

RECONSTRUCTION OF THE NATURE CONSERVATION DISTRICT MÁRTÉLY

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Abstract

After the regulation of rivers, there developed a characteristic riverside region, vegetation cover. As a result of human activity, in Western and Central Europe, these riverside regions of the Great Plain, the biocoenoses characteristic of the area, were partly or fully destroyed.

Along the river Tisza, in the district of Mártély, the natural landscape developed by the river control, even if in damaged condition, but in an area of more than 2000 hectares has survived. In consequence of the human intervention, also this area suffered a considerable impairment, as well. The still existing natural values are to be protected against further damages. The district, as a living museum, is to be put into service of science and education, taking into consideration the economic interests, as well. The autochthonous forest associations are to be restored. The species not indigenous on the region should be removed and only autochthonous ones may be planted.

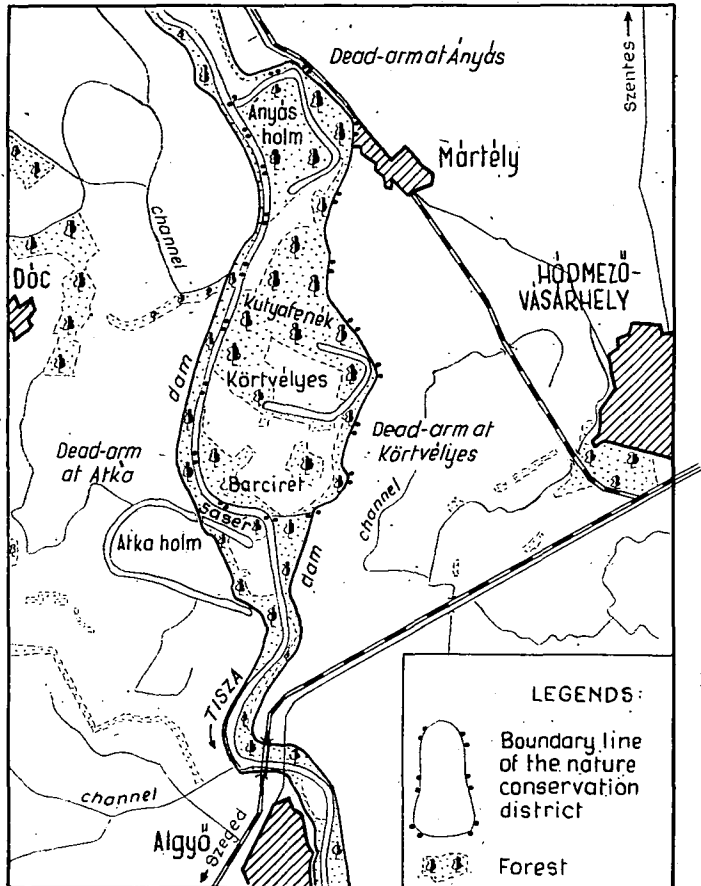
On the basis of an adequate, unitary plan, extending to every factor, during several decades the region can be reconstructed.

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By the regulation of riverways, the ancient natural floodplains along the rivers were transformed in accordance with the new conditions of waterways. Man continued forming the region and its biocoenosis with his management. The effort, irresistibly appearing in the given time, to achieve larger and larger crop results, pushed into the background to realize the consequences of these in the long run. Thus the natural regions along the rivers and their biocoenoses were transformed. In Western and Central Europe, the considerable natural riverside region and biocoenosis that developed by the river regulations, have been survived with comparatively minor damages alone in the flood-plain of the Tisza, in the area of Mártély, at a contiguous surface of more than two thousand hectares. A possibility of observing, investigating these biocoenoses is an irreplaceable treasury for instruction and science. The natural beauty of the landscape affords an inexhaustible source of inspiration for fine arts.

The experts have recognized these values and decided to preserve this region. The area under protection amounts to 2,252 hectares according to the registers of the Szeged State Board for Forest Surveying out of which the forested land is 1,298 ha, plough-land 308 ha, meadow 368 ha, pasture 76 ha, orchard 16 ha, and the land taken out of any cultivation is 166 ha. The orchard was destroyed owing to the inundation of 1970. Our task is to save and preserve the natural biocoenoses here, and to retain or restore the natural beauty of the landscape. Where some change took place

as a result of a former economic activity, there we should re-establish the natural condition prevailing in the time of Tisza regulation. The autochthonous trees, forest associations which had developed there and went through the difficulties of the large inundations without being damaged, are to be preserved as "gene-pools", reservations. The tree species and individuals which accommodated to the eventful local conditions, will and do have a very considerable part in producing propagating material.



The process of re-establishment is expected to last for many years or even for decades. Committing a fault in the course of the re-establishment, the period of reconstruction may extend by decades, and casually by a full rotation age. The work demands keen attention, the love of profession, and qualified experts. The financial means for reconstructing the forests are already provided for by means of the joint efforts of the Szeged State Board for Forest Surveying, and of the Szeged State Forest- and Wood-Processing Enterprise.

In the nature conservation district, silviculture takes place according to the plan regulations of the valid management (HALÁSZ *et al.* 1971). The prescriptions of the management plan demand casually some refinements but the effectuation of these is impeded by the management plan. If necessary, a modification of the management plan may also be possible.

Final cutting

The age of the final cutting of is to be raised to the maximum, taking anyway into consideration that the timber should not suffer qualitative damage because of the high age. In the course of the final cutting we have to endeavour that felling works should not take place simultaneously in a contiguous area larger than about 10 ha. An extensive cut area disorganizes harmfully the aesthetics of the landscape, disturbs its biocoenosis. It is practical to carry out cuttings in a forest department in a short time — not longer than three months. The felled timber is to be transported from the floodplain simultaneously with cutting works. In a dry weather, resp. in a time free of the danger of inundation the out material may as much as possible provisionally be piled at the edge of the cutting area, but it can be stored even in the cutting area, as well. In the cutting area the material is to be piled that it should not impede transport of the material cut and the soil preparation.

The euamerican poplars, is strange in the region, like: *Populus x euamericana* cv. *robusta*, *P. x euamericana marylandica*, *P. x I-214* must be planned first to cut (MAJER 1968).

Waste removal from the cutting area

Simultaneously with the final use, resp. after tree-felling, the cutting area is to be cleared away as soon as possible. Clearing is to be carried out in a way that it should not disturb the operations following later. If the waste will be piled on the spot and not cleared away from the area, the place of piles is to be formed out that it should not impede the soil preparation. The place omitted, because of a row of pile each, should not be broader than 4 m. These places left out from the soil cultivation may be used later on as transport ways.

Soil preparation

In the nature conservation district no total soil preparation work can be carried out. In case of ploughing, or of another soil operation similar to that, the herb and grass associations present there and the natural regrowth of trees would be fully destroyed. Therefore, there may only be performed a partial soil preparation — avoiding the total one.

The partial soil preparation may be performed, when required, with a pit-borer. The basic machine for soil preparation is the "E—TM—2 ERTI deep-loosener with double-shovel" (SCHMAL 1976). The surface of soil is not loosened by this machine, even if the ground is full of stumps, but in a breadth of 60 to 70 cm. The soil-loosening is 60 to 70 cm in depth, as well.

It is practical to form the rows that their axial distance should be 250 to 280 cm from each other. Then the middle-sized power-machines — of about 50 HP — and working tools connected to them find room in the space between two rows. In order

to crease natural impressions, the rows are to be formed, that they should have at least one wave in the row in every 50 to 100 m, which is at least as much as the distance between rows. In case of partial soil operation, the row-spaces preserve the elements of the natural plant association — apart from some minor damages. Later on, plants of the former vegetation may return to the stripes cultivated too.

By means of the machine mentioned above (“E—TM—2 ERTI deep-cultivator with double-shovel”, SCHMAL 1976), the loosening of the soil is to be performed generally in Summer, resp. in a season when the moisture-content of the soil is optimum for soil cultivation. The soil loosened is to be left mouldering at least for three months. We should begin planting only after that time. With the deep cultivator, the loosening is to be carried out in two rows. On the occasion of the second loosening, the machine should proceed in contrary direction to that in the first case. In this way we achieve a soil preparation of better quality. The stripes loosened are to be finished with a disk or a gyrotiller (hoe), at least in two rows. Immediately before planting for the sake of better weeding, it is purposive to perform harrowing with a disk-harrow. For harrowing, the “E—PST—1 suspended disk” is suitable (SCHMAL 1976). The tree sprouts, herbs and grosses growing in the row-spaces are to be removed with a stalk-crusher. Then the soil surface will not be broken.

Afforestation

In the nature conservation district only autochthonous tree species may be planted. We ought to endeavour to form autochthonous forest associations. These are: *Salicetum triandrae* MALCUIT 1929, Syn.: *Salicetum albae-triandrae* TÓTH 1958, *Salicetum albae-frangilis* ISSLER 1926, DOO 1958, 1960, 1961, 1962, Syn.: *Populeto-Salicetum* ZOLYOMI 1955, TÓTH 1958, *Fraxino pannonicae-ulmonetum* SOÓ 1958, Syn.: *Querceto-Fraxinoto-ulmonetum* SOÓ 1936. The species that are strange in the region must be ousted from the area. The multiplication in large numbers of *Fraxinus pensilvanica* and *Amorpha fruticosa* as species strange in the region means a great problem. Both tree species are renewed easily in natural way. The areas where more 100 pieces of seedlings/m² occur in form of natural regrowth are not rare. *Fraxinus pensilvanica* and *Amorpha fruticosa* as species strange in the region can, unfortunately, not be driven back from the nature conservation area in the foreseeable future. Even if we were successful to remove them, by a miracle, it would mean a temporary solution because the area would again be sown at the next inundation. *Fraxinus pensilvanica* and *Amorpha fruticosa* can everywhere be found in the Hungarian stretch of the Tisza flood-plain. For the time being we have to strive that none of those two species mentioned above should be used in the reforestation works, not even in a form of a mixture. In forest subcompartments where *Fraxinus pensilvanica* occurs in mixture on course of the tending operations her individuals should be removed as quickly as possible, of course without damaging the stock left behind. The final harvest age of the unmixed stands of *Fraxinus pensilvanica* should be shortened but this should not happen at the expense of the economic forest management at the site given. As *Amorpha fruticosa* is very photophytic, it may be ousted by withholding light from the interior of stocks. For doing this, the stocks are to be kept in a due closed stand. The *Amorpha* must be removed from the stock fringes in the course of thinnings. With the activity mentioned here, the expansion of *Amorpha fruticosa* and *Fraxinus pensilvanica* can only be restrained but they cannot be fully ousted from the area. We must accept them as intruded species.

At planting, the 250—280 cm row distance, formed by the deep loosener machine, is to be applied. The quantity of seedlings to be planted in each hectare is prescribed by the publication bearing the title "The afforestation spacings and tending models of the more important stand forming tree species", issued by the "Department of Forestry and Woodprocessing-Industry of the Ministry of Agriculture and Food". For *Populus alba*, *P. nigra*, *P. canescens* planting application of 5,000 seedlings per ha is prescribed by the above-mentioned publication. In case of applying the 250 cm row distance, with the above quantity/ha a stock distance of 80 cm is given. I consider this quantity too much if 1 to 2 years old seedlings of standard quality are planted. The afforestation spacing of 250 cm × 100 cm is satisfactory. In this way, 4,000 seedlings/ha is satisfying for afforestation. I regard the 250 × 100 cm planting spacing as satisfactory for willow stocks, as well.

In the above publication, a quantity of 6,000 seedlings/ha is prescribed for oak stands. In my opinion, this quantity is also too high on flooded lands. 5,000 seedlings/ha is satisfactory. In this way, a 250 × 80 cm planting spacing is given.

For planting, one or two years old seed-bed or transplant seedlings of good quality may be used. In case of willow stocks, afforestation with cuttings is satisfactory, too. In spots of deep laying land wet situation long cuttings may be used, mainly if the moisture condition of the soil does not make any soil work possible.

In the loosened stripes the planting can be performed by planting-machine of type "F-U-1" (SCHMALL 1976). If this is not possible because of the conditions, a pit-boring machine is to be applied. In case of emergency, we may perform pit planting by hand, as well.

For mixing the tree species it is always the indigenous ones, that should be used. We have to strive to mix primarily stocks of oak type. In the forest associations *Fraxino pannonicae-ulmonetum*, apart from the dominant tree species in the association, *Acer campestre* and *Pirus pyraster* may be mixed. From the shrubs, as autochthonous tree species, *Viburnum opulus*, *Cornus sanguines*, *Ligustrum vulgare* may be mixed. *Rubus caesius* plants itself here in natural way.

We have to provide, under any circumstances, for developing an adequate shrub storey. Creating on this way favourable conditions for the avifauna, the presence of which is an important indicator of the equilibrium of nature.

The indigenous poplar and willow stands, after final use, should be renewed by sprouting. The stump coppices are to be restrained, besides procuring for the living-space of root sprouts.

When the seeds of the white willow and of the indigenous poplars are ripe, as far as the hydrologic conditions and the weather are favourable, in the stripes cultivated, a considerable number of new plants are to be expected, originating from willow and poplar seeds. These new plants may have an important part in forming mixed stands.

Cultivation of afforestations

It is the most practical, to cultivate the row-spaces by means of a stalk crusher. The rows are to be hoed and plated. At cultivating we must be careful that the regrowth of seed origin and useful sprouts should remain in order to mix and complete the stand. At oak afforestations care must be taken of the natural regrowth of the poplars and willows that they should not be oppers, the young stock by their intensive growth.

Nursings are to be directed in the way, that they should finish in July. Thus the vegetation growing up in the second half of summer and in the course of autumn provides safe protection against the damage done by game. The cultivation of rows is only to be procured for in the year of afforestation. If some completions took place, the rows are to be nursed till finishing these. The nursing of row-spaces may become necessary till the technical accomplishment of afforestation.

In the nature conservation district the use of chemicals for soil preparation and weeding is not permitted in order to avoid water pollution and protect the existing plant associations.

Tending cuttings

These cuttings are to be carried out in a way that the aesthetic value of the area should increase. It is not necessary, to remove the individuals of dishevelled, rough, curved branchpattern which are present in the fringes of the stand. These individuals are worthless from point of view of woodprocessing but with their decorativeness they give a favourable landscape. A tempest-tossed, blasted old tree, struck by lightning is also a peculiar spectacle. We should therefore maintain them even if tree is already partly withered.

In order to breed the hole-dwelling birds, we have to spare the hollow trees, as well, mainly if they are dwellt. In the vicinity of nest-settlings, existing or beginning to take shape, the operations must be suspended as long as these would disturb nesting and rearing the young birds. If in the area a carefully protected predatory bird had settled down, it should be similarly protected with its unique nest, as well.

In the course of the tending, we should form small clearing of 0,1—0,2 ha size in the interior of stands. These small clearings solve the monotony of the large, contiguous forest areas. The forming of clearings is to be taken into consideration when carrying out the afforestations.

In the area of the nature conservation district, the most protected and defensible part is Körtvélyes. In the longest run, this area will supposedly provide for serving instruction, science, and fine art aims. We should therefore avoid any use that differs from the management plan, thus any cutting of trees in order to collect seeds.

In the area of the nature conservation district at Mártély, a considerable quantity of plough-lands or fallow lands in private property can be found. Owing to the unsettled flood conditions of the latest years, these areas — with a few exceptions — are not cultivated. It would be advisable to indemnify the owners by offering exchange lands for them. After the ownership regulation, the area should be afforested. The area mentioned here lies mostly at the higher situated riverside of the Tisza dead-arm. Therefore, this area would be suitable to form a forest association of *Fraxino pannonicae-Ulmetum* Soó 1958, Syn.: *Querceto-Fraxineto-Ulmetum* Soó 1936 (Soó 1964). Owing to the hydrological conditions, the habitat in the nature conservation district is, unfortunately, suited only in limited degree to develop an oak-stand considered as an aim.

Agricultural use of the area owned by a farming co-operative, has been — for long years — no more economical. Due to the unsettled water-fluctuations, in the area there can only be planted plough-land plant cultures of spring sowing, and these, too, rather late. A result of this is, that nursings are generally no more performed because they do not want to increase the amount of deficit. Thus the areas are neglected, running to weeds. It is not allowed by the rules of law to leave the area fallow in the long run. This excludes the possible nature regeneration of the forest. As a

result of the favourable weather and hydrological conditions in the year 1975, a very nice natural regrowth of indigenous poplars and willows have appeared in this area. These regrowth had unfortunately perished by ploughing. On the area felt one form ploughing for various reasons, a nice regrowth has appeared covering the soil in a quantity for enough to form the new stand. There is not, unfortunately, but rarely a year like this, when in the time of ripening of the seeds of home poplars the weather is favourable for the natural regeneration. In a weed-covered area, the competition of the weed roots excludes the possibility of the successful regeneration of indigenous poplars. We should urgently afforest the area mentioned here, as well, which is registered as a plough-land but practically is an area lying fallow. It is to be mentioned, too, that in the present-day form, the area mentioned above deteriorates and damages the aesthetical value of the nature conservation district. This area resp. a part of it — lying also at a higher level, is suitable for the formation of the forest association *Fraxino pannonicae-Ulmetum* Soó 1958, Syn.: *Querceto-Fraxineto-Ulmetum* Soó 1936 (Soó 1964).

The pasture-farming should generally be expanded over the meadow and grass-land areas in the nature conservation district. If this does not happen urgently, we have to reckon with the impoverishment of the plant association of the pastures. The light is closed by strong-stalked, high-growing individuals, resp. species, from short-stalked plants, thus these perish owing to the lack in light. It would be good to ponder over if the pastures could be utilized by keeping there the ancient Hungarian cattle species reared in the open-air, all the year round. In this case, it would be purposive to develop a herd of Hungarian grey-cattle and a flock of "racka" (a Hungarian variety of) sheep. For watching the animals, we had to procure for Hungarian sheep dogs (*Canis familiaris domesticus pecuarius*). Together with the establishments belonging to the pastoral life, as living museums, gene-reservations, apart from serving science, they would exercise some attraction in the field of tourism, as well. The above mentioned animal species may have in the course of their improvement a very important role.

In the area of the nature conservation district, as well as in the adjacent areas leased by the association of huntsmen, the reduction of the number of the beast of prey by poisoning must urgently be ceased. This suggestion of mice may be valid for the whole territory of Hungary, as well. Every year, we found unfortunately some carefully protected bird predators that perished owing to poisoning. These are threatened by the danger of extinction. In my opinion, the reduction of the number of the beast of prey could be successfully solved if the manifold sum of the present fee were paid by the association of huntsmen for shooting any beast of prey. A regulation like this would perhaps put a large material load on the association of huntsmen in the first year, later however no more, because the basic condition of the multiplication would narrow down. I am convinced that a regulation like this would be more practical and harmless than poisoning.

Some activities of goodwill but not deliberate enough can draw after themselves incalculable harmful consequences.

In earlier-years, herbivorous fish were introduced, without due reflection, into the Tisza dead-arm at Körtvélyes. The result of the want of due foresight became that the rich vegetation of the Tisza dead-arm completely perished. Thus the possibilities of the scientific research suffered a great loss. For the replacement of the vegetable kingdom of the Tisza dead-arm at Körtvélyes there is, unfortunately, no hope at all.

These descriptions only refer to the single emphasised or partial problems. It was

References

- HALÁSZ, G., LENGYEL, I., KATONA, Z.: Erdőgazdasági üzemterv, Mártély (Working plan in forest economy, Mártély) Szeged, 1971. (Manuscript)
- MAJER, A.: Magyarország erdőtársulásai (Forest associations in Hungary) Budapest, 1968. Publication of the Ministry of Agriculture and Food: Afforestation network and forest-raising pattern of the major stock producing kinds of tree (Hungarian) Budapest, 1976.
- Soó, R.: A magyar flóra és vegetáció rendszertani — növényföldrajzi kézikönyve (Taxonomical — geobotanical handbook of the Hungarian flora and vegetation) I. Budapest, 1964.
- SCHMAL, F. (ed.): Erdészeti gépismertető (A guidebook for forest machines) Békéscsaba, 1976.