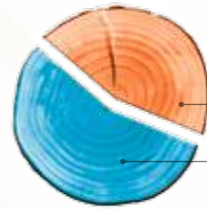
Advisory Board members (from left): Bernhard Möhring, Barbara Koch, Friederike Lang (front), Daniela Kleinschmit, Felix Reining, Peter Mayer, James Kirchner and Jürgen Bauhus





Total number of employees 2014:

245



117 female / 45%

128 male / 55%



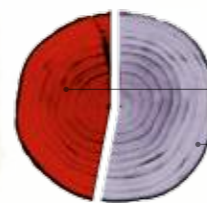
112 permanent / 46%

133 temporary / 54%



118 part-time / 48%

127 full-time / 52%



116 scientific / 47%

129 non-scientific / 53%



55 Research assistants / 22%

► The Advisory Board meets twice a year. The following persons also participate in Advisory Board meetings: Max Reger, State Forestry President, Chief Executive of ForstBW and Head of Department of Forestry in the Ministry of Rural Affairs and Consumer Protection; Bernhard Panknin, Head of Unit, Ministry of Rural Affairs and Consumer Protection, responsible for forest research; Prof. Konstantin von Teuffel, Director of the FVA; and Kristin Vollmar, Secretary of the Advisory Board.

### Research assistants – an essential part of scientific employees

The personal structures have changed very little since 2013. The total number of employees was 245 at the end of 2014 (at the end of 2013: 246), 55 percent of the employees were male (2013: 56 percent) and 45 percent female (2013: 44 percent). The ratio of temporary to permanent contracts remained constant at 54 percent to 46 percent. Also, the ratio of part-time to full-time employees did not change (48 percent/52 percent). The percentage of the scientific employees of the total number of employees decreased a little from 49 percent to 47 percent. The number of research assistants climbed to 55 (2013: 48) amounting to 47 percent of all scientific employees and 22 percent of all employees.

A total of 21 foreign employees from different countries were employed at the FVA in 2014.



Birthday congratulations: Eberhard Aldinger (left) and Konstantin von Teuffel



New Department leader: Ulrich Schraml



Official opening of the FVA Childcare Centre

### Invited to celebration

Konstantin von Teuffel - the Director of the FVA - celebrated his 60th birthday on the 2nd of February. Prior to becoming the director of the FVA he was the Head of the Unit of Silviculture, Forest Management Planning, Hunting and Forest Research at the Ministry of Rural Affairs in Stuttgart for six years. Without disregarding the main task of the FVA – that of practically orientated research - v. Teuffel realized the importance of networking in forest science research and took on important positions within various national and international organizations. He is also credited with remodeling a part of the ageing FVA-building using a new friendly motif and taking an important step forward towards creating a family-friendly FVA by opening a FVA Childcare Centre.

Also Eberhard Aldinger, the Deputy Director of the FVA, had a reason for a celebration: He had his 65th birthday on June 14th. Aldinger has been an employee at the FVA since 1989 and in 1993 became the leader of the Department of Phytology and Forest Site Science, which is now called the Department of Forest Nature Conservation. Aldinger has been Deputy Director since 2007.

### A new department-leader

After an almost one-year vacancy, the Department of Forests and Society has a new leader: Professor Dr. Ulrich Schraml joined the department at the begin-

ning of December 2014. He switched to the FVA from the Faculty of Environment and Natural Resources of Freiburg University, where he had been leading the Institute for Forest and Environment Politics. Schraml succeeds Thomas Waldenspuhl, who took a position at the Black Forest National park at the beginning of 2014.

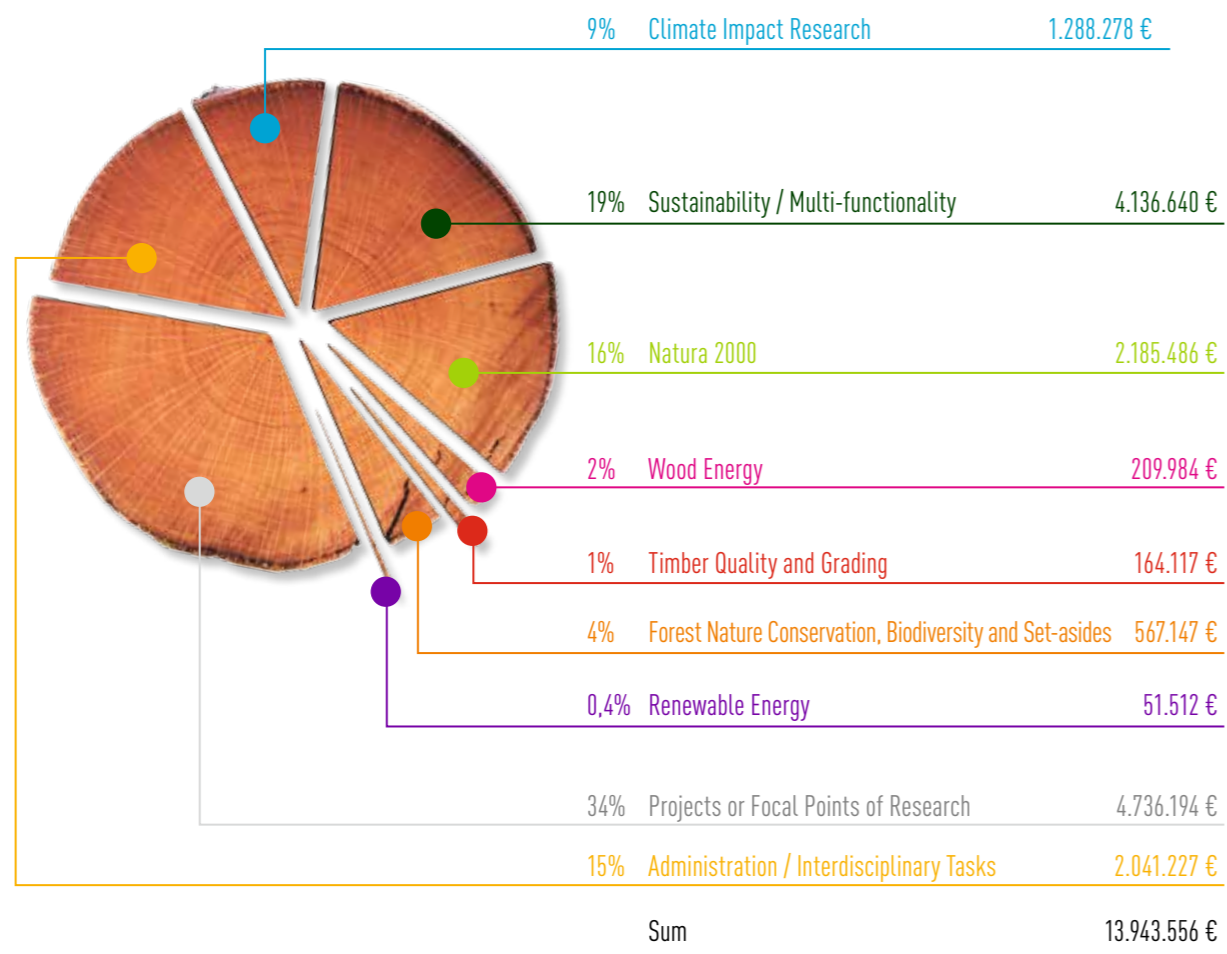
### FVA Childcare Centre honored

Together with the architectural office of harter + kanzler in Freiburg, the FVA was awarded a prize for its Childcare Centre. In the competition of the Architectural Office of Baden-Württemberg »Exemplary Building in Freiburg from 2006 to 2014« the FVA Childcare Centre was one of 21 buildings to be honored out of 95 nominated ones.

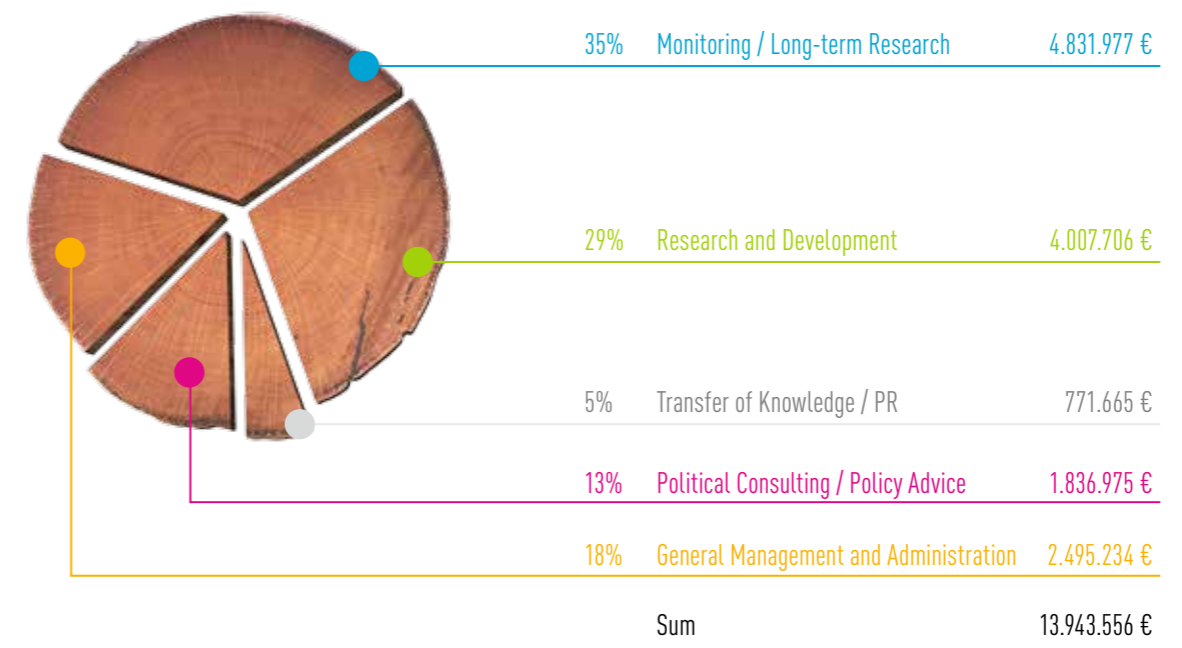
### Finances

The total budget of the FVA was about 14 million € in 2014: 85 percent of this was allocated to the research budget while nearly 15 percent was allocated to management and interdisciplinary activities. Personnel expenses amounted to € 8.2 million compared to € 5.7 million for supplies, equipment and other operating costs. External funding amounted to 13 percent of the overall budget. Twelve percent of the external funds came from the European Union while 52 percent came from the State and 36 percent came from other sources. The detailed use of resources is shown in the following graphs and tables.

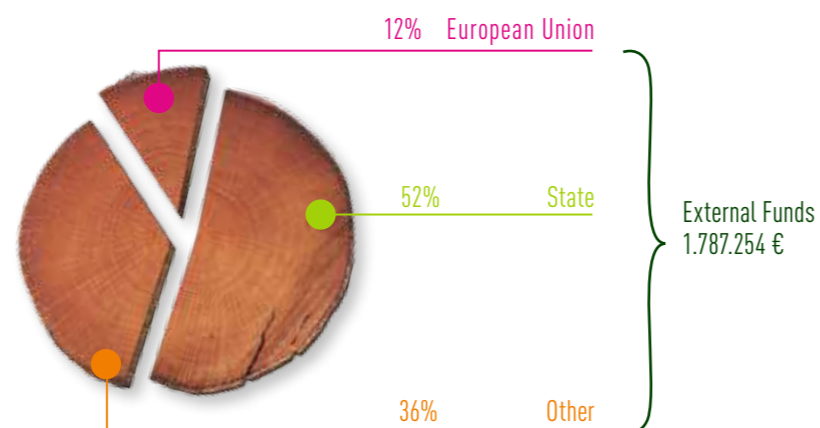
## Resources According to Focal Points of Research



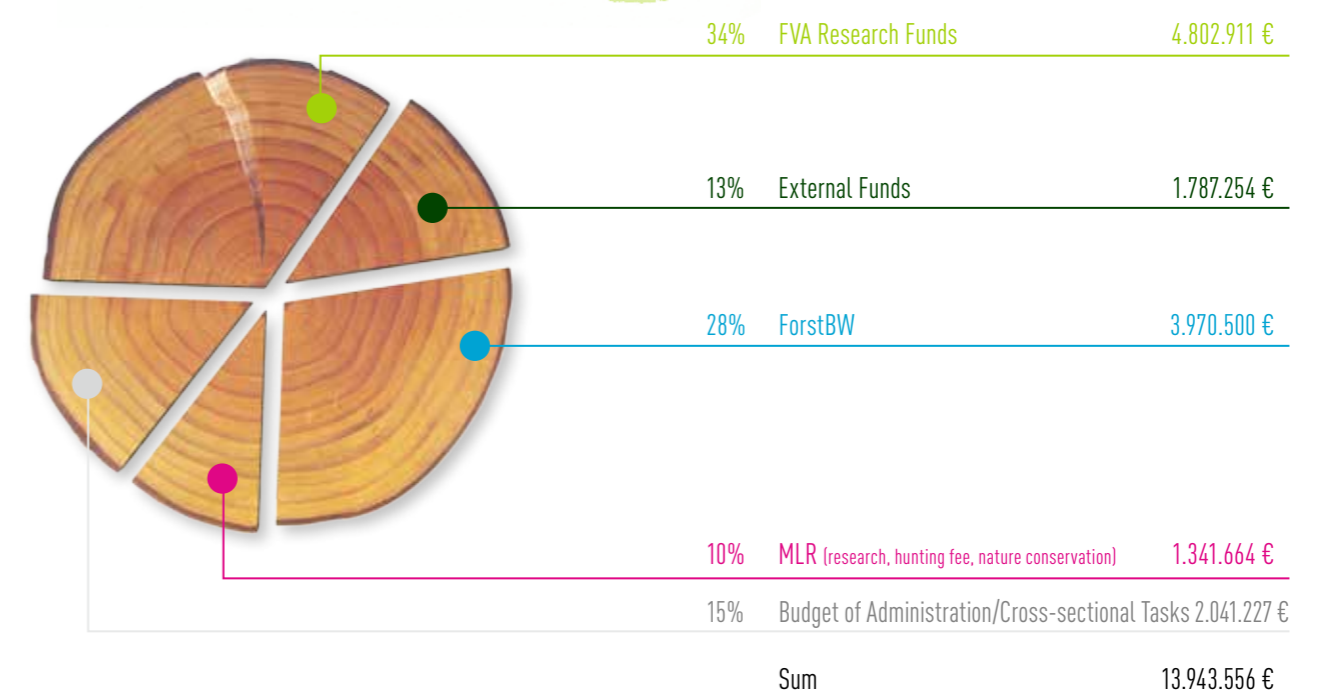
## Resources Based on Competency



## Resources Based on the Origin of Funds



## Resources Based on the Origin of Funds





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