Case 1

Rehabilitation of riparian habitats: experience of the network of fluvial nature reserves

• The network of fluvial reserves

Following various watercourse schemes (channel rectifications, hydroelectric dams, reservoirs, embankment dams), to stream channel extractions, the functioning of fluvial environments has often been subjected to profound changes from which protected areas are not immune (floods, insufficient flow rates, more severe low flows, sinking beds, loss of connections, lowering of the water level, etc.).

In order to find solutions to these disturbances, the managers of twenty nature reserves have bundled their experience together into a network of fluvial nature reserves (Ile de la Platière on the Rhône, Ile du Girard on the Doubs, Ramières in the Drome, Val d'Allier, Seine Estuary, Mazière on a tributary of the Garonne, Erstein, Offendorf, Ile du Rohrschollen, Ile du Rhinau, Petite Camargue Alsacienne on a strip along the Rhine River, etc.). These reserves include the following habitats: vegetation along watercourses (Natura 2000 codes 3220 to 3290), riparian woodlands of willow or poplar (91EO, 92AO), forests of oak, elm and ash (91FO) and species habitats.

• Restoration experiments

Managers of fluvial reserves have implemented many actions at the reserve level, in their catchment areas, that have effects at different levels.

- Hydrological system:

- raising surface and ground water levels (instream flows, thresholds, etc.)
- improvement of flood flows
- management of solid discharge;
- reduction of pollutant flows
- re-establishing tributaries;
- setting up an area of lateral mobility for the watercourse

- Habitat and vegetation structure:

- management and restoration of alluvial forests used for silviculture;
- mechanical or pastoral management of alluvial meadows;
- restoration of degraded environments: former gravel extraction pits, disconnected stream sections, etc.

- Species:

- combating exotic invasive plants;
- actions targeted at remarkable species.

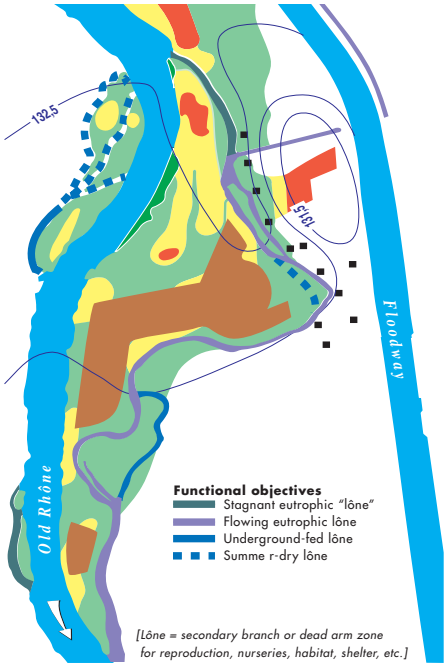
- Social dimension of natural habitats:

-actions on landscape, visiting rate
-information and training

• Monitoring

The exchange of experiences has also made it possible to perfect and apply monitoring protocols targeted at alluvial habitats (long-term monitoring of riparian areas, joint monitoring of macrophytes and odonates).

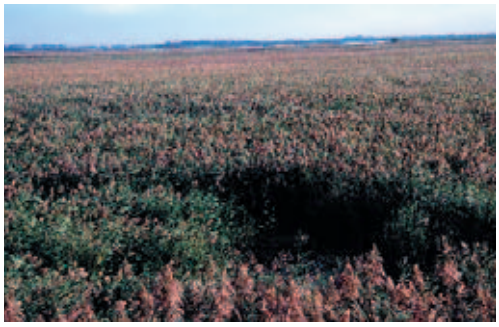
Aerial view of Ile de la Platière Reserve on the Rhône River.
Photo: Amis de la Réserve de l'Ile de la Platière



Drawing of restoration: Ile de la Platière

References:
• Michelot J.-L., 1995. Gestion patrimoniale des milieux naturels fluviaux. ATEN, RNF. 67 p.
• Traub N., Tabouret P., Pissavin S., Pont B., 2002. Guide pour la gestion des forêts alluviales de la moyenne vallée du Rhône. Réserve naturelle de l'Ile de la Platière, CRPF Natura 2000, 25 p.
• Pont B. 1995. Suivi à long terme de la dynamique forestière spontanée des ripisylves Première phase: mise au point de la méthode et test sur six reserves naturelles. Final report. RNF.
• Pissavin S., Pont B., Faton J.-M., 1998. Protocole de suivi à long terme des peuplements hydrophytes et odonates comme descripteurs de fonctionnement des hydrosystèmes. Test programme for 19 nature reserves. RNF, Ministry of the Environment., 11 p.

Contact:
Network of fluvial nature reserves: see RNF.



Charnier reed bed
Photo: D.Petit/Centre du Scamandre

Aerial monitoring of mechanical reed bed cutting in the Seine estuary
Photo: Maison de l'Estuaire

Case 2

Reedbed management: the "Reed Network" experience

• The Reed Network

Reed beds, clubrush beds, reed canary-grass beds and reedmace beds should be considered as species' habitats of the "Birds" and "Habitats" Directives. They are found along banks of water bodies and watercourse edges, and can form great stretches in marshes depending on the hydraulic regime and the type of management.

The Reed Network, which includes managers from forty reserves, has synthesized the experiences of its members and produced a technical guide to aid in decision-making for reed bed management.

• Habitat restoration and management

Exchanges have made it possible to set up a methodological approach. It is recommended to establish a preliminary diagnosis to describe the reed bed and its evolution; identify factors affecting management, natural heritage and functional interests; define objectives and choose the types of interventions.

The major types of techniques recommended are the following:
- Water management at the watershed level and for the long term
- Water level management at the site level
- Winter cutting (favours reed bed growth) or summer cutting (reduces such growth to diversify vegetation)
- Grazing (various breeds of cattle and horses)
- Winter or spring fire depending on whether the aim is densification or diversification
- Working the land (turf stripping, scouring)
- Chemical treatment

Scientific monitoring is recommended to verify the relevance and adjustment to the techniques chosen.

Example of guidelines for the economic exploitation of reed beds in the Seine Estuary Reserve (excerpt):
- Cutting period: 15 November to 15 March
- Removal of all products of macrophyte cutting
- Allow 20% of the area of each plot to stand.

Reference:
Sinnassamy J.-M. and Mauchamp A., 2001. Roselières: gestion fonctionenelle et patrimoniale. Cahiers Techniques ATEN. 96 p.

Contacts:
Réseau du "Roseau": see RNF
Station Biologique de la Tour du Valat

Case 3

Pond restoration: experience gained at the Chérine reserve in the Brenne

• Context

Management of the Chérine Reserve is a national frame of reference for managing ponds to foster biodiversity (habitat 3150, species habitats). The observations of and experiments done by its manager (for the last fifteen years), the Chérine Management Association, have made it possible to identify the principles and precise techniques to encourage wild fauna and flora in ponds while maintaining fish production capacity.

• Several principles of restoration

When a pond is created or redeveloped, an optimum shape can be found by altering its size and depth, and the transversal and longitudinal relief of its banks.

In richly vegetated ponds, various schemes have been successfully tested for water birds, insects, flora, amphibians and the European pond turtle. The schemes consist essentially in a diversification of the types of contact between vegetation and water: sinuous edges, islands of vegetation surrounded by water and channels dug among the reed beds.

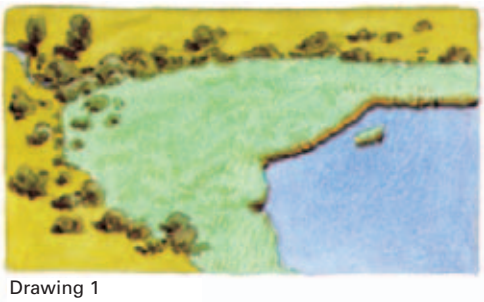
Regular management should not be neglected when vegetative growth and alluviation are rapid. Various mechanical means of maintenance by macrophyte cutting or other mechanical land clearing and grazing have been tested, particularly for helophyte belts, rush beds, willow carrs, riparian meadows.

The management of water levels is also essential and can be adjusted according to the ecological needs of the habitats and target species.

These principles remain relevant for the reconstitution of aquatic habitats from the development of gravel extraction pits nearing the end of their economic viability.

Grazing at the pond's outer edge at summer's end, Chérine Reserve in the Brenne. Photo: J. Trotignon

Restoration of the outer edge of a pond for birds



Drawing 1

Drawing 2

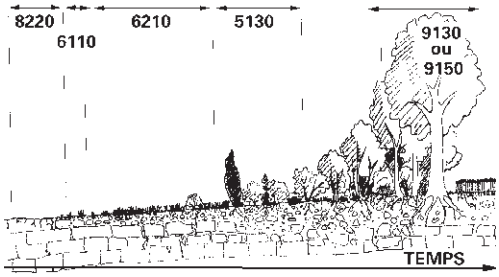
Drawing 3

Illustrator: F. Desbordes
(in "Des étangs pour la vie", Trotignon, 2000)

Reference:
Trotignon J., 2000. Des étangs pour la vie, améliorer la gestion des étangs. ATEN, LPO. 70 p.

Contact:
Chérine Nature Reserve; see RNF.

Mechanized grassland maintenance in the Vallées de Grand Pierre et Vitain Reserve
Photo: CDPNE



Vegetation dynamics from pioneer grassland to beech forest on a thin calcareous soil (by P. Maubert)

Monitoring of vegetation in Vallées de Grand Pierre et Vitain Reserve
Photo: CDPNE

References:
Maubert P. and Dutoit T., 1995. Connaître et gérer les pelouses calcicoles. ATEN, 65 p.
Bezannier F., Boulongne R., 2000. Actes du colloque: "La gestion des pelouses calcicoles". Recherches Naturalistes en Région Centre nr. 7, 95 p. + annexes.

Contact: CDPNE. See RNF.

Case 4

Maintenance of calcareous grasslands by mowing or grazing: the experience of the Vallée de Grand Pierre et Vitain Nature Reserves

• The context

Calcareous grasslands are predominant habitats in reserves and in the Natura 2000 sites (habitat 6210). The primary, natural threat is vegetation dynamics, leading to wooded stages that occur at an accelerated rate depending on the type of soil.

One point, which is also valid for other types of open habitat, is that certain stages of the plant succession, prior or subsequent to the grassland, are also habitats (codes 8240, 6110, 5130, 9130 or 9150). Furthermore, studies have shown that the neighbouring rate of thicket development of 25% was the optimum for faunal diversity. It is therefore suitable to bring about a spatial equilibrium between the different stages, in the form of a mosaic, if possible, or by patch areas or strips if mechanization requires it. This objective leads the manager to block certain stages and let others progress. To maintain the areas of open grasslands, the plant matter produced needs to be exported by appropriate means.

• Management recommendations

The Departmental Committee for Nature and Environmental Protection (CDPNE) has been monitoring the effects of different methods of grassland maintenance on the flora and insects of the Vallée de Grand Pierre et Vitain for more than ten years.

The results show that grazing (with Solognote sheep) is the most natural method, but the risk of overgrazing, which is harmful to vegetation and insects, must be closely monitored and avoided by means of rotational grazing or continuous grazing with a low stocking density. The manager should refrain from calculating an ideal stocking density, expressed in Livestock Units (LU), as long as site or climatic conditions are varied or fluctuating. Rabbit activity, variable depending on the year, is also an important factor to take into consideration. The manager recommends a follow-up with, if necessary, readjustments to the stocking density or duration of grazing. Immediate, high stocking can be beneficial in the restoration phase. Whatever the type of grazing with sheep, the thickets must be cut and removed periodically.

As far as mowing is concerned (when it is technically feasible), it is a matter of substitution, new for grasslands, which presents a well-known risk. Complete mowing is traumatic for insects and other animals that depend on such vegetation, and determines the flora that will eventually develop. The solutions found include late mowing (autumn or winter), two or three-year rotation mowing, centrifugal mowing leaving refuge strips. Effects on the flora are less varied (more homogeneous vegetation structure) than with well-managed grazing.

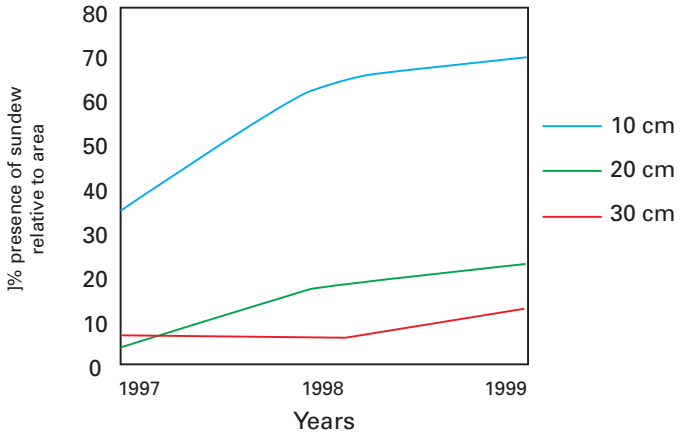
Case 5

Restoration of peaty habitats: experience gained at Landes de Versigny Nature Reserve

• Context

A peat bog wooded with birch, in the Landes de Versigny Reserve, was rejuvenated by its manager, the Conservatoire des Sites Naturels de Picardie. The aim was to study the feasibility, on a one-hectare experimental area, of a deforestation followed by turf stripping (removal of litter and the upper layers of peat) with standard equipment (caterpillar tractor with mechanical shovel, front end loader tractor with low-pressure tires).

After felling one ha of birch in the Landes de Versigny Reserve, the Conservatoire des Sites Naturels de Picardie began mechanical turf stripping (removal of upper layers of peat) in order to restore the young stages of the peat bog.
Photo: Conservatoire des Sites Naturels de Picardie



Evolution of sundew recolonisation of three surface layers created by stripping to different depths (Conservatoire des Sites Naturels de Picardie).

• Experimental results

The operation was a success: more uniform savings of time and work relative to manual turf stripping, soil hardly damaged, rapid return of young peat bog plants. Scientific monitoring of surfaces stripped at different depths showed that:
- Heather is rapidly restored after simple raking of the forest litter.
- Turf stripping to 10 cm is optimal for the appearance the following year of round-leaved sundew and cross-leaved heath, unlike turf stripping to 20 and 30 cm.

Other French peat bogs have benefited from the LIFE-Nature programme, facilitated by ENF, meant to test different methods of restoration and maintenance adapted to different types of habitat (Codes 7110, 7120, 7130, 7140, 7230, species' habitats).

Two years after the operation, pioneer species of the peat bog, such as the round-leaved sundew, established themselves.
Photo: Conservatoire des Sites Naturels de Picardie

Reference:
Dupieux N., 1998. La gestion conservatoire des tourbieres de France. ENF. 244p.

Contacts:
Reserve Landes de Versigny
Espaces Naturels de France

Case 8

Maintenance of difficult natural environments by grazing: experience of the RNF's Pastoralism Group

Highland cattle in the Marais de Lavours Reserve. Herd owned by the manager, Entente Interdepartementale de Démoustication (mosquito eradication).
Photo: A. Chiffaut

Grazing of dry meadows in Plateau de Mancy Reserve as part of an agreement with the Agricultural College of Mancy that must respect certain guidelines.
Photo: A. Chiffaut

• Context

Following abandonment of the least agriculturally exploitable lands (dry meadows, fens, peat bogs, pond edges, etc.) and the resulting spontaneous woodland, some managers have undertaken a return to grazing on an extensive scale and by means of breeds that are adapted to precarious climatic and nutritive conditions. These managers have formed a Pastoralism Group within the RNF to compare and highlight their experiences with herd performance and monitoring of their effects on the landscape. Members of this workgroup include the following nature reserves (and corresponding grazing animals): Mannevilles (Highland cattle), Tour du Valat (Camargue horses), Ile du Girard (Konik Polski horses), Baie de Canche (Shetland poneys), Chérine (Casta cattle), Cousseau Pond ("sea" cows), Lileau des Niges (Scottish Blackface sheep).

• Experimental results

Scientific monitoring shows the benefit of this type of management for vegetation (species and structural diversification), birds (opening of the environment) and insects. However, it also shows certain limitations: exclusion of bracken fern and alder, difficulty in adjusting stocking rate relative to climatic uncertainties in the case of continuous grazing. It is generally considered more effective to used mixed herds (cattle and horses). Extensive management with low-maintenance breeds has quickly become a popular reference, because it responds to the concern of many managers and landowners hoping to combat the progression of land abandonment at the least cost. The landowners and hunters of the Marais-Vernier have been greatly inspired by the pastoral management method tested in the Mannevilles Reserve (Highland cattle and Camargue horses) and in the Courtils de Bouquelon Reserve (Bretonne Pie Noire cows).

The references gained by members of the Pastoralism Group are especially useful for drafting specifications for Natura 2000 contracts signed with landowners wishing to maintain their parcels by grazing and having no production aim.

Reference:
Lecomte T., 1995. Gestion écologique par le pâturage: l'expérience des réserves naturelles. ATEN, RNF, 77 p.

Contact:
Pastoralism Group, see RNF

Case 9

Survey of and information from owners of the Moyenne Vallée du Rhone site

• Objectives

Description of the approach and awareness-raising programme for landowners.

Setting up Natura 2000 management contracts

• Context/Issue

Area of site: 4000 hectares over 49 communes and 4 departments.

Landed property: 50% private properties and 50% public fluvial domain

Average parcel size in some sectors: 0.25 ha.

• Method

- Consultation of cadastral maps at the Centre Departemental des Impots that combines the cadastres of all communes.
- Acquisition of cadastral maps relevant to the site for archives and use during meetings with landowners.
– Report of extent of Natura 2000 site on a cadastral map (1:2000 in general).
– Listing of relevant parcels (commune section, parcel nr.).
– Consultation of corresponding microfiches and parcel information report (area mapped for cadastre, nature culture, joint possession status) and landowners (name, address).
- Setting up a "landowners/parcels" database (of the 2100 ha mapped for cadastre: 3450 parcels for 1600 landowners).

• Means of providing information

- Sending a mailing to the group of landowners: mail from the prefect + surveys of relevant parcels + DOCOB information booklet.
- Organization of local meetings with landowners

• Operational costs (year 2000)

- Cadastral survey: 32,000 € (about 100 days of work + travel expenses + map purchase + management costs).
- The cost would have been much less if the cadastre had been digitized (currently taking place in many Departments).
- Information from landowners: mailings + local meetings: 5000 €.

• Essential prerequisites to complete the operation

- Mandate from DDAF administration for consultation of all the cadastres and purchase of cadastral maps at administrative rate (otherwise coast would be 1.5 times greater).
- CNIL (site) listing to computerize data.

• Problems encountered

- Significant amount of time needed for research of cadastres.
- Lack of cadastral updates (mainly for succession of ownership).
- Difficulty for joint possession of parcels.
- Incorrect addresses (returned post): 330 (i.e., 20%)
- No possibility of computerized management of cadastral maps (cadastral copyright).
- Little return attendance by landowners for meetings necessitates renewing contact by phone (requiring additional research in phonebooks).

Contact:
Association des Amis de la reserve de l'Ile de la Platière.