# G1.1 Temperate and boreal softwood riparian woodland

## Summary

This habitat comprises riparian woodland on periodically-inundated river terraces of active floodplains in the boreal, boreo-nemoral, nemoral, submediterranean and steppe zones with deposition of nutrient-rich alluvium. Typically there is a tall species-poor tree canopy, an often dense understorey with lianes and a field layer of nutrient-demanding herbs. Woody flood debris is common. Threats include modification of hydrographic functioning through damming and flood control, urbanisation, agriculture, afforestation, pollution, invasion by alien species and climate change. Conservation measures include maintenance of floodings and natural banks and protection against clearance or reafforestation.

## Synthesis

Even if the decline in quantity has been slight (-13.4 to -13.8%) for the last 50 years (the current trend is still a decline in most countries), the Near threatened category is reached because of a more than moderate decline in quality (54 to 55 %) on 34 to 35 % of the surface (between 30% and the 50% level that qualifies the Vulnerable category). The situation is very different between countries, and a VU, EN and even CR category would have been reached in some countries (especially in central Europe). In North-western Europe the situation seems to be better. The current trend is still a decline in quality in many countries, except in north-western countries (British Isles, Benelux, Germany).

| Overall Category & Criteria | | | |
|---|---|---|---|
| EU 28 | | EU 28+ | |
| Red List Category | Red List Criteria | Red List Category | Red List Criteria |
| Near Threatened | C/D1 | Near Threatened | C/D1 |

## Sub-habitat types that may require further examination

No sub-habitats have been distinguished for further assessment.

## Habitat Type

### Code and name

G1.1 Temperate and boreal softwood riparian woodland

Poplar and willow G1.1 Riparian woodland of the alliance Salicion albae Soo 1930, association Salicetum albae Issler 1926 in the Allier Valley, France, the last (almost) free flowing large river in Western Europe (Photo: Benoît Renaux).

In the background, white willow G1.1 Riparian woodland. In the foreground, the *Salix purpureae* scrub falls within another habitat type, F9.1 Temperate and boreal riparian scrub). Allier river, France (Photo: Benoît Renaux).

## Habitat description

This is riparian woodland occurring on periodically-inundated river terraces of active floodplains with deposition of nutrient-rich alluvium in the boreal, boreo-nemoral, nemoral, submediterranean and steppe zones. Typically, there is a tall canopy dominated by one or a few tree species, commonly *Salix alba,* sometimes *S. fragilis* (maybe favouring situations where there is lime-deficiency). Two other trees commonly found here are *Populus alba* which is really a submediterranean tree but widely planted and naturalised and *P. nigra*, native in a large part of Europe (from western to central south-eastern part), but also widely planted, though often outnumbered there by hybrids such as *P. x euramericana* and *x canadensis*. Typically, alder is absent from the canopy and riparian woodlands where *Alnus glutinosa* or A. incana form part or all of the tree cover are not included here but with land-upheaval woodlands in G1.2a Alnus woodland on alluvial and mineral soil. There is often a dense understorey of smaller *Salix* spp., *Sambucus nigra* and other shrubs beneath the trees, the composition of this layer depending on the local degree of wetness of the ground. Among these, tangles of lianes and sprawlers such as *Galium aparine* and *Solanum dulcamara* occur. The field layer is typically dominated by a luxuriant cover of shade-tolerant, nutrient-demanding tall herbs, notably *Urtica dioica*, in mountain areas also *Petastites hybridus*, with a carpet of smaller plants beneath. Characteristically, much of the taller herb cover dies back quickly in autumn to leave a patchy carpet of mat-forming bryophytes on exposed mud. After a flood, there can be much woody debris washed in from upstream. This type does not include scrubs dominated by narrow-leaved *willows S. eleagnos, S. purpurea* and *S. viminalis* which fall within F9.1 Temperate and boreal riparian scrub.

Indicators of quality:

● Undisturbed hydrology with natural disturbance, at least periodically inundated with flood waters in

uncontrolled stretches of mature rivers, though remnant stands can persist for some time around naturally isolated ox-bows.

- Survival of larger stands of forest continuously developed along the rivers without fragmentation and isolation
- Few if any signs of exploitation for timber, fallen trees remaining in situ and ample deposition of natural organic debris from flooding.
- No signs of eutrophication or pollution by anthropogenically enriched flood-waters, for example excessive spread of nutrient-demanding weeds.
- Absence of non-native tree species (Alien Poplar, Robinia pseudoacacia, Acer negundo...) and absence of invasive aliens such as *Reynoutria japonica* or *Impatiens glandulifera*.
- High diversity of epiphytic bryophytes (eg. *Orthotrichum* spp.)

Characteristic species:

Tree canopy: *Salix alba, Salix dasyclados, Salix eleagnos, Salix fragilis, Salix purpurea, S. viminalis, S. eleagnos* Understorey: *Crataegus monogyna, Rubus caesius, Salix triandra, Sambucus nigra*. Field layer: *Aegopodium podagraria, Athyrium filix-femina, Galium aparine, Solanum dulcamara, Glechoma hederaea, Geum urbanum, Poa trivialis, Urtica diocia, Heracleum sphondylium, Carduus personata, Petasites hybridus, Filipendula ulmaria* Mosses: *Brachythecium rutabulum, Eurhynchium praelongum, Plagiomnium undulatum*

## Classification
This habitat may be equivalent to, or broader than, or narrower than the habitats or ecosystems in the following typologies.

EUNIS:

G1.1 Temperate and boreal softwood riparian woodland

EuroVegChecklist alliances :

*Salicion albae* Soó 1951

*Rubo caesi-Populion*

Annex 1 :

92A0 Salix alba and Populus alba galleries (partly)

91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)

Emerald :

G1.11 Riverine Salix woodland

MAES-2:

Woodland and forest

IUCN:

1.1 Boreal Forest

1.4 Temperate Forest

EFT:

12.1 Riparian forest

VME:

U3.1 Hardwood alluvial forests in combination with willow and poplar alluvial forests.

**Does the habitat type present an outstanding example of typical characteristics of one or more biogeographic regions?**
No

<u>Justification</u>
It is an azonal type represented in suitable situatiosn across much of temperate Europe.

## Geographic occurrence and trends

| EU 28 | Present or Presence Uncertain | Current area of habitat | Recent trend in quantity (last 50 yrs) | Recent trend in quality (last 50 yrs) |
|---|---|---|---|---|
| Austria | Present | 40 Km$^2$ | Decreasing | Decreasing |
| Belgium | Present | 2,6 Km$^2$ | Increasing | Decreasing |
| Bulgaria | Present | 200 Km$^2$ | Decreasing | Decreasing |
| Croatia | Present | 409 Km$^2$ | Decreasing | Decreasing |
| Cyprus | Present | 0,3 Km$^2$ | Increasing | Stable |
| Czech Republic | Present | 27 Km$^2$ | Decreasing | Decreasing |
| Denmark | Present | 50 Km$^2$ | Unknown | Decreasing |
| Estonia | Uncertain | 35 Km$^2$ | Increasing | Increasing |
| Finland | Aland Islands: Uncertain Finland mainland: Present | 50 Km$^2$ | Decreasing | Decreasing |
| France | Corsica: Uncertain France mainland: Present | 600 Km$^2$ | Decreasing | Decreasing |
| Germany | Present | 40 Km$^2$ | Increasing | Decreasing |
| Greece | Greece (mainland and other islands): Present | 352 Km$^2$ | Unknown | Decreasing |
| Hungary | Present | 420 Km$^2$ | Increasing | Unknown |
| Ireland | Present | 0,9 Km$^2$ | Increasing | Stable |
| Italy | Italy mainland: Present Sardinia: Present Sicily: Present | 534 Km$^2$ | Decreasing | Decreasing |
| Latvia | Present | unknown Km$^2$ | - | Decreasing |
| Lithuania | Present | 17 Km$^2$ | Stable | Decreasing |
| Luxembourg | Uncertain | unknown Km$^2$ | - | - |
| Netherlands | Present | 44 Km$^2$ | Increasing | - |
| Poland | Present | 60 Km$^2$ | Decreasing | Decreasing |
| Portugal | Portugal mainland: Uncertain | Km$^2$ | - | - |
| Romania | Present | 960 Km$^2$ | Decreasing | Decreasing |
| Slovakia | Present | 8 Km$^2$ | Decreasing | Decreasing |
| Slovenia | Present | 28 Km$^2$ | Decreasing | Decreasing |
| Spain | Balearic Islands: Present | 89,1 Km$^2$ | Decreasing | Decreasing |

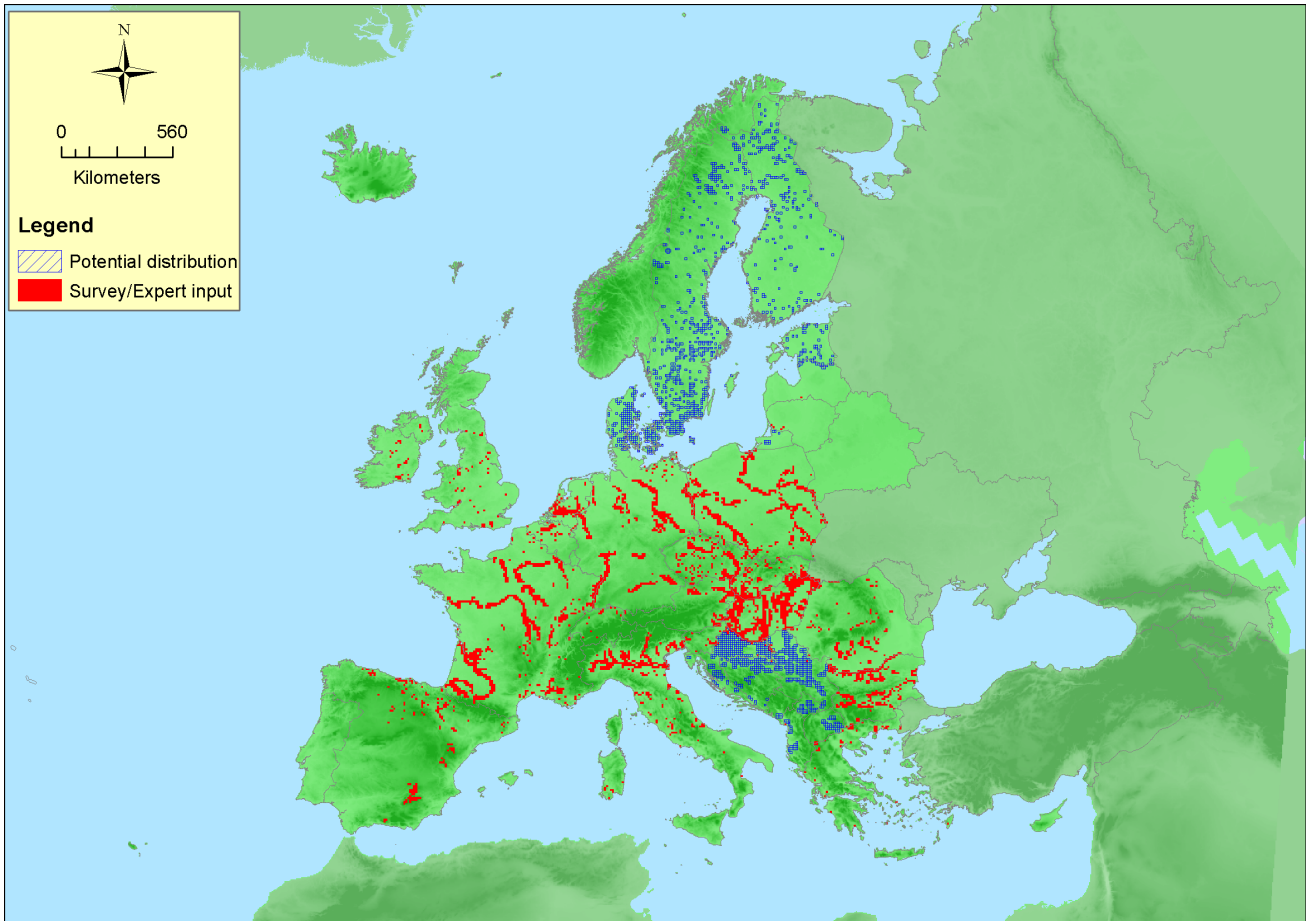| EU 28 | Present or Presence Uncertain | Current area of habitat | Recent trend in quantity (last 50 yrs) | Recent trend in quality (last 50 yrs) |
|---|---|---|---|---|
| *Sweden* | Present | unknown Km$^2$ | - | - |
| *UK* | Northern Island: Present<br>United Kingdom: Present | 80 Km$^2$ | Increasing | Decreasing |

| EU 28 + | Present or Presence Uncertain | Current area of habitat | Recent trend in quantity (last 50 yrs) | Recent trend in quality (last 50 yrs) |
|---|---|---|---|---|
| *Albania* | Present | Km$^2$ | - | - |
| *Bosnia and Herzegovina* | Uncertain | 100 Km$^2$ | Decreasing | Decreasing |
| *Former Yugoslavian Republic of Macedonia (FYROM)* | Present | 40 Km$^2$ | Unknown | Decreasing |
| *Iceland* | Uncertain | Km$^2$ | - | - |
| *Kaliningrad* | Present | Km$^2$ | - | - |
| *Kosovo* | Present | 25 Km$^2$ | Decreasing | Decreasing |
| *Montenegro* | Present | 20 Km$^2$ | Unknown | Unknown |
| *Norway* | Norway Mainland: Present | 274 Km$^2$ | Decreasing | Decreasing |
| *San Marino* | Uncertain | Km$^2$ | - | - |
| *Serbia* | Present | unknown Km$^2$ | - | - |
| *Switzerland* | Present | 3 Km$^2$ | Decreasing | Decreasing |
| *Vatican City* | Uncertain | Km$^2$ | - | - |

## Extent of Occurrence, Area of Occupancy and habitat area

| | Extent of Occurrence (EOO) | Area of Occupancy (AOO) | Current estimated Total Area | Comment |
|---|---|---|---|---|
| *EU 28* | 7597700 Km$^2$ | 4526 | 4600 Km$^2$ | AOO and EOO incl. potential distribution |
| *EU 28+* | 7597700 Km$^2$ | 5268 | 5400 Km$^2$ | AOO and EOO incl. potential distribution |

## Distribution map

Map is incomplete in the boreal region and the Balkan (the potential distribution is indicated) and for Portugal. Data sources: EVA, Art17, BOHN, NAT.

## How much of the current distribution of the habitat type lies within the EU 28?

Just treating EU28 and EU28+, 85% occurs in the former according to the data provided. More widely, very roughly, about 50% of the habitat might lie within the EU 28, 5% more in the rest of EU 28+ and the rest in eastern Europe (Former USSR countries).

## Trends in quantity

The average recent past-present trend in extent for the last 50 years is a decrease, which concerns mostly southern europe (including France) and central and eastern Europe. This decrease concerns 16 countries out of 34 (corresponding to 57% of the extent, increase in only 6 countries for 9% of the area, stable in 3 countries for 12% if the area, unknown trend in the rest of Europe)

The worst trend is reported in Czech Republic and Slovakia with a 85 and 60% decline (which would lead to a CR and EN category in those countries). Most countries report a slighter decline in quantity for the last 50 years, except those where the habitat has been removed before the 19th century to enlarge grasslands and is now increasing because of a better protection (increase in Belgium, the Netherlands, Germany, Ireland, Estonia, stability in the UK or Hungary).

Current trend is a decrease (in EU 28 decreasing on 66 % of the extent, stable in 21%, increasing in only 1% and unknown trend on 13%. ; in EU 28+ decreasing on 67 % of the surface, stable in 16%, increasing in only 1% and unknown trend on 16%).

- Average current trend in quantity (extent)
  EU 28: Decreasing
  EU 28+: Decreasing

- Does the habitat type have a small natural range following regression?

  No

  *Justification*

  The habitat is an azonal type with a large EOO although individual stands are often small.
- Does the habitat have a small natural range by reason of its intrinsically restricted area?

  No

  *Justification*

  The habitat is an azonal type with a large EOO although individual stands are often small.

## Trends in quality

The average recent past-present trend in quality is a slight to moderate decline (40% in severity) in most countries (20 out of 28 countries), affecting 37.5 % of the extent. The current trend is a decrease in quality in most of the countries, representing more than 95 % of the current areas. A stable trend is only reported in Ireland, Germany, Denmark, Austria, the Netherlands. The trend seems to be even better in Cyprus, Estonia and Latvia. The situation is not clear in France and the trend could be closer to stable today.

- Average current trend in quality

  EU 28: Decreasing

  EU 28+: Decreasing

## Pressures and threats

The main pressure affecting temperate and boreal softwood riparian woodland is a change in the hydraulic condition, with dams, river regulation and canalisation, hydropower projects causing a lack of flooding and the colonization of hardwood trees (70% of the countries are affected). Flooding is crucial because it rejuvenates both soil and vegetation, depositing silt and debris that fertilises the soils and preventing the softwood stand from maturing toward a hardwood forest.. River regulation and gravel extraction in (or near) the river bed can also cause a drying out. the drop in water level allowing the riparian vegetation to be replaced by a dryer one, with more shade tolerant and long-living trees. Pollution caused by a poor quality of water and the use of pesticides and fertilizers by agriculture in nearby fields, is also a problem (reported in 44 % of the countries).

Invasive non-native species are also a big problem (occuring in 56 % of the reported countries), alien species replacing native ones both in the herb layer (eg. *Reynoutria sp., Impatiens glandulifera)* and tree layer (eg. *Acer negundo, Robinia pseudoacacia*, north-American *Populus* spp.).

Finally, forest clearance mostly for urbanisation(17 %) and forest management (21%) are reported, but might occur less frequently than in hardwood types. Other threats are grazing (7 %) and climate change (7%, with more droughts and less precipitations, or on the contrary more flooding causing more erosion).

### List of pressures and threats

**Sylviculture, forestry**

Forest and Plantation management & use
Forestry clearance
Grazing in forests/ woodland

**Transportation and service corridors**

Roads, paths and railroads

**Urbanisation, residential and commercial development**

Urbanised areas, human habitation

#### Pollution

Pollution to surface waters (limnic, terrestrial, marine & brackish)
  Diffuse groundwater pollution due to agricultural and forestry activities

#### Invasive, other problematic species and genes

Invasive non-native species

#### Natural System modifications

Human induced changes in hydraulic conditions
  Canalisation & water deviation
  Lack of flooding
  Small hydropower projects, weirs

#### Climate change

Droughts and less precipitations
Flooding and rising precipitations

## Conservation and management

The keys to the conservation of temperate and boreal softwood riparian woodland are a strict protection of remaining sites, especially from expansion of land uses for urbanisation and agriculture, but also from *Populus* plantation, from damming and river regulation, and conservation or improvement of water quality. A free flowing river should experience floods allowing aggradation and nutrient- deposition, soil and vegetation rejenuvation (erosion and destruction of trees).

### List of conservation and management needs

#### Measures related to forests and wooded habitats

Restoring/Improving forest habitats
Adapt forest management

#### Measures related to wetland, freshwater and coastal habitats

Restoring/Improving water quality
Restoring/Improving the hydrological regime

#### Measures related to spatial planning

Legal protection of habitats and species

### Conservation status

Annex 1:

91E0: ATL U2, ALP U2, BLS U1, BOR U2, CON U2, MED U1, PAN U1

92A0: ALP U1, ATL U1, BLS U1, COn U2, MED U2, PAN U1, STE U1

### When severely damaged, does the habitat retain the capacity to recover its typical character and functionality?

Restoration should involve improving the hydrological functioning, by restoring natural river banks and removing dams.

### Effort required

| 20 years | 50+ years |
|---|---|
| Through intervention | Naturally |

## Red List Assessment

### Criterion A: Reduction in quantity

| Criterion A | A1 | A2a | A2b | A3 |
|---|---|---|---|---|
| EU 28 | -13,4 % | unknown % | unknown % | unknown % |
| EU 28+ | -13,8 % | unknown % | unknown % | unknown % |

There is overall only slight recent past decline in quantity, but rather different situations are seen between countries: the NT category would be reached in Switzerland, Slovenia and Bosnia and Herzegovina, VU in Finland, EN in Slovakia and CR in Czech Republic.

### Criterion B: Restricted geographic distribution

| Criterion B | B1 | | | | B2 | | | | B3 |
|---|---|---|---|---|---|---|---|---|---|
| | EOO | a | b | c | AOO | a | b | c | |
| EU 28 | >50000 Km$^2$ | Yes | No | No | >50 | Yes | No | No | No |
| EU 28+ | >50000 Km$^2$ | Yes | No | No | >50 | Yes | No | No | No |

Both EOO, AOO and number of locations exceed the limits of vulnerability.

### Criterion C and D: Reduction in abiotic and/or biotic quality

| Criteria C/D | C/D1 | | C/D2 | | C/D3 | |
|---|---|---|---|---|---|---|
| | Extent affected | Relative severity | Extent affected | Relative severity | Extent affected | Relative severity |
| EU 28 | 35 % | 55% % | unknown % | unknown % | unknown % | unknown % |
| EU 28+ | 34 % | 54% % | unknown % | unknown % | unknown % | unknown % |

| Criterion C | C1 | | C2 | | C3 | |
|---|---|---|---|---|---|---|
| | Extent affected | Relative severity | Extent affected | Relative severity | Extent affected | Relative severity |
| EU 28 | unknown % | unknown % | unknown % | unknown % | unknown % | unknown % |
| EU 28+ | unknown % | unknown % | unknown % | unknown % | unknown % | unknown % |

| Criterion D | D1 | | D2 | | D3 | |
|---|---|---|---|---|---|---|
| | Extent affected | Relative severity | Extent affected | Relative severity | Extent affected | Relative severity |
| EU 28 | unknown % | unknown% | unknown % | unknown% | unknown % | unknown% |
| EU 28+ | unknown % | unknown% | unknown % | unknown% | unknown % | unknown% |

The trend in quality for the last 50 years is calculated using territorial data from 88% of the reported area in EU28 and 84% for EU28+.

### Criterion E: Quantitative analysis to evaluate risk of habitat collapse

| Criterion E | Probability of collapse |
|---|---|
| EU 28 | unknown |

| Criterion E | Probability of collapse |
|---|---|
| *EU 28+* | unknown |

There is no quantitative analysis available that estimates the probability of collapse of this habitat type.

## Overall assessment "Balance sheet" for EU 28 and EU 28+

|  | A1 | A2a | A2b | A3 | B1 | B2 | B3 | C/D1 | C/D2 | C/D3 | C1 | C2 | C3 | D1 | D2 | D3 | E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *EU28* | LC | DD | DD | DD | LC | LC | LC | NT | DD | DD | DD | DD | DD | DD | DD | LC | DD |
| *EU28+* | LC | DD | DD | DD | LC | LC | LC | NT | DD | DD | DD | DD | DD | DD | DD | DD | DD |

| Overall Category & Criteria | | | |
|---|---|---|---|
| EU 28 | | EU 28+ | |
| Red List Category | Red List Criteria | Red List Category | Red List Criteria |
| Near Threatened | C/D1 | Near Threatened | C/D1 |

## Confidence in the assessment
Medium (evenly split between quantitative data/literature and uncertain data sources and assured expert knowledge)

## Assessors
B. Renaux

## Contributors
Habitat definition : J. Rodwell & B. Renaux

Territorial data: P.A. Aarrestad, E. Agrillo, S. Armiraglio, S. Assini, F. Attorre, L. Aunina, S. Bagella, R-J. Bijlsma, C. Bita-Nicolae, J. Bölöni, G. Buffa, C. Giancola, J.A. Campos, A. Čarni, L. Casella, M. Chytrý, R. Delarze, M. Dimitrov, P. Dimopoulos, P. Finck, D. Gigante, C. Giancola, G. Giusso Del Galdo, N. Juvan, Z. Kącki, K.J. Kirby, T. Kontula, C. Marcenò, V. Matevski, N., F. Millaku, B. Nygaard, F. O'Neill, G. Pezzi, V. Rašomavičius, U. Raths, U. Riecken, S. Sciandrello, V. Sell, Z. Škvorc, A. Ssymank, V. Stupar, M. Valachovič, A. Van Braekel, B. Vandevoorde, N. Velkovski, D. Viciani, L. Wibail, W. Willner

Working Group Forests: F. Attore, R-J. Bijlsma, M. Chytrý, P. Dimopoulos, B. Renaux, A. Ssymank, T. Tonteri, M. Valderrabano

## Reviewers
J. Rodwell

## Date of assessment
14/10/2015

## Date of review
26/02/2016

## References

Boeuf R., Durand E , Hauschild R. 2007. *Phytoecological approach of the alluvial forest of Rhine river.* Lavoisier SAS. Tous droits réservésTockner K., Uehlinger U., Robinson C.T.. Rivers of Europe. Academic Press, 31 janv. 2009 - 728 pages

Carbiener R., 1970. Un exemple de type forestier exceptionnel pour l'Europe occidentale : la forêt du lit majeur du Rhin au niveau du fossé rhénan (Fraxino-Ulmetum Oberd 53) ; Intérêt écologique et biogéographique ; Comparaison à d'autres forêts thermohygrophiles ; Vegetatio, Acta Geobotanica, 18.3.

Vol. 20.

Dynesius M. & Nilsson C. Fragmentation and Flow Regulation of River Systems in the Northern Third of the World. Umeå University, Umeå, Västerbotten, Sweden. Science 11/1994; 266(5186):753-762.

Le Lay Y.-F. & Piégay H. 2007. - Le bois mort dans les paysages fluviaux français : éléments pour une gestion renouvelée, L'Espace géographique 1/2007 (Tome 36), p. 51-64. URL : www.cairn.info/revue-espace-geographique-2007-1-page-51.htm. last accessed : Feb. 19th 2016

Michles, H-G. & Aldinger, E., 2000.- Forstliche Standortsgliederung in der badischen Rheinaue - Allgemeine Forstzeitschrift AFZ Der Wald - Heft 15, Juli 2002 (Seite 811 - 815).Moss T. & Monstadt J. - Restoring Floodplains in Europe:Policy Contexts and Project Experiences. IWA publisher, 320 p.

Schnitzler-Lenoble A. 2007. Forêts alluviales d'Europe. Tec et Doc, Lavoisier. 387 P.