



Overview of Vol.4, No.2 – Continental Europe

Restorations on the Continent: Western Europe restores a variety of ecosystems

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Construction on the Leaning Tower of Pisa began in 1174 and was completed in the second half of the 14th century. Shakespeare's Globe Theatre opened its doors in 1599 and finally closed in 1642. The Eiffel Tower was ready for tourists in 1889. Compared to some other parts of the world, the Europeans have been engineering their environment for a very long time. One of the results of these feats of engineering is that several natural areas are in a perilous state. Fortunately, however, the Europeans are pioneering restoration techniques and beginning to repair the damage of a thousand years.

Aquatic systems – management and practice

People have used waterways as a mode of transportation for hundreds of years. At first people traveled by canoe and affected the river very little. Later they built paddleboats and eventually gigantic oil tankers, which need a very precisely graded channel with a very predictable depth and flow. This change in mode of transportation led to the engineering of many natural rivers. Now that environmental awareness has grown and people realize the adverse effect that we have had on our planet, there is a desire on the part of many individuals to restore the great rivers to improve ecosystem health and water quality. Curlee details the history of the Rhine River and the effects of its channelization, such as a decline in the river's floodplain, the reinforcement of riverbanks, and the reduction in connections between the Rhine and the North Sea. Curlee describes the process by which the Rhine Action Program for Ecological Rehabilitation set its goals restoration and how they will be attained.

A simple way to move logged trees from the alpine forests where they are often cut to the sawmills is by floating them downstream. This practice is common in areas with high timber production, such as Canada and Finland. Unfortunately for the aquatic organisms, this common forestry practice wreaks havoc on the riparian and benthic community. In the paper on boreal stream restoration, Ederer discusses the physical and biological impacts of timber floating in streams. Some of the impacts reviewed are the effect of channelization on spawning grounds, the amount of CPOM, leaf litter, and woody debris that are retained by the stream, and the types of habitat that are altered by timber floating. Ederer describes the criteria used in determining the target species for a stream restoration and explains methods that have been used in restoration projects in Finland.

Another environmental problem in Europe is the degradation of wet heathlands by increased nutrient availability, due to agricultural fertilizer. Jeanette describes in her paper the characteristics of species rich heathlands that are historically found in the moist, acidic nutrient poor soils of the Netherlands. She discusses the decline of Ericaceous shrubs, primarily evergreen and dwarf heather, that has resulted from the increasing need for agricultural acreage. Jeanette explains the theory behind the decline of the native vegetation and the reasons for the

subsequent invasion of the grass *Molinia caerulea*. She makes several suggestions for managing and restoring the heathlands to their pre-agricultural state. Jeanette describes the benefits of reducing available nutrients and soil pH as well as removing above ground vegetation by sod harvesting.

Recreational restorations – managing for continuing disturbance

Europeans love a holiday. Two popular recreation activities are golfing and skiing. While the impact of these two sports on the environment is different, both sports utilize large land areas, making them targets for improved environmental management practices and habitat restoration projects. In Scotland, Wales and England there are 1,500 golf courses. In his review of habitat restoration at European golf courses, Larsen campaigns for conservation based management at all courses. Larsen addresses the reputation that golf courses have as being environmentally unfriendly and suggests that they could actually be wilderness sanctuaries because about 35% of golf course land is out of play area and therefore available for habitat restoration. The Environmental Golf Association recently formed an ecology unit, which evaluated the environmental practices and policies of eight European courses. The study provided a base for environmental enhancement of existing courses and made suggestions to course managers for improving environmental management of the course.

Skiing in Switzerland is as popular as golfing in the U.K. Unfortunately, the impacts of grooming alpine ski runs are greater than the impact of mowing golf fairways. The nature of alpine habitats makes them susceptible to erosion and damage by the heavy earth-moving machinery used to tailor the runs. In her study of a Swiss ski area restoration, Hatch describes the project's goals and the methods used to encourage indigenous plant growth under the constant pressure of continuing use. Because the number of species that are suitable for alpine regions is low, it was important to collect native cuttings, plants and seeds in order to maximize the chances of survivorship at the site. Hatch details other elements necessary for a successful alpine restoration, such as placing wood fiber mats over seeded areas to trap moisture and prevent erosion. At the end of her paper, Hatch discusses the method of evaluation used for the ski area restoration and gives insight into the ideology of restoration ecology.

National Parks – restoring degraded wilderness

Logging has occurred since the Middle Ages East Germany, Poland, and the Czech Republic. This has been a constant stressor on the health of the montane forests of Northern Bohemia. In addition to logging, tourism and industrial pollution have compounded the degradation of the forest ecosystems. Savanick discusses the restoration efforts trying to remedy these stresses in Krkonose National Park, Czech Republic. She describes the overall restoration and management plan for the park, as well as analyzing previous restoration methods. In the past, Norway pine have been planted in the place of logged trees, but Savanick points out that they only contribute to the slow acidification of the park's soils. Savanick explains that other restoration projects have been done in the park and suggests what the park staff can do to enhance the viability of such projects. This paper illustrates the successes and problems involved in restoring a degraded Eastern European park.