DAPHNE
Inštitút
aplikovanej
ekológie

# Management model for alkaline fens

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Management Models for Natura 2000 sites was a project launched by the European Commission in January 2007. It aimed at the elaboration of management models for 25 habitat types included in annex I of the Habitat Directive (92/43/EEC) that need active recurring management.

# HABITAT 7230

*Caricion davallianae* is a community of open low-growing small sedge vegetation. It is characterised by
- an usually prominent "brown moss" carpet formed by Campylium stellatum, *Drepanocladus cossonii, Cratoneuron commutatum, Caliergonella cuspidata, Ctenidium molluscum* etc,
- a grasslike growth of *Schoenus nigricans, S. ferrugineus, Eriophorum latifolium, Carex davalliana, C. flava, C. lepidocarpa, C. hostiana, C. panicea, Juncus subnodulosus, Trichophorum cespitosum, Eleocharis quinqueflora*, and
- a very rich herbaceous flora

# ECOLOGY

Alkaline fens are mires of small sedge and brown moss communities on soils permanently waterlogged, with a calcareous water supply, minimal fluctuations in the water level and with peat or tufa formation.

Groundwater is rich in base cations (principally calcium, but also magnesium and potassium), but poor in nutrients (nitrogen and phosphorus).

# SPECIES THAT DEPEND ON HABITAT

*Maculinea nausithous* is associated with habitats transitional into fen meadows

Host plant is *Sanquisorba officinalis*

Larvae are found at *Myrmica* ant nests

Recommended mowing in mosaics before imago flight which is 15 June

# THREATS – DRAINAGE

- sensitive to changes in hydrology and hydrochemistry
- draining increases the loss of groundwater, leading to:

- reduction and compression of the existing peat
- inflow from alternative water resources (precipitation or surface water), at least in times of water shortage, and this may cause acidification or eutrophication and is likely to increase the degree of fluctuation in the water table
- if the process of refilling from other water sources cannot compensate for the reduction in groundwater, leading to the desiccation and mineralisation of the peat

# Deterioration of the sites

## Močiar Nature Reserve

**27.4.2005**

**3. 4. 2006**

Photo: Daniel Dítě

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## THREATS - EUTROPHICATION

- lead to an increase in the availability of phosphates and nitrates

- decrease or disappearance of species with weak competitive capability and low ecological amplitude

- invasion by, or increase of, ubiquitous and nitrophilous species with strong competitive capability and, often, with broad ecological amplitude

# Vegetation changes

1986 *Primula farinosa*

2005

## THREAT - abandonment, lack of regular management

- mowing and moderate grazing is usual traditional management on fen grasslands over the Europe
- traditional management disappears – fen grasslands are overgrown by expansive grasses and later by trees and shrubs
- loss of biodiversity

# ACTIVE MANAGEMENT

Mowing is carried out with light, usually small, machinery adapted to the sensitive fen environment, such as pedestrian-driven mowers. Tyres are frequently specifically adapted (low pressure, twinned wheels). Cut biomass is then gathered and removed from the site.

Suitable interval - once every 1-2 years

Minimal interval - once every 3-5 years

Very important is timing (spring or beginning of summer). Most of the food reserves produced during that season are removed in the aerial portion of the plant, reducing the plant's vigour.

# ACTIVE MANAGEMENT

Moderate grazing on fens can be recommended as an alternative conservation strategy to mowing, but a reduction in species variety and changes in species composition and species traits may occur.

In Scotland, fens should be accessible to stock during the driest months of the summer. They should be grazed for at least two weeks each year.

# ACTIVE MANAGEMENT

- ✓ mowing every year between 15th July and 30th September;
- ✓ an obligation not to mow more than 50% of the area in any year, and alternating the areas mown; mowing of the whole area is allowed only once every 2 year;
- ✓ mowing height 5-15 cm;
- ✓ mowing technique: in a manner which prevents the destruction of the plant and soil structure, and a ban on circular mowing from the outside towards the inside of an agricultural plot;
- ✓ the obligation to remove or stack the cut biomass within no more than 2 weeks after mowing (except in justified cases);
- ✓ prohibition on fertilizing and grazing

# RESTORATION MANAGEMENT

## Scrub and wood removal

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## Scrub and wood removal
## Burning versus wood chipping machine

# RESTORATION MANAGEMENT

## Mulching

# RESTORATION MANAGEMENT
## Mowing

# RESTORATION MANAGEMENT
## Mulching

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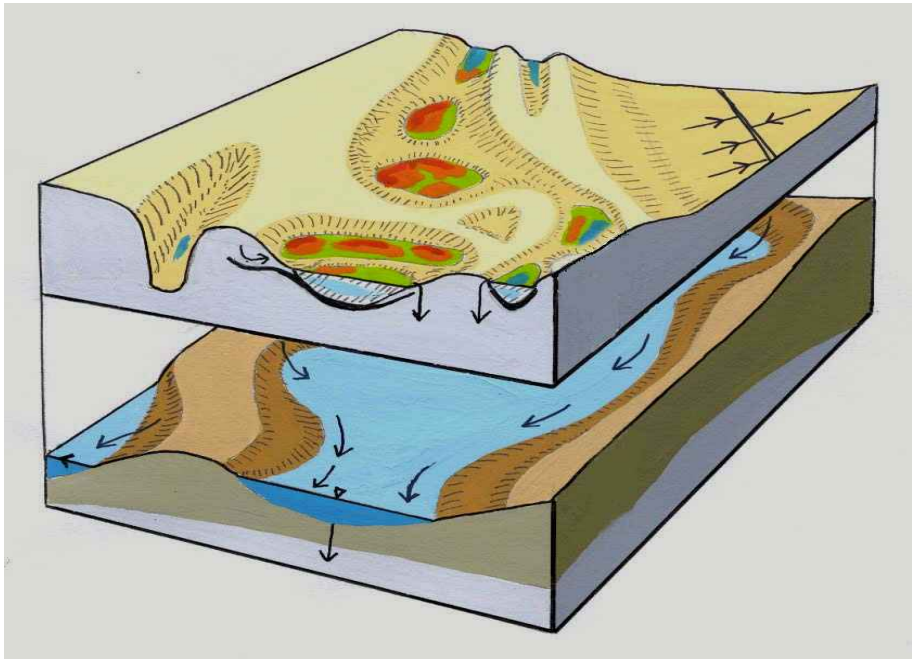
# Restoration of hydrology

## Hydrological research is important pre-condition

## It is important to understand how the system works

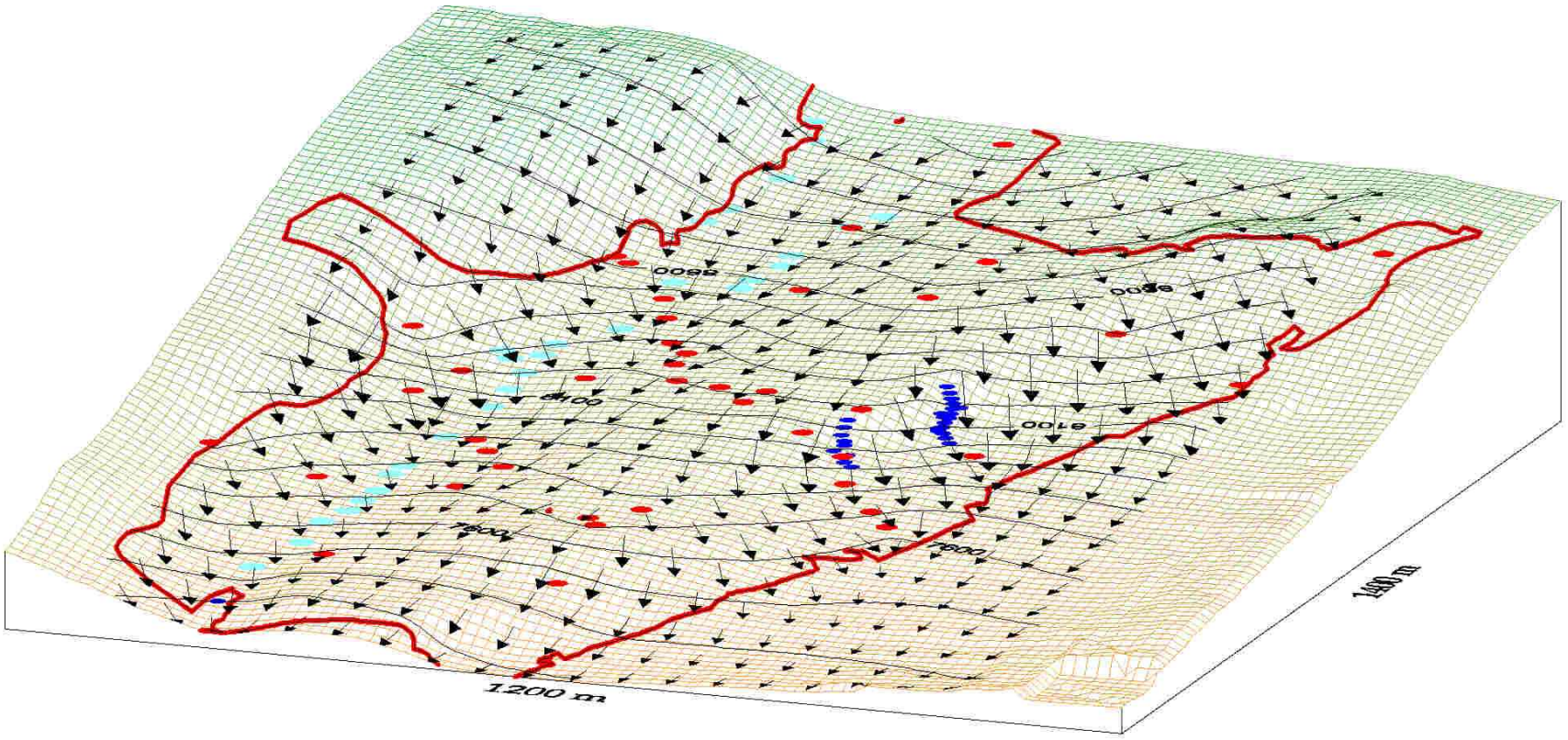
# Why to investigate water (quality and quantity) in peatland?

- Underground water has very significant meaning for life of fens.
- Restoration and management is always connected to manipulation with water regime.



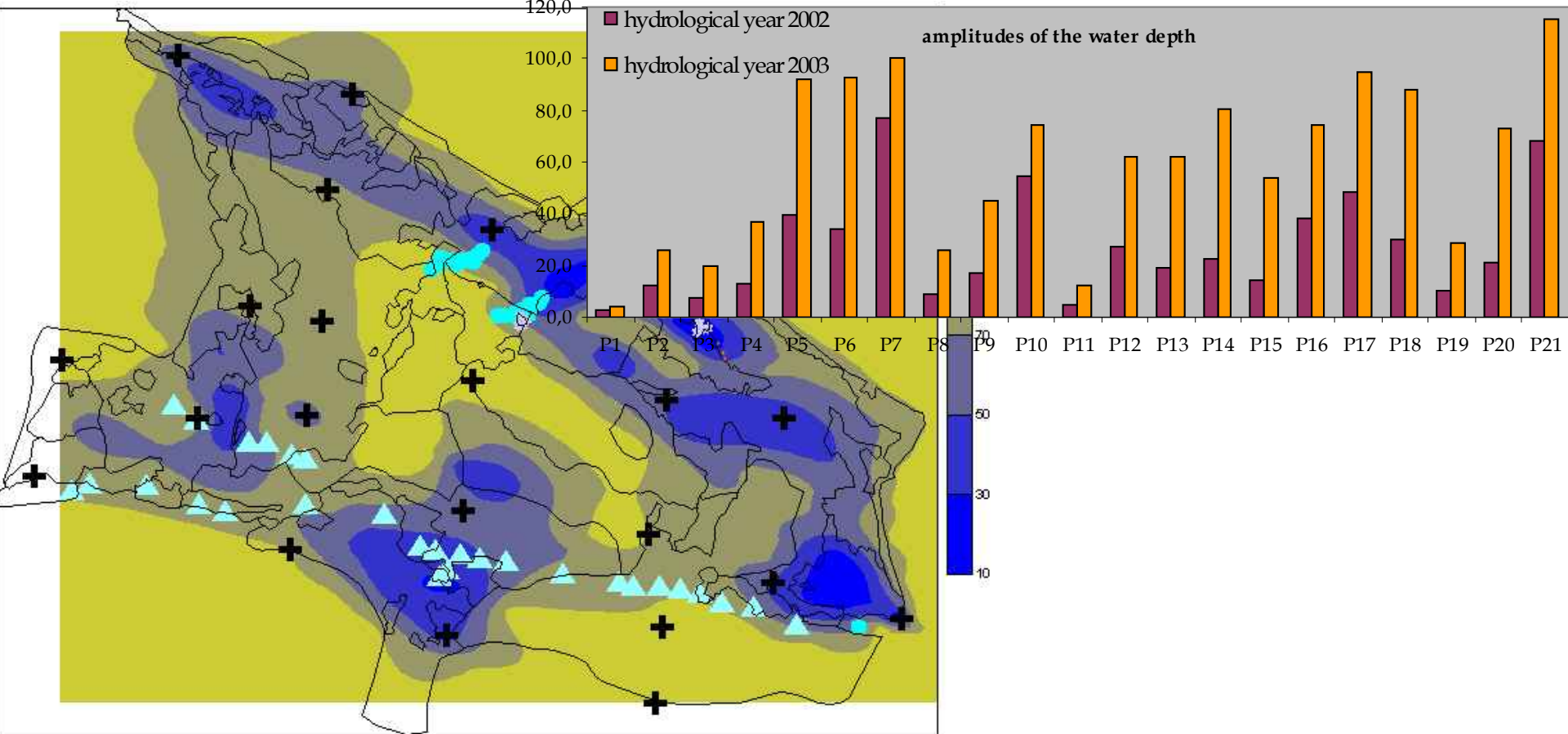
# To understand water regime we have to know:

- Direction of underground water flow (slope of underground water level is not the same with the slope of locality)



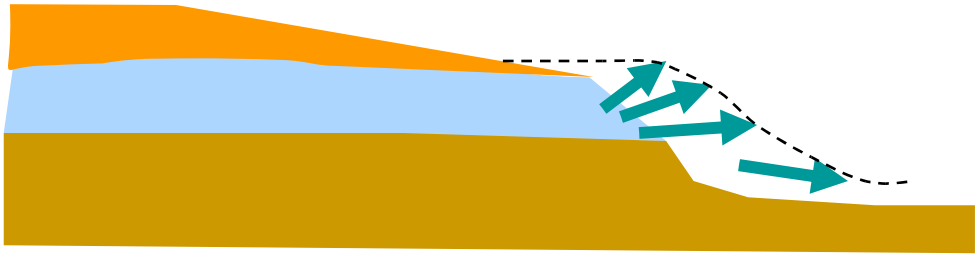
# To understand water regime we have to know:

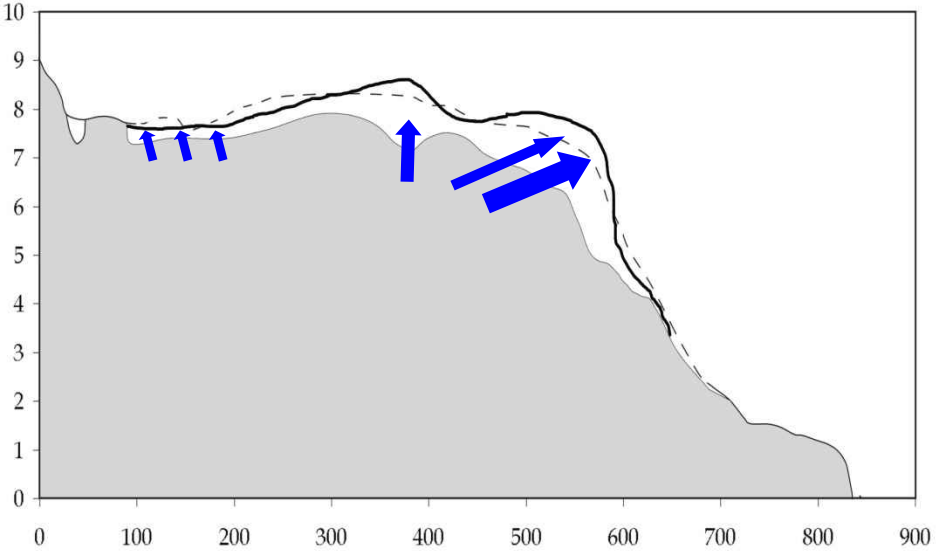
- Water level changes in every part of peatland over the year (identification of the most threatened and the most stable part as for water regime)

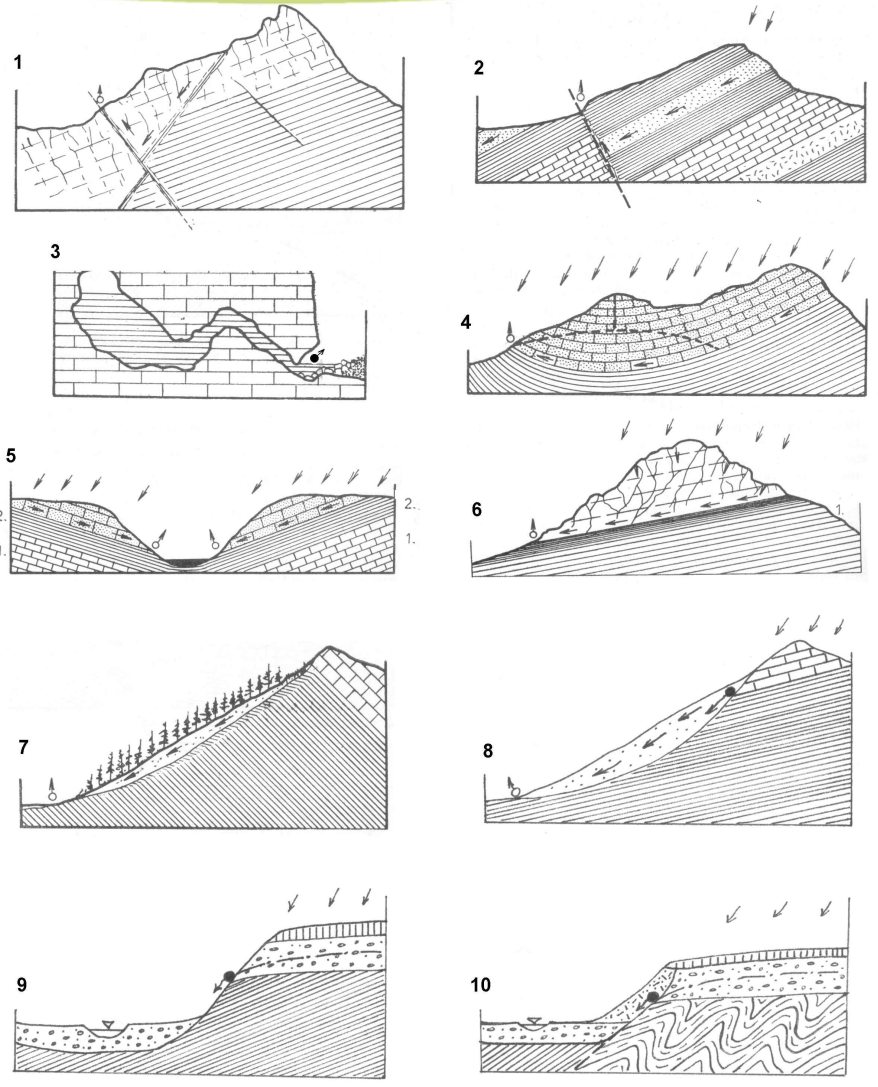


# To understand water regime we have to know:

- Origin of underground water - hydrological structure type
  (is it deepwater, water from long distance or local rainfall water?)

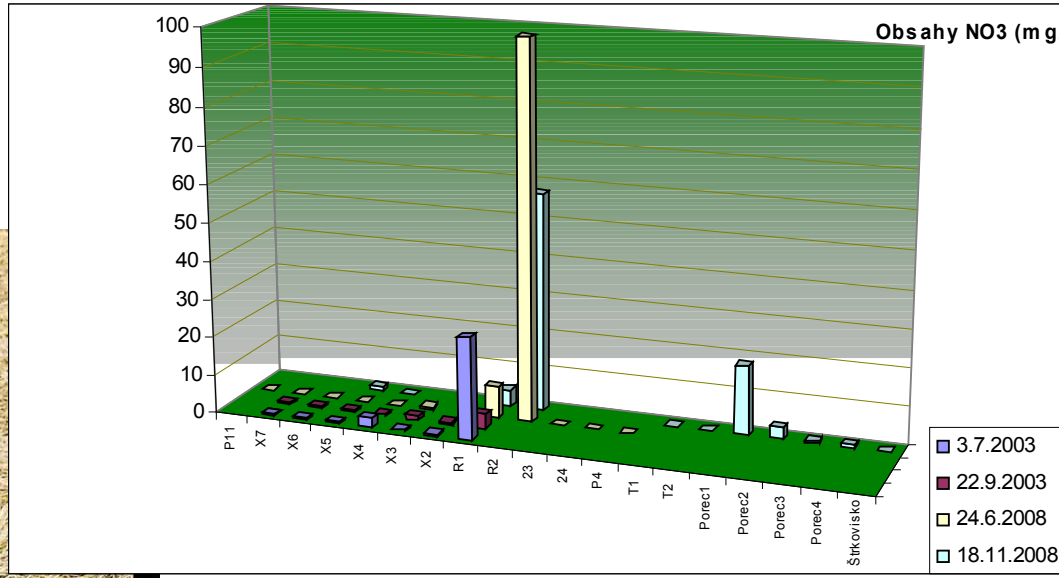




# To understand water regime we have to know:

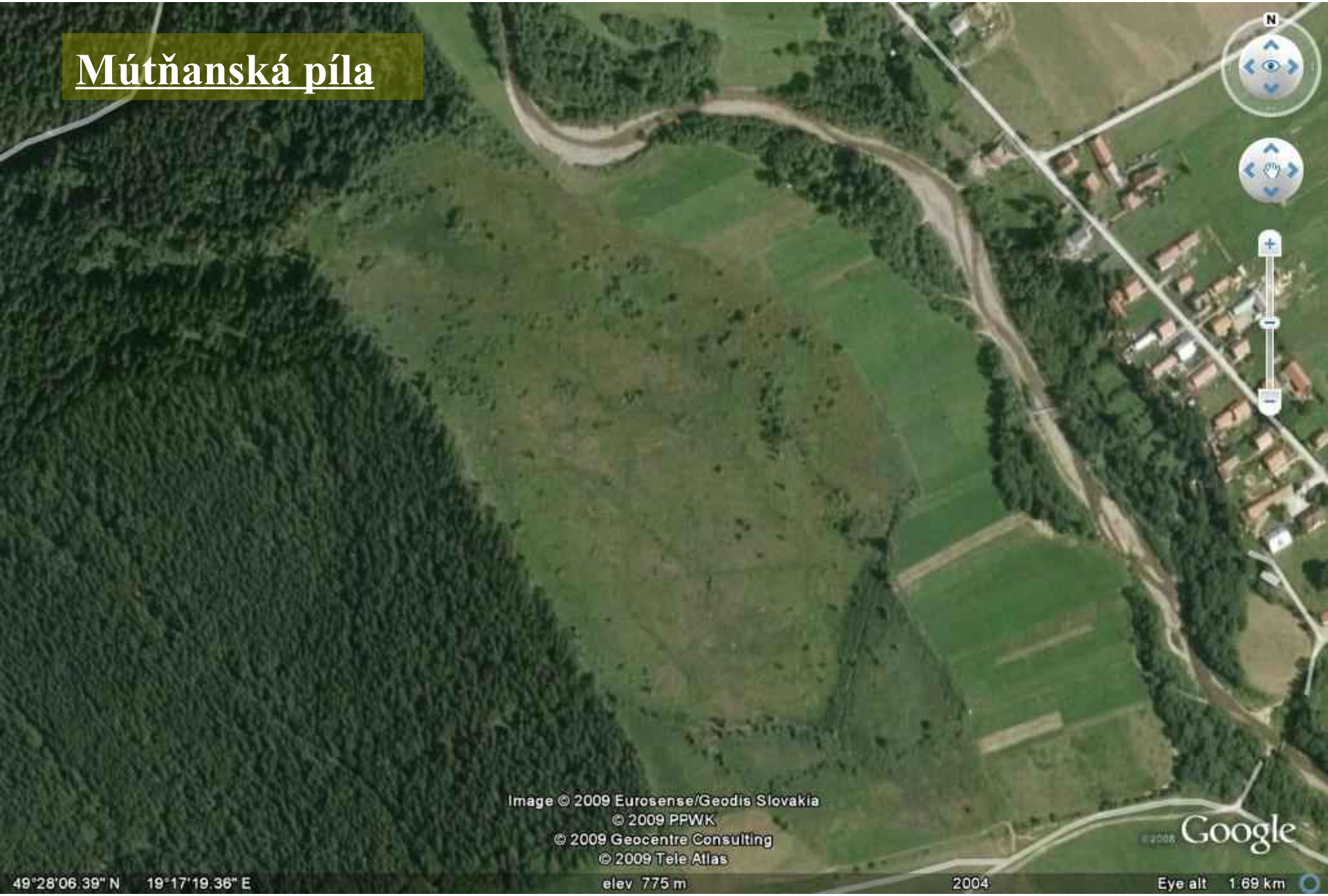
- Physical and chemical attribute of underground water
  (identification of water origin, geology, pollution, chemical processes, which can cause degradation of locality – pH changes, toxic metals...)



## Technical solutions of hydrological restoration

- Blocking of drainage channels
- Diking of the whole peatland
- Increase of water level in the surroundings of the peatland e.g. by increase of the stream bed
- Revitalization in the catchment

# Mútňanská píla



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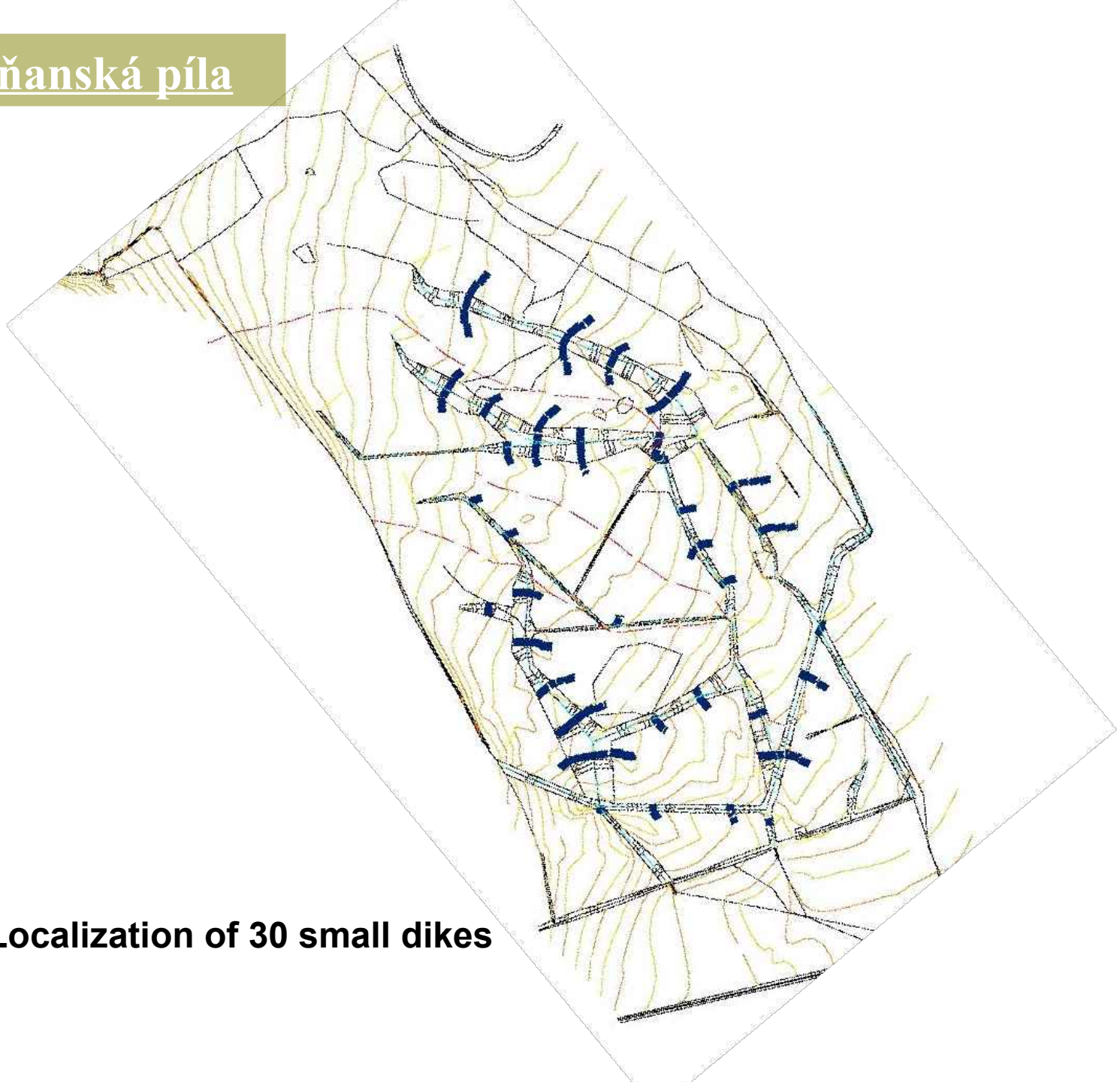

**Localization of 30 small dikes**

http://ec.europa.eu/environment/nature/natura2000/managem

Management models represent a useful tool for the conservation management of the Natura 2000 sites.