



Figure 8. Recently abandoned peat cutting field (Source: Raimo Heikkilä)

Figure 9. Abandoned, rewetted peat cutting field with common reed (*Phragmites australis*), attracting many birds (Source: Raimo Heikkilä)

4.3 Reed harvesting for biofuel production in the Narew National Park (Poland)

Site characteristics

The upper part of the Narew River valley (NE Poland) upstream of Rzędziany is one of the last extensive undrained, non-reclaimed valley wetlands in Central Europe. Internationally important wetlands developed in the wide, flat bottomed river valley and floodplain, together with the sinuous and completely natural passage of the river, are relics of a landscape that has almost vanished throughout Europe. From 1969 to 1980, the lower course of the Narew River between the junction with the Biebrza River and Rzędziany village (ca. 50 km) was comprehensively regulated and modified to change its natural course and prevent it from behaving as a natural system (through the channelization of the watercourse, and other river engineering works). This regulation lowered the average river level (Mioduszewski and Gajewska, 2000), resulting in a decrease in flooding frequency and depth, which had a rapid and negative effect on the hydrology, soil, vegetation and wildlife of adjacent marshes. The valuable river system and extensive peatlands have survived only in the valley between Rzędziany and Suraz. Since 1996 this part of the valley is protected as Narew National Park (NNP). NNP has a total area of 6810 ha (see Figure 10).

The vegetation of NNP consists of natural peat-forming plant communities: sedge (*Caricetum elatae*) and *C. gracilis* communities and reedy rushes (*Phragmitetum communis*). Small clusters of osier communities (*Salicetum pentandro-cinereae*) and single arborescent willows occur locally. Alder carrs (*Ribo nigri-alnetum*) are found sporadically at the valley margins (Dembek *et al.*, 2002). In total, 58 plant communities are found in the area. The Park contains more than 650 species of vascular plants, including many protected species (e.g. Siberian iris - *Iris sibirica*, Greek valerian - *Polemonium caeruleum*, common sundew - *Drosera rotundifolia*, gladioli - *Gladiolus spp.* and orchids - *Orchis spp.*).

NNP supports a number of breeding populations of bird species of national conservation concern (e.g. Black stork - *Ciconia nigra*, Spotted crane - *Porzana porzana* and Common redshank - *Tringa totanus*) as well as globally threatened species (e.g. Corn crane - *Crex crex* and Aquatic warbler - *Acrocephalus paludicola*). Due to its exceptional importance for birds, NNP has been designated a Wetland of International Importance under the terms of the Ramsar Convention. About 203 species of birds breed in the various ecosystems of the Narew wetlands and many migrating birds stop over. The Narew National Park harbours 40 species of mammals, the most characteristic of which – beaver – and others are connected with water or marshy areas. In addition, 13 species of amphibians and many fish species can be found in the NNP.

Site management

During the seventies the Narew River was channelled, resulting in a drawdown of the groundwater level. Because of this, the farmers reduced their agricultural activities and their management of the grasslands, reed and sedge areas. This was the stimulation for EURONATUR, a German NGO, to rebuild the old river system, in cooperation with farmers. Farmers then returned to the old fields and started to use them again for harvesting biomass; this was fed as hay to their animals and cut reed was used in stables. The removal of biomass from the wetland has a positive impact on regionally valued birds that only breed in

grasslands; if reed is not cut back regularly, the grasslands would be overgrown. These birds are now returning to Narew National Park.

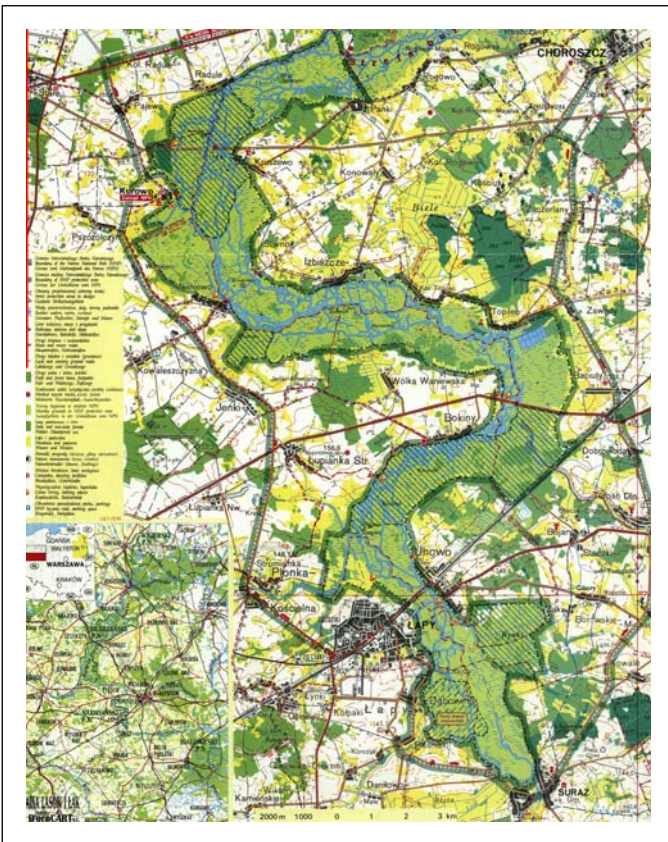


Figure 10. Narew National Park (Source: EURONATUR)

The management plan of the Narew National Park scheduled reed cutting on 2,000 hectares of the Park. However, they did not know what to do with the biomass. EURONATUR worked on the idea of producing heating materials from this biomass (especially reed), as harvesting and selling this biomass is a very good example of how nature conservation and sustainable rural development can be brought together. This, however, was not easy because of the situation in the Park. The Park consists of a complicated river system with small isles and river arms, which make it difficult to harvest the biomass. Furthermore, the ownership structure of the area is very complicated, as the fields are very small and belong to different farmers, some of whom have abandoned the area. A large part of the National Park is owned by the National Park Authority.



Figure 11. Briquettes made by using the reed in the Narew area (Source: Jutta Krumnacker)

One of the farmers, from the village of Zaczerlany, saw a good opportunity in harvesting the naturally growing common reed as biomass to produce heating materials (briquettes) and so to obtain an additional income. In the winter of 2007/2008, this farmer harvested 20 hectares of reed, and sold the briquettes to local consumers and neighbouring farms. If the demand for heating materials made from reed increases, the area will increase to 2,000 hectares. He has a contract with the National Park Authority, as he only harvests reed in the area owned by the National Park. More farmers may be willing to harvest reed to produce biofuels in the future, as the briquettes produced last winter have already been sold. If this trend continues, it may provide an incentive for other farmers to become biofuel producers. The only issue would then be to improve the access to the Park areas which need to be harvested; bridges would be necessary to access some fields.

Impact of reed harvesting on biodiversity in the Narew National Park

The area of reed in the Narew region was already quite large, but increased when agricultural activities in parts of the region ceased in the seventies. The increase in reed meant a decrease in the area of grassland. Certain species of birds require grasslands for nesting, so harvesting the reed biomass has a positive impact on these bird populations. The reed is only cut in winter and not during the breeding period.

If this reed were not cut, the numbers of grassland birds would decrease, and the goal of the Narew National Park management plan (cutting 2,000 hectares) would not be achieved. Furthermore, harvesting the naturally growing biomass in this area does not impact negatively on biodiversity, as the harvested amount is relatively small because such large quantities are available.

Advantages of reed harvesting for biofuel production are:

- securing the Narew wetlands against plant succession; protection of biodiversity;
- regional benefits through economic development – new 'green' jobs;
- renewable energy for the region.

Limitations of reed harvesting in the NNP are:

- inaccessibility of the mire area;
- environmental reasons; only a limited area within the NNP may be used for commercial activities;
- fragmented ownership: state property, where large-scale management could be implemented, amounts to only ~20% of the area;
- harvesting possibilities strongly depend on weather conditions.

The sustainable harvesting of reed to be used as biofuels has positive impacts on biodiversity in the Narew region and also offers opportunities for sustainable rural development, as the sale of reed pellets provides extra income for the local inhabitants.