

# Effects of land use on the water regime – Best practice drinking water protection in Danube catchments

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## Forest management to protect drinking water resources

In order to guarantee a sustained provision of water protection functionality of forest ecosystems, silviculture has to adapt to this overall purpose. In the project CAMARO-D a catalogue of Best Management Practices was elaborated for forest management in drinking water protected areas (DWPA).

**Study site:** Groundwater field Steyr, Upper Austria

**Risk potentials water pollution:** Forest ecosystem destabilisation caused by bark-beetle infestations. Norway spruce (*Picea abies*) plantations are facing die-back, wind-throw occurred frequently.

**Methods and interventions:** Application of the *Forest Hydrotope Model (FoHyM)* to establish stable & resilient forest stands.

**Preliminary results:** Plantation of oak (*Quercus robur*) and further site-adapted tree species (FoHyM-results) to stabilise the forest ecosystem.

## Mountain grassland management towards groundwater protection

Karstic mountain ranges have the characteristic of being extremely permeable to water. Due to preferential water flow paths, sinkholes and the typical soil types, harmful substances contained in the water cannot be removed during percolation. The substances can be discharged directly into the groundwater. Best Management Practices to tackle this situation were elaborated.

**Study sites:** Catchment areas Vienna Water (Rax, Schneealpe), Styrian Enns valley (alpine pastures)

**Risk potentials water pollution:** Surface water inflow into dolines or sinkholes during strong precipitation events, intensive grazing, land abandonment, insufficient storage capacity, contamination of groundwater resources (turbidity and microbial inputs), erosion due to land use activities (ski slopes), natural events (heavy rainfall).

**Methods and interventions:** Grazing management of livestock - paddock pasture, adaption of livestock to water supply, biological sewage treatment plants, foil ponds, closed and stable vegetation cover (autochthonous vegetation).

**Preliminary results:** site adapted measures (grazing management paddock pasture), Training Programme Alpine Farming 2018/ 2019

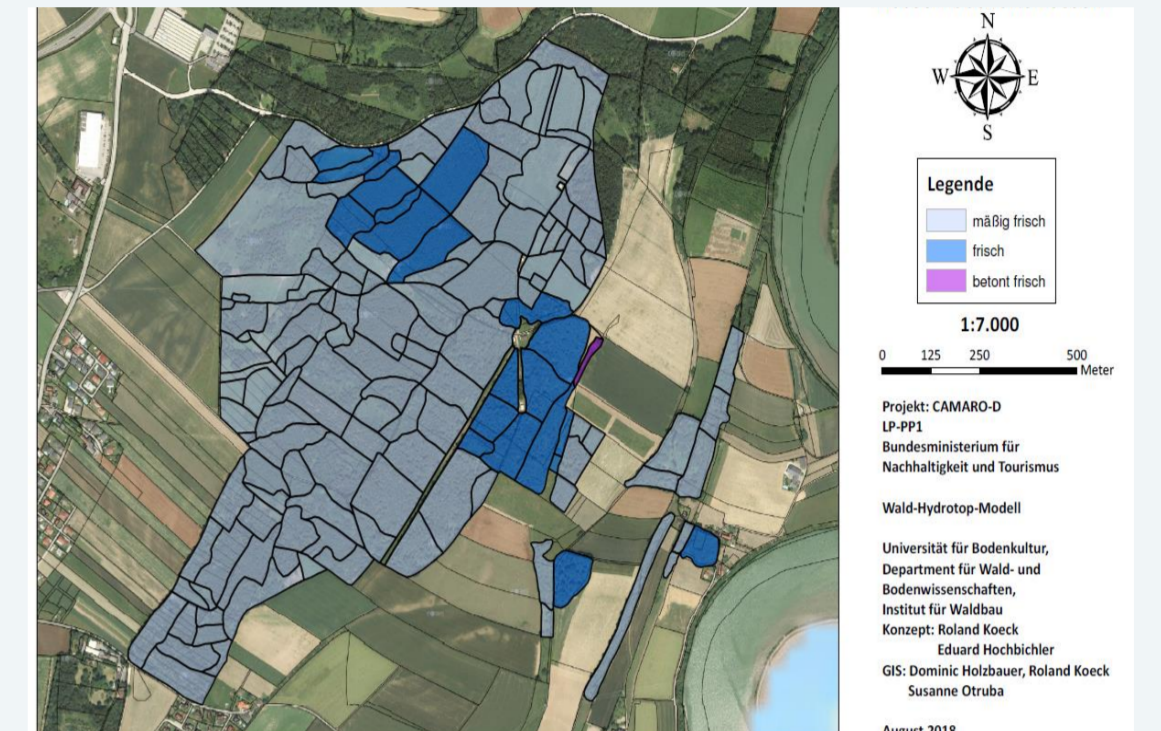


Fig.1: Forest Hydrotope Map, thematic layer "Water Regime Class" for the DWPZ part Steyr.



Pict. 1: Stable oak trees (*Quercus robur*) at the edge between forest and arable land in the DWPZ.

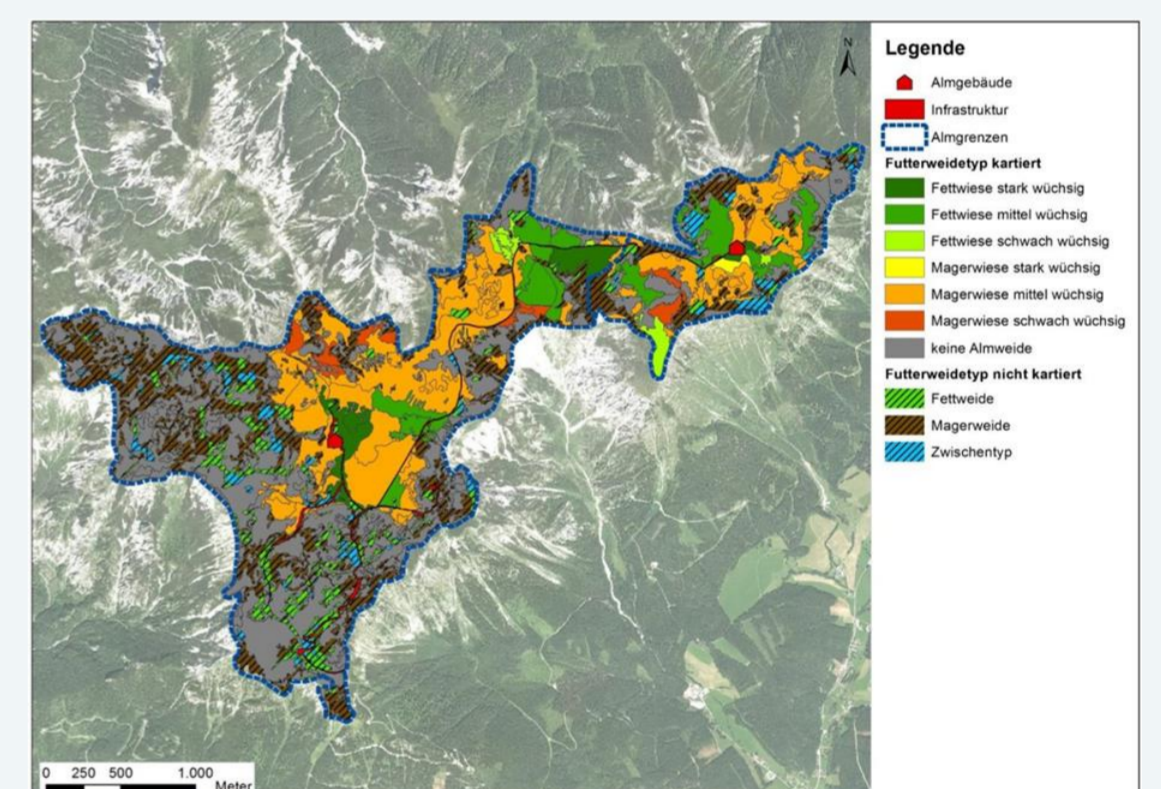
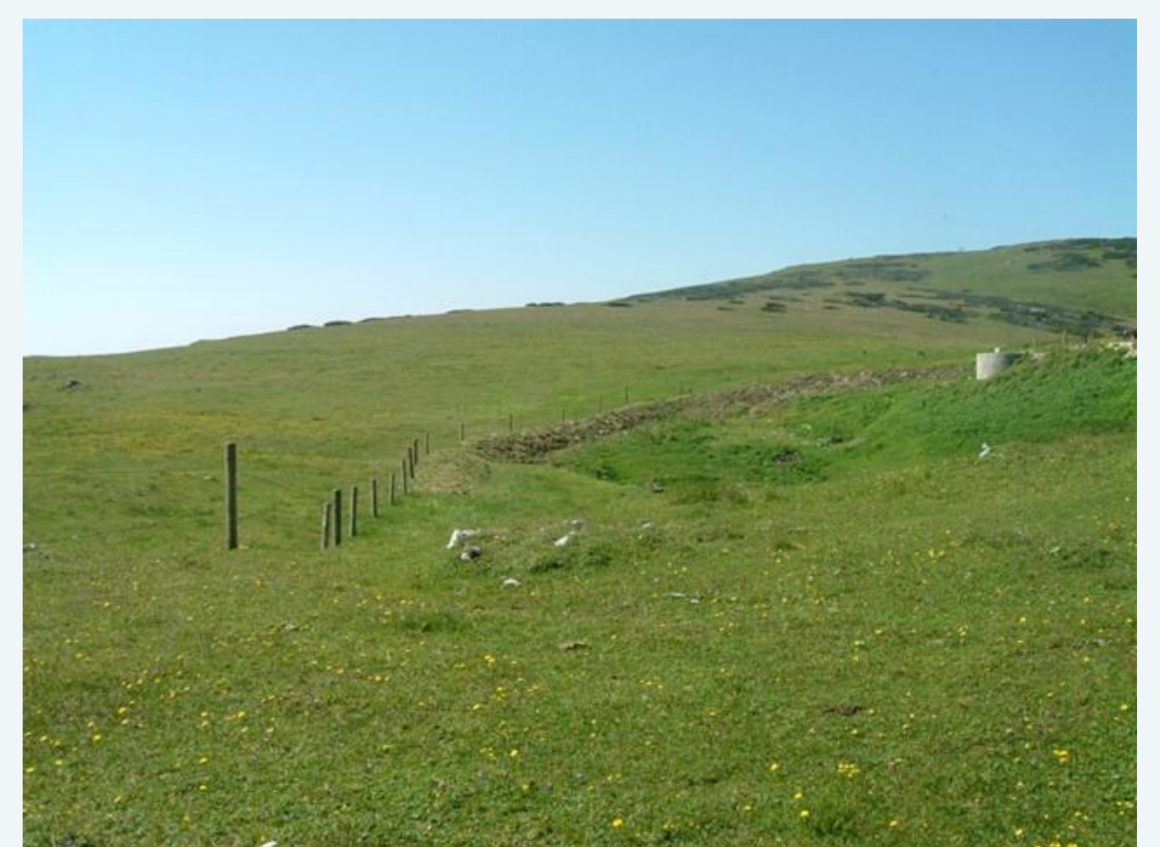


Figure 2: Map regarding grassland quality; alpine pasture Mount Schneealpe; Egger, G., Muth S., Dubbert M. 2017



Pict. 2: Fencing of doline, embankments uphill; Schneealpe



Pict.3: Alpine pasture Nat. Park Gesäuse, Blaschka, 2018