

Current preparation of feasibility study for implementation of the Mira monitoring app in the Carpathian Biosphere Reserve

by Angela Dichte, Rakhiv 13.11.2015

The pressures on our ecosystems are growing enormously. Especially forests as one of the most complex and also valuable ecosystems are threatened from many sides. Therefore it is important to protect wilderness areas, where natural processes and functions are sustained and can further develop. These areas will not only serve as vital pools of biodiversity but also enable us to further study the dynamics and functioning of natural systems, which also might help us defining strategies for governing human needs as part of the earth system in a more sustainable way.

During a longer stay abroad in Australia I think I truly experienced wilderness first time. This felt so real and alive that not only because of its mostly aesthetical beauty my interest arose to spend more time in it and to learn more about it. So here I am, studying International Forest Ecosystem Management (BSc) at the University for Sustainable Development Eberswalde (HNEE) in Germany.

My study course implicates a practical study semester abroad, which I decided to spend in the

Carpathian Biosphere Reserve (CBR) in Ukraine during this autumn and winter on behalf of the Centre for Ecomics and Ecosystem Management (CEEM) and supervised by Prof. Dr. Pierre Ibisch. In June 2014 it was the first time I visited the Biosphere Reserve in the course of an annual excursion organized by my university. The fascination for this region with its valuable natural richness and colourful and lively traditions was growing since then. This was also the time when I first got in touch with the Mira app. Through various projects I became more and more involved in the app's development and training practices. Therefore it was just logical to combine both. Luckily when proposing the offer to the CBR a big interest was and still is shown. I am very grateful for the support that I am receiving here from many sites. Especially regarding the tough times and the far from perfect working conditions everyone has to deal with in the CBR I really appreciate everyone who gets him- or herself into the topic and acknowledges the high potential and resulting opportunities the methodology combined with supporting technology can offer.



Figure 1: Group picture of our last student excursion in June 2015 at Geographical Centre of Europe, close to Rakhiv.
by Christoph Nowicki.

Building on a ten-year-old cooperation between CBR and HNEE and a former project carried out 5 years ago by both partners that developed strategies for a proactive management of the CBR [Ibisch et al. 2011], we are now detecting the feasibility of implementing the *Mira monitoring app* to further enhance monitoring activities and results in the CBR. Since this monitoring app is based on the same methodology and supporting software programme that was already introduced in the course of the project 5 years ago, the current work also creates the side effect of reviving the

process and results of the earlier project and putting it back on the agenda.

The used framework methodology are the *Open Standards for the Practice of Conservation* developed by CMP (*Conservation Measures Partnership*), which emphasizes a strategic, result-based process that is continuously monitored and adapted to change and new insights. Based on the Open Standards, the *Miradi™* software was developed to lead conservation practitioners with a step by step assistance through the process.

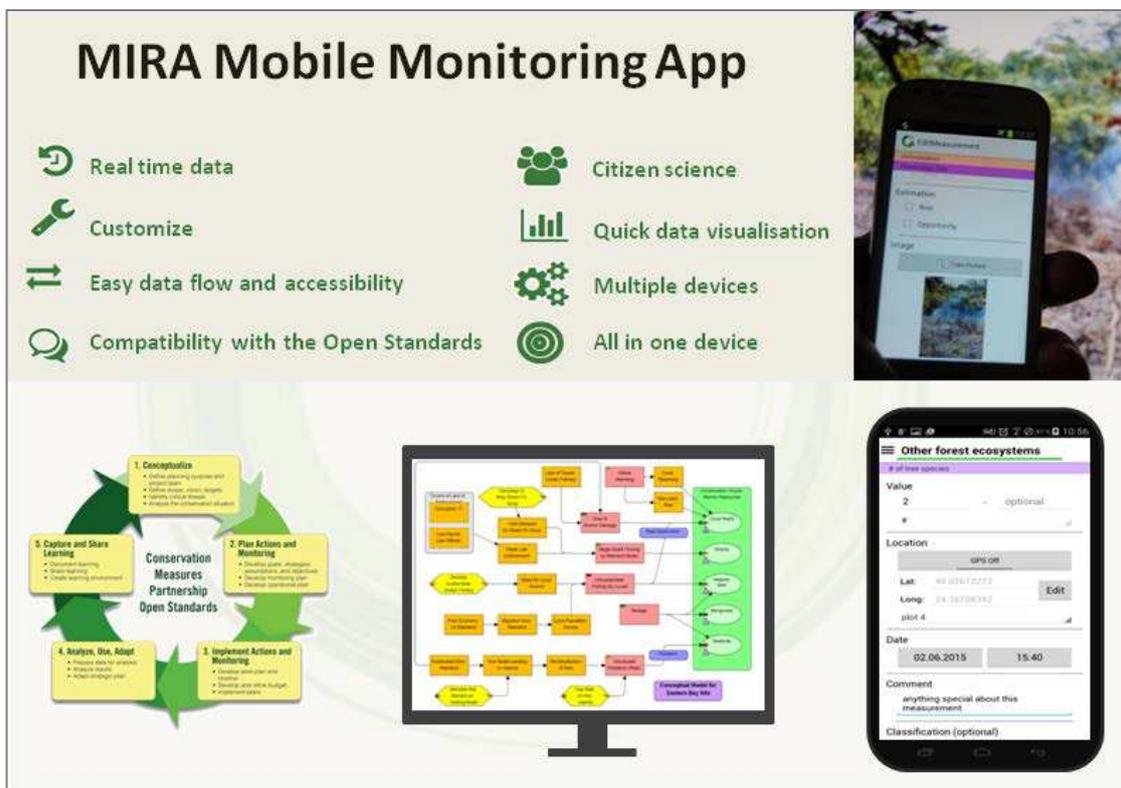


Figure 2 : The MIRA monitoring application. Bottom: Open Standards process circle and a conceptual model in Miradi

As monitoring, not only of the biodiversity targets' state but also of potential risks and the project's progress, is on one hand seen as an essential part in the process of adaptive management, but on the other hand often put in second place in many projects, the need for new techniques of easy and systematic field monitoring became obvious. Therefore Laura Geiger as a former student of the HNEE and associate of the CEEM in cooperation with WWF UK created the Mira app. This app is still developing and is currently tested in pilot projects for example in Guatemala and Kenya, as well as in some student projects. The app allows to record

information for user-defined indicators on a simple Android smart phone or tablet without the need for internet connection. Each record will include measurement values, GPS coordinates, date and time, photos and comments, as well as additional attributes as required by the project. The recorded data can be easily synchronized back into the *Miradi™* project. Additionally a server component and web interface was created that allows an even easier synchronization process as well as access and parallel processing of project information via internet. This is a big enhancement especially for big organizations like the CBR.

Regarding my actual task of preparing a feasibility study for the implementation of the MIRA app in the CBR, I started with getting an overview of the existing monitoring structure and organization mainly by personal interviews that I conducted with different departments and laboratories. My main specialist contact person here at the CBR is [Yaroslav Dovhanych](#) which is not only linguistically caused but also owed to his ongoing dedication for the implementation of the Open Standards in the CBR. He already rendered to translate the software programmes. Together we conducted small workshops to present methodology and software products and kicking off discussions about the implementation as well as defining some first useful indicators. In some cases we were even able to do a little test run with some participants. These meetings and discussions were fairly fruitful. Big interest was shown and strong arguments for the implementation came up, but also some challenges were highlighted, which need to be addressed for a successful realization of the project. Of course the



Figure 3 : Prof. Ibisch, a group of students during a practical lecture with Mira app in Barnim Nature Park, north of Berlin, Germany. June 2015. by Angela Dichte

Figure 4 : Representatives of all departments and laboratories of CBR, which Angela is currently working with. November 2015. by Angela Dichte

most obvious requirement is the funding of mobile devices, but there are a few more obstacles to negotiate. These findings and results will be presented and discussed in a followup.

During the next weeks some field trips are planned to find options organizing specific scientific research with the help of Mira app. Here we currently concentrate on bat monitoring in caves and artificial galleries.

Furthermore the monitoring of bigger mammals is in preparation too. Right now I am just realising the importance of a well-guided project creation with focusing on set definitions and well-conceived, precise goals to not get lost in random sampling again but to reach the goal of systematic and effective project monitoring and management. This is my personal big challenge right now but also most likely an ongoing one for me as well as for many other projects too.

Literature:

Ibisch, P.L., J. Geyer, L. Schmidt, V. Pokynchereda & V. Gubko (2011). Carpathian Biosphere Reserve: challenges and solutions for protected area management in Ukrainian Transcarpathia. Shaker: Aachen. 242 p.

(<http://www.shaker.de/de/content/catalogue/index.asp?lang=de&ID=8&ISBN=978-3-8440-0178-5>)



Followup of the feasibility study report

by Angela Dichte, Eberswalde, 08.02.2016

Now I am back in Eberswalde, Germany and the feasibility study is finished and forwarded to the potential sponsor. So I would like to summarize the main results in this article.

The ecological and the threat monitoring of the CBR are performed through a system of permanent observation plots by scientists and enriched by observations of field inspectors. Both monitoring systems differ fundamentally in methodology and outcome quality and therefore needed to be regarded separately.

Field inspectors are almost daily on-side in their subdivisions, which are spatially defined areas inside the CBR. This enables the observation of random events and phenomena next to the general tasks of reporting criminal acts or the destruction of infrastructure be it human caused or by natural hazards as floods, as well as recording garbage dumpings and forest fires. Furthermore the field inspectors have the task of recording visitor movements and numbers. Observations are recorded via diary entries which are handed in yearly. The most interesting entries, from the inspector's view, get transferred on special cards, with all required information listed, and handed in to the chief of inspector (one per division) monthly. The data recording accomplished by the inspectors is characterized by random sampling and therefore weak scientific significance also due to the subjective nature of recording-when-observed and the resulting high variety of the amount and quality of data. But based on the high number of inspectors and their almost continuous observation of rather small areas, the possibility to keep track of the overall situation and its development can be seen as of great value and important additional information to the scientific work.

A more strategic monitoring focusing on specific species, habitats or phenomena is performed by the scientists. It ranges from scientific research that is rather project or research question related with focused monitoring, which is rather of short duration, until surveillance monitoring building on a more or less long history. The current knowledge transfer from the

scientific departments towards the conservation management is constituted by the Scientific Technical Council that gathers twice a year. This is the possibility for the scientific body to give recommendations to the management.

The link between monitoring and evaluation processes and decision making processes is personnel and temporal gaping. It is recommended to enhance this situation. A mutual project that is always accessible by each team member and the constant feedback through data delivery could be a chance to support communication and decision-making ability. Furthermore the decoupling of conservation decision making and biodiversity monitoring yields in surveillance monitoring that is seen as inefficient and not appropriate for adaptive management approaches. Efficient decision making in and for complex systems should be based on detailed a priori hypothesis definition and associated models of system responses to management actions followed by their testing through targeted monitoring [Nichols & Williams 2006]. Currently, targeted monitoring is only found rarely in the CBR. The large employee base and the comprehensive scientific research could be seen as a valuable potential and advantage of the CBR but focus and management need to be organized more strategic and efficient. Collaboration of science and protection departments should be enhanced.

Regarding the compatibility of the current monitoring and the Mira App structure, the observed inspector monitoring seems to be appropriate. The current recording via diary entries is very comparable to the measurement recording in Mira App in terms of recorded information and overall structure. It appears to be more difficult to transform the expert monitoring of the scientific department since it is very diverse, and with a very detailed information need. For scientific research it needs to be checked if and how Mira App is helpful to collect the needed data in every individual case. During the two exemplary project works it was experienced that the work is quite time-consuming.

Aspired benefits through the implementation of the Open Standards and the Mira App can be summed up by the statement that the orientation towards a more adaptive management approach will improve the sustainability of the CBR work and consequently of the regional development as well. More specifically, it will enhance the cooperation between the various departments of the CBR due to the mutual project work and subsequently through the availability of the recorded data from each department. Data accessibility and management will be easier and more efficient since the data is already recorded digitally and does not require any handling of paper work. Furthermore the data will be most likely more trustfully, comprehensive and therefore more valuable and significant for evaluation processes since the automatic GPS and time recording can also serve as a control tool for fake observations. The transparent definition of monitored indicators and the easy data accessibility will be an important improvement for future investigators and management as well as for any control purposes by the ministry.

The Open Standards methodology supports the development of hypothesis and of associated system response models to management actions through the creation of result chains. If this effort would get emphasized during the project, more targeted monitoring will be possible instead of the rather inefficient surveillance monitoring. Furthermore well-founded priority setting, as one key element of the Open Standards, is rather weakly developed in the CBR so far and would get improvement through the project work. The realization of the Open Standards and the use of Miradi™ would get supported by the efficient data gathering with the help of the Mira App and hence would receive a stronger connection to reality. Therefore the strengthening of the monitoring actions can reinforce the whole process circle of the Open Standards. Also, stakeholder involvement, as an essential element of the Open Standards and as one of the main characteristics of biosphere reserves, would get revived and strengthened again. This will reinforce the role of the CBR as an engine for sustainable development in the region.

For now the main challenge is to find financial support to be able to provide appropriate equipment.

For a successful and consistent implementation of the methodology and the use of the Mira App, it would be necessary to provide mobile devices to each field inspector, as the main future App users, as well as to each master inspector, assistant of chief of inspectors and each chief of inspectors, and furthermore, each scientific department with at least one mobile device for their use. For the synchronization of recorded data, internet connection via Wi-Fi is needed. Therefore it would be advantageous if every division office would have a Wi-Fi internet connection available, which by now is not the case.

A shortage of financial means is evident everywhere throughout the CBR. Generally, the provision of work equipment is not ensured sufficiently. It is lacking on many sides, from petrol for field trip excursions to pheromones for bug monitoring via office computers through to not least sound and warm working clothes for the field inspectors. Additionally, the already small wages were even more lowered by amount whereas the inflation increases the daily expenses. This on the one hand is not supporting the employee's motivation, and furthermore, it reveals that there is definitely no financial scope that allows even to think of the implementation of the Mira App in the CBR by their own financial effort.

It can be concluded that the implementation of the Open Standards methodology and the Mira monitoring software in the CBR work can be seen of high value with significant potential for a more adaptive, inclusive and strategic management of the CBR. The main obstacles were located in efficient communication due to a very large and diverse workforce that has to be addressed and involved during the project process and due to the language barrier. These challenges should be managed through proper pre-planning and a generous time-schedule. During the study survey, a high motivation and recognition of the technological potential was observed, which will be the basis for a successful project.

Literature:

Nichols, J.D., B.K. Williams (2006). Monitoring for Conservation. In "TRENDS in Ecology and Evolution" Vol.21 No.12. Elsevier. ISSN: 0169-5347. DOI:10.1016/j.tree.2006.08.007