

Daily report of the 19.09.2012

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Excursion to Sumava Mountains, Czech republic

At 9.40 am we arrived at Kvilda, Czech Republic, a village located close to the border to Germany (and therefore to the Bavarian forest) where we met our guide. She explained some background information about the national park: It is located on 1000 meters above sea level. There are 3 kinds of forests: natural spruce forest, unnatural spruce forest and mountain mixed forest. It contains no water reservoirs and is separated in managed and unmanaged spots.

Here you can see the map of this region and the route we walked on this day.



Picture 1: Map of the Sumava area

On our first stop we saw two different types of bark beetle traps. There are black boxes that collect the beetles (picture 2), which are used for monitoring and killing of beetles. If used as a wall they can even prevent the beetles to invade new territory (or at least lower the amount of migrating individuals). The others are wooden tripods coated with poison (picture 3). Both trap types use pheromones to attract the beetles. We think it's disputable to use the wooden

traps because the poison also kills other animals directly or indirectly by feeding on the dead animals. Also it may be washed into the soil.
There were also some mountain ashes surrounded by fences showing the human interaction to restore the forest (picture 4).



Picture 2: bark beetle traps



Picture 3: poison traps



Picture 4: mountain ash surrounded by fences

Our next stop was near a stack of wood (picture 5). On some wood the foresters cut off the bark, because there were beetles in it. On the rest the beetles already left the tree. This is a method used in managed forests to decimate the amount of bark beetles.



Picture 5: stack of wood

We also saw red stripes on the trees (picture 6) marking the border between first and second zone of the forest (first zone is unmanaged, second zone is managed). At Sumava National Park are many small first zones surrounded by large second zones.



Picture 6: red mark on tree

Then we arrived at the ancient army zone border. Due to the iron curtain no civil person was allowed to cross it, leading to a big area of untouched forest.

Later the guide showed us a place without dead wood near a place with dead wood (picture 7). The dead wood protects the trees of the red deer. The red deer prefers eating bark of the mountain ash, therefore in the spot without dead wood we saw no ash.

The deer is a problem in this area, because in winter it finds nothing to feed but the bark, leading to immense damage on trees and migration of deer to lower areas. Lower areas are usually managed by foresters that shoot the deer to keep their trees alive. The National Park managers decided to feed the deer in winter and to control population by shooting to prevent the migration.



Picture 7: place with dead wood and regenerating flora

Then we saw the effects of the storm destruction and beetle attack in 2007. The whole landscape was filled with fallen trees (picture 8). The first generation of beetles used them to procreate, the second generation migrated to the still standing trees, which were damaged on the roots by the storm. The park managers had to make a choice: move the fallen trees with big machines and destructing the soil or let nature cure itself. They decided not to intervene.

The bark beetle outbreaks stopped and now the discussion appears if it was the better decision.



Picture 8: slope with dead trees

We also visited the official spring of Vltava river.

After this we stopped at a place where we could compare an area with non-intervention way of protection after wind-throw and an area with the intervention way. On the right side of the path we could see the natural forest which was clustered and contained dead wood. There was no high density and we had a mix of Sorbus and Spruce. At the ground we remark old trees and grasses which showed us that this was the area without intervention. On the left side we could see a cultivated spruce forest without any dead wood or mixed trees (picture 9).



Picture 9: managed and unmanaged forest in comparison

Later we crossed the border to Germany and reached the highest point with a good overview. On the Bavarian side, we have a high diversity. There were ash, grasses and some old trees in hotspots. On this side are also many villages. On the Czech side we have a low diversity: a high density of spruce in large areas.

Then we went deeper down to where once was farmers land: crops, hay and grasslands. Today there is a mixed forest. Due to the agricultural removal of biomass there is a poor soil with low nutrient content.

Then we arrived at a hut near a graveyard (picture 10). The hut has been rebuilt for tourism. The people that were living there had been invited by the landowner in the 18th century to live and work, but have been sent to Germany after the war due to their German roots. In the 70s here was a military base located, but it also isn't existing any more.



Picture 10: rebuilt hut

Now we came to a field of secondary grassland (picture 11), that was partly managed by agriculturists in the old days. Also some people digged for peat for heating.



Picture 11: secondary grassland

We visited the lowest part of the outer forest where moss and hammocks and hallows are located. We also saw many sedges.

The guide explained the damage on trees caused by deer and woodpecker. It can affect up to 100% of the trees in an area and makes the trees highly vulnerable to fungi and beetles.

We reached a managed forest with more beeches and maples. The whole wood is used as firewood, because there is a lack of firewood in the area. By this heavy forest use the nutrients are taken out of the forest leading to a poorer soil.

In the evening students held a seminar about

The Presentation - Natural development and regeneration of a Central European montane spruce forest, Miroslav Svoboda, Shawn Fraver, Pavel Janda, Radek Bače, Jitka Zenáhlíková (Forest Ecology and Management 260 (2010) 707–714)

- about the scientific research in Sumava mountains focusing on the past events and conditions influencing the forest
- aim: reconstruct the disturbance history, Assessment of the role of density dependent mortality in shaping current forest structure, Evaluation of seedling substrate

preferences

- they used the historical data and dendrochronology for reconstructing the history events
 - there were wind-throw (1868), bark beetle outbreak (1870), following cutting, and barkbeetle outbreak
 - the dendrochronological data clearly show increasing growth after wind-throw, barkbeetle outbreaks, and salvage logging
 - Dendrochronology – they took a cores, measured the rings width, after that they did a cross dating –
(<http://www.ltrr.arizona.edu/skeletonplot/exampleapplication.htm>) that means that they put together more chronology (tree rings) curves into one „in the right way“. After this they used the method “boundary line” which is used to find disturbance events in the past in that way that the methods find some unexpected bigger growth (wider rings for some longer period).
- for searching density dependent mortality they measured position of all alive trees (bigger than some smallest ones) and all dead wood -> they obtained spatial pattern of the forest in which they recognized that the structure is vertically homogeneous, but horizontally heterogeneous and patchy which is also connected with dependent mortality and also has an important role in shaping new forest (but now I am not really sure what they wrote there about the dependent mortality, how much significant results they found..)
- They found very big regeneration (seedlings (<20cm height) – 42 781 ha⁻¹, saplings (>20cm) – 11 807 ha⁻¹) and what is really important: they found that most of regeneration is going on dead wood (Sapling 50-80%, seedlings 35-75%) even though that the dead wood substrate covered only 4-9 % of plots area. So that means that dead wood is very very very important for regeneration in these forests :).
- They also recognize that Densities significantly decrease with the increasing height
- Conclusions:
 - back to the dead wood:) : Non innervation caused enough dead wood (substrate) -> Much faster regeneration, Slow regeneration can mean that there is not enough dead wood
 - Semi-natural forests is very valuable – somewhere can be big biodiversity etc. -> protection
 - Infrequent moderate or small disturbances diversify the stand and enhance the structure
 - that means that the forest is more resistant against disturbance and more diversified
 - also is important that understanding to the disturbance regime is very important for understanding how protect these forests and also how grow the cultural spruce forests