SURVEY OF FLOODPLAIN WOODLAND IN HARTSGRAVEL WOOD AREA, WEST SUSSEX

SURVEY BACKGROUND

Survey Date: 15/5/2008

Surveyor: Neil A Sanderson

History: the 1808 West Grinstead Ordnance Surveyors Drawing (**Map 1**) clearly shows Hartsgravel Wood as a woodland but, curiously, Alder Copse is not shown. This seems unlikely as Alder Copse looks very like an ancient woodland with Hornbeam, Bluebell and Anemone abundant on base rich slopes above the floodplain. It can not, however, be very old as there is a massive broken dam (pond bay) at the southern end of Alder Copse (TN14), which will have flooded the floodplain in both Alder Copse and the field east of Hartsgravel Wood. The dam is not shown on the 1808 map and appears to have broken a long time ago.

The 1879 6" Ordnance Survey map (**Map 2**) shows a very different situation, with Alder Copse in existence. Hartsgravel Wood also extended south of the river occupying all of the floodplain, this is not indicated in the 1808 map, but the surviving southern boundary suggests that this was the ancient boundary of the wood.

Since 1879, the southern floodplain woodland at Hartsgravel Wood has been cleared, leaving the old boundary bank and the associated boundary trees. The field between Hartsgravel Wood and Alder Copse, has also been planted with Poplar trees. Some Poplar planting had also occurred within the floodplain within Alder Copse, but the overstood coppice dominates and the wood is still largely semi-natural.

The northern floodplain within Hartsgravel Wood supports definite ancient floodplain woodland. There is also a narrow band of old woodland along the river, within the field between Hartsgravel Wood and Alder, which has every appearance of being ancient but is too narrow to show up on maps. The floodplain woodland with Alder Copse must post date the bursting of the ancient dam at the southern end, but looks to be older than implied by the 1808 map. It may also be ancient in the terms of the ancient woodland inventory if the dam was broken before 1600.

Very recently the woods surveyed, have become part of a wider area of countryside that has been put into a rewilding scheme; with extensive cattle grazing through the woodlands and fields.

DESCRIPTION OF VEGETATION

Introduction: the distribution of vegetation stands, quadrat locations and target notes are shown on **Map 3**. The vascular plants and terricolous bryophytes recorded are listed in **Species List 1**.

HARTSGRAVEL WOOD

Non Floodplain Woodland (W10b/6Dc) (TN 2): the ancient woodland to the north is on land that rises steeply out of the floodplain and is on quite acid soils. These support overstood hazel coppice with Oak standards (Peterken Stand Type: Lowland Birch – Sessile Oakwoods, 6Cb) with Wood Anemone in the ground flora (NVC: Quercus robur – Pteridium aquilinum – Rubus fruticosus Anemone nemorosa sub-community, W10b).

Levee Woodland (W8f & W8b) (TN 1, 3 & 4): the stream is meandering and quite deeply incised into the floodplain. This appears natural, and there was no evidence of drainage or channel deepening. The floodplain was therefore reasonably well drained, with alluvial gley soils with gleying at 20cm depth, rather than to the surface, and consisting of slit over stiff clay. Some areas of coarser topsoils occur nearer the edge of the channel, where material has washed in from the valley sides. There is only limited development of back swamp vegetation but some active flood channels were noted on the floodplain. There were some debris dams developing within the mainstream channel, with one clearly increasing out of bank flooding episodes.

The canopy and shrub layers are developed from over stoodcoppice, with Ash dominating the canopy, along with scattered Oaks. The shrub layer is quite open with Maple and Hazel prominent, some Wych Elm to the west and scattered Dog Wood, Hawthorn, Spindle, Holly, Blackthorn, Purging Buckthorn, Sallow and Elder. There are a few Alders along the river edge. In terms of the Peterken classification this produces Wet Ash – Maple Woods (2A) with Wet Ash – Wych Elm Woods (1B) to the west.

The bulk of the ground flora is dominated by Wild Garlic *Allium ursinum*, in the field layer along with species such as *Galium aparine*, *Glechoma hederacea*, *Lamiastrum galeobdolon* ssp *montanum*, *Mercurialis perennis* and *Veronica montana* (**HGQ1**). The ground layer has a sparse moss cover but with a good variety of species with the woodland moss *Cirriphyllum piliferum* frequent along with the common *Brachythecium rutabulum* and *Kindbergia praelongum*. (NVC: Fraxinus excelsior – Acer campestris – Mercurialis perennis Woodland, Allium ursinum sub-community, W8f). The ground flora is not a rich as has been seen in levee woodland where Wild Garlic (W8b) is absent. The cattle have had little effect on the ground flora but have opened up some paths through the Wild Garlic. Experience in floodplain woodland on the Avon Water, New Forest, suggests that by suppressing the Wild Garlic grazing may increase the floristic diversity of the ground flora. Wild Garlic disappears on the coarser soils on the edge of the floodplain producing slightly richer ground floras referable to NVC community Fraxinus excelsior – Acer campestris – Mercurialis perennis Woodland, Anemone nemorosa sub-community (W8b). This vegetation continues up the small tributary stream.

This is a very interesting site, these better drained soils are likely to be more typical, the majority now cleared floodplain woodland, and are a good example of hard wood floodplain woodland. The dominance of W8f is likely to reflect the strongly silty alluvial gleys, with W8b confined to gleys with coarser topsoils.

Cleared Woodland (TG17): the floodplain to the south has semi-improved grassland, with patches of Crosswort *Cruciata laevipes*.

Species: a full survey was carried out of the floodplain covering woodland vascular plants and all the ground living mosses (**Species List 1**). A total of 76 species were recorded from the floodplain woodland, including 68 vascular plants and 8 bryophytes. No nationally or county rare species were recorded, but 19 Ancient Woodland Vascular Plants (AWVP) were recorded. The total of AWVP is high given the small area of woodland involved.

Quadrat HGQ1

Species	**HGQ1**
TREES & TALL SHRUBS	
Acer campestre	*/4/*
Corylus avellana	*/*/4
Crataegus monogyna	*/*/2
Euonymus europaeus	*/*/1
Fraxinus excelsior	8/*/1
Prunus spinosa	*/*/1
Quercus robur	4/*/*
Rhamnus cathartica	*/*/4
Ulmus glabra	*/4/*
GRASSES	
Poa trivialis	4
OTHER VASCULAR PLANTS	
Alliaria petiolata	1
Allium ursinum	8
Anemone nemorosa	2
Arum maculatum	2
Galium aparine	3
Glechoma hederacea	4
Lamiastrum galeobdolon ssp montanum	3
Mercurialis perennis	5
Veronica montana	4
Viola sp	1
MOSSES	
Brachythecium rutabulum	2
Cirriphyllum piliferum	3
Kindbergia praelongum	5

Oxyrrhynchium hians	3
Plagiomnium undulatum	4
Thamnium alopecurum	2
Total No species:	26
GR (no GPS reception):	SU152 236
Soil:	Alluvial Gley
NVC:	W8f

Under TREES & TALL SHRUBS

8-2-1 = Canopy cover-shrub layer cover-field layer cover (* = no occurrence in this layer)

Quadrat HGQ2

Species	**HGQ2**
TREES & TALL SHRUBS	
Acer campestre	
Corylus avellana	*/5/*
Crataegus monogyna	*/5/*
Fraxinus excelsior	*/2/*
Ilex aquifolium	8/*/*
Prunus spinosa	*/1/*
Quercus robur	*/2/*
Sambucus nigra	2/*/*
GRASSES	*/2/*
Brachypodium sylvaticum	
Dactylis glomerata	4
Poa trivialis	2
OTHER VASCULAR PLANTS	9
Ajuga reptans	
Anemone nemorosa	3
Arctium minus	4
Cardamine pratensis	1
Cruciata laevipes	3
Galium aparine	4
Geum urbanum	2
Heracleum sphondylium	2
Hyacinthoides non-scripta	1
Lamiastrum galeobdolon ssp montanum	1
Mercurialis perennis	3
Rubus fruticosus	4
Stellaria holostea	2
Urtica dioica	1
Veronica montana	2
MOSSES	6
Cirriphyllum piliferum	
Kindbergia praelongum	2
Oxyrrhynchium hians	2

Total No species:	29
GPS:	SU15449 23681 ±18m
Soil:	Alluvial Gley
NVC:	W8b

Under TREES & TALL SHRUBS

8-2-1 = Canopy cover-shrub layer cover-field layer cover (* = no occurrence in this layer)

FIELD EAST OF HARTSGRAVEL WOOD

Non Floodplain Community (W21) (TN 7): the majority of this field is within the floodplain, but the northern side is a bank above the floodplain. The latter is dominated by Hawthorn scrub (NVC: Crataegus monogyna – Hedera helix Scrub, W21).

Poplar Plantation (TN 6): the former flood meadow has been planted with Poplar, which has been partly felled and is quite open. The ground flora is dominated by tall course vegetation with an abundance of *Rumex sanguineus*, *Pteridium aquilinum*, *Filipendula ulmaria* and *Arrhenatherum elatius*. This has no clear place in the NVC classification. There is some Hawthorn invasion.

Levee Woodland (W8f) (TN 5): close to the river is a strip of old woodland of Hazel, Ash, Alder and Maple, with a few Oaks, including a post mature stag headed Oak (Peterken Stand Type: Neutral to Alkaline Valley Alderwoods on Mineral Soil, 7Ab). This has a Wild Garlic dominated flora very similar to the floodplain woodland in the adjacent Hartsgravel Wood (NVC: Fraxinus excelsior – Acer campestris – Mercurialis perennis Woodland, Allium ursinum sub-community, W8f).

Species: a full survey was carried out of the floodplain covering the floodplain recording vascular plants and all the ground living mosses (**Species List 1**). A total of 51 species were recorded from the floodplain woodland, including 50 vascular plants and one bryophytes. No nationally or county rare species were recorded. Six Ancient Woodland Vascular Plants (AWVP) were recorded.

ALDER COPSE

Non Floodplain Woodland (W10b, & W8b) (TN 11, 12 & 14): the higher ground to the north has more acidic woodland (W10b/6Dc) but in other areas more gentle base rich clay supports over stool Hornbeam – Ash coppice (Peterken Stand Type: Pedunculate Oak – Hornbeam Wood, Ash – Maple variant, 9Ab) with a W8b ground flora. The avoidance of the floodplain by Hornbeam is marked and sharp, and is characteristic behaviour. The absence of Hornbeam is a classic feature of hardwood floodplain forest.

Levee Woodland (W8f) (TN 8, 10, 13 & 16): Alder Copse includes a broad section of floodplain woodland. The river is deeply incised in a natural channel. The river floods out of channel, as water washed wood debris, where present on the floodplain. A side channel to the north has been straightened, cutting off the natural meandering channel. The soil is an alluvial gley, but with a clayish top soils rather than the silty one found in Hartsgravel Wood, possibly reflecting the past history of this part of the wood as a mill pond.

To the north this consists of an Alder – Ash canopy with some surviving planted Poplar over a thin understorey of Hazel and Hawthorn (Peterken Stand Type: Neutral to Alkaline Valley Alderwoods on Mineral Soil, 7Ab) (**ACQ1**). In the rest of the stand, the Alder is replaced by Wych Elm (Wet Ash – Wych Elm Woods, 1B) (**ACQ2**). Maple is present but is confined to the river bank. The ground flora is overwhelmingly dominated by Wild Garlic, leaving little room for other species, producing rather species poor ground floras (NVC: Fraxinus excelsior – Acer campestris – Mercurialis perennis Woodland, Allium ursinum sub-community, W8f). Nettle is more prominent to the north and with the Alder this area is somewhat transitional to Nettle Woodland (Alnus glutinosa – Urtica dioica Woodland typical sub-community, W6a) but the abundance of Wild Garlic rules out assigning this stand to this community.

An open area (TN10) produced by felling Poplars is dominated by Nettle and Wild Garlic. As in Hartsgravel Wood, the small floodplain on a tributary stream supports W8b/2A type woodland.

It will be interesting to see if grazing actually diversifies the ground flora here by reducing Wild Garlic cover. Like Hartsgravel, this is an interesting example of a hardwood floodplain forest, but also grades towards softwood floodplain forest to the north. The sharp transition to upland base rich woodland marked by the appearance of Hornbeam is an impressive conformation of descriptions of floodplain woodlands in Peterken & Hughes (1995).

Nettle Woodland (W6a) (TN14): a hollow below the pond bay, probably a borrow pit, is mainly dominated by planted Polar, with some Alder over a ground flora dominated by Nettle (Alnus glutinosa – Urtica dioica Woodland typical sub-community, W6a).

Species: a full survey was carried out of the floodplain covering woodland vascular plants and all the ground living mosses (**Species List 1**). A total of 43 species were recorded from the floodplain woodland, including 41 vascular plants and two bryophytes. No nationally or county rare species were recorded, but 12 Ancient Woodland Vascular Plants (AWVP) were recorded. The total of AWVP is lower than in the more varied Hartsgravel Wood, which is probably older and less dominated by Wild Garlic.

Quadrat ACQ1

Species	**ACQ1**
TREES & TALL SHRUBS	
Alnus glutinosa	8/*/*
Corylus avellana	*/3/*
Crataegus monogyna	*/1/*
Fraxinus excelsior	7/*/1
Populus cultivar	4/*/*
UNDER SHRUBS	
Poa trivialis	4
OTHER VASCULAR PLANTS	
Alliaria petiolata	1
Allium ursinum	8
Cardamine flexuosa	3
Galium aparine	5
Urtica dioica	6
Veronica montana	1
MOSSES	
Brachythecium rutabulum	2
Kindbergia praelongum	3
Total No species:	14
GPS:	SU15621 23687 ±24m
Soil:	Alluvial Gley
NVC:	W8b

Under TREES & TALL SHRUBS
8-2-1 = Canopy cover-shrub layer cover-field layer cover (* = no occurrence in this layer)

Quadrat ACQ2

Species	**ACQ2**
TREES & TALL SHRUBS	
Alnus glutinosa	*/2/*
Corylus avellana	*/4/*
Crataegus monogyna	2/*/*
Fraxinus excelsior	1/*/*
Populus cultivar	5/*/*
Ulmus glabra	7/*/*
UNDER SHRUBS	
Poa trivialis	3
OTHER VASCULAR PLANTS	
Allium ursinum	10
Cardamine flexuosa	3
Galium aparine	2
Ranunculus ficaria	1
Urtica dioica	2
MOSSES	
Brachythecium rutabulum	1
Kindbergia praelongum	2
Plagiomnium undulatum	1
Total No species:	15
GR (no GPS reception):	SU156 235
Soil:	Alluvial Gley
NVC:	W8b

Under TREES & TALL SHRUBS
8-2-1 = Canopy cover-shrub layer cover-field layer cover (* = no occurrence in this layer)

COMMENTS

Floodplain Woodland: the floodplain woodland in the Hartsgravel Wood area is a significant site. The dominance of hardwood floodplain forest (W8) over wet woodland is likely to be much more typical of the majority of floodplain woodland than the typical surviving or developing floodplain woodlands. Usually, wetter areas within floodplains have been abandoned or survived as woodland, while the more typical summer dry floodplain soils maintained in agriculture. The floristic differences with hardwood floodplain forest stands known to the author in Hampshire and Isle of Wight are interesting. In these W8b type ground floras are predominant, but in the clayier alluvial soils of the low Weald, W8f with Wild Garlic dominant appear more typical. The frequency of Wych Elm has also been noted in a well developed Isle of Wight site (Briddlesford Woods) in the hardwood floodplain stand there and is likely to have been a typical feature. This species is present but rare in the more acid New Forest examples.

The total flora recorded from the floodplain woodlands was 100 species, including 92 vascular plants with eight bryophytes. These include 22 AWVP ancient woodland indicators, a good total for a relatively small area of woodland.

Management: the rewilding is a very interesting experiment and should not represent a problem for the floodplain woodland here. The stands are still young growth and non intervention will allow missing features such as old trees and dead wood to develop. Grazing is not likely to be a negative problem at the light and extensive level apparent at the time of survey. The best surviving hardwood floodplain forests in the lowlands are in the New Forest, which are old growth pasture woodlands. These are exceptionally species rich, in spite of, and possibly because off, the grazing. For example, within woods along the Avon Water in the New Forest, grazing clearly increases vascular plant species diversity by reducing Wild Garlic cover. Currently, however, the quantity of fallen dead wood is low and in New Forest dead wood tangles are an important feature is protecting more grazing sensitive species. This would be partly solved by felling the remaining Poplars cultivars in Alder Copse and leaving the felled material.

REFERENCE

Peterken, G. F. & Hughes, F. M. R. (1995) Restoration of floodplain forests in Britain. *Forestry* **68**:187-202.

SPECIES LIST 1
Species Recorded from Floodplain 2008

Species	AC	Comment	EHG	Comment	HG	Comment	AWVP
TREES & TALL SHRUBS							
Acer campestre	O		F	By river	A		1
Alnus glutinosa	A		O	By river	O		
Carpinus betulus	R						1
Cornus sagniunea	R				R		
Corylus avellana	F		F	By river	F		
Crataegus monogyna	F		F		O		
Euonymus europaeus	R				R		
Fraxinus excelsior	A		F	By river	D		
Ilex aquifolium					R		1
Picea sp			R				
Pinus nigra ssp laricio	R						
Populus cultivar	A		A	Planted trees			
Prunus spinosa	S		O	By river	O		
Quercus robur	R		R	By river, old tree	O		
Rhamnus cathartica					O		
Salix cinerea ssp oleifolia			R		R		
Salix fragilis	R						
Sambucus nigra			R	By river	R		
Ulmus glabra	F				O		1
UNDER SHRUBS							
Ribes uva-crispa					R		
Rosa arvensis					R		1
Rosa canina agg					R		
GRASSES							
Agrostis stolonifera			F				
Alopecurus pratensis			O				
Arrhenatherum elatius			F	Prominent in open	O	River bank	
Brachypodium sylvaticum	R		O	By river	O		
Bromopsis ramosa			R		R		1
Dactylis glomerata			O	By river	R		
Festuca gigantea	R	River bank			R		1
Poa nemoralis					R	River bank	1
Poa trivialis	F		F		A		
OTHER VASCULAR PLANTS							
Adoxa moschatellina					O		1
Ajuga reptans			O		O		
Alisma plantago-aquatica					R		
Alliaria petiolata	O		R		O		
Allium ursinum	D		F	By river	D		1
Anemone nemorosa	R				F		1
Angelica sylvestris	R	River bank	R				
Anthriscus sylvestris	O		O	By river			
Arctium minus			F		O		
Arum maculatum					O		
Callitriche stagnalis					R	Flood channel	
Cardamine flexuosa	F		O	By river	O		
Cardamine pratensis					O		
Carex pendula	O	River bank	O	By river	O		1
Chrysosplenium oppositifolium	R						1
Circaea lutetiana	R		R				

Cirsium arvense	R		O				
Cirsium vulgare					R	Cattle track	
Cruciata laevipes			F		R		
Dryopteris filix-mas			R	By river	R		
Euphorbia amygdaloides					R		1
Filipendula ulmaria	R		A	Prominent in open	O		
Galium aparine	F		F		F		
Galium palustre	R						
Geum urbanum			O		O		
Glechoma hederacea			F		F		
Hedera helix					R		
Heracleum sphondylium			O	By river	R		
Humulus lupulus			R	By river	R		
Hyacinthoides non-scripta					R		1
Iris pseudacorus	R				R	Flood channel	
Juncus effusus			O		R		
Lamiastrum galeobdolon ssp montanum	O	River bank			F		1
Lychnis flos-cuculi	R						
Lysimachia nemorum	R						1
Mentha aquatica			O				
Mercurialis perennis			F	By river	A		
Myosotis arvensis			R				
Myosotis scorpioides	R						
Oenanthe crocata	R		O		O	River bank	
Persicaria maculosa	R						
Phyllitis scolopendrium					R		1
Plantago major			R				
Polystichum setiferum	R	River bank			R	River bank	1
Primula vulgaris					R		1
Prunella vulgaris					R	Cattle track	
Pteridium aquilinum			A	Prominent in open	R		
Ranunculus auricomus			R	By river			1
Ranunculus ficaria			O	By river	O		
Ranunculus repens			O		R	Cattle track	
Rubus fruticosus					O		
Rumex obtusifolius			R	By river			
Rumex sanguineus			D	Prominent in open	O		
Scrophularia auriculata	R		R	By river	O		
Sonchus arvensis			R				
Stellaria holostea					R		
Taraxacum sp.			R				
Urtica dioica	F		F		R		
Veronica hederifolia					O		
Veronica montana	O		O	By river	A		1
Viola riviniana					O		
MOSSES							
Brachythecium rutabulum	O				F		
Cirriphyllum piliferum			O	By river	F		
Fissidens taxifolius					O		
Kindbergia praelongum	F				F		
Oxyrrhynchium hians					F		
Plagiomnium undulatum					F		
Thamnium alopecurum					F		
LIVERWORTS							
Lunularia cruciata					R		

Totals 100	43		54		76		
AWVP	12		6		18		22

AC = Alder Copse, EHG = Field east of Hartsgravel Wood & HG = Hartsgravel Wood

MAP 1
1808 West Grinstead Ordnance Surveyors Drawing

MAP 2
1879 6" Ordnance Survey

MAP 3
Vegetation Map

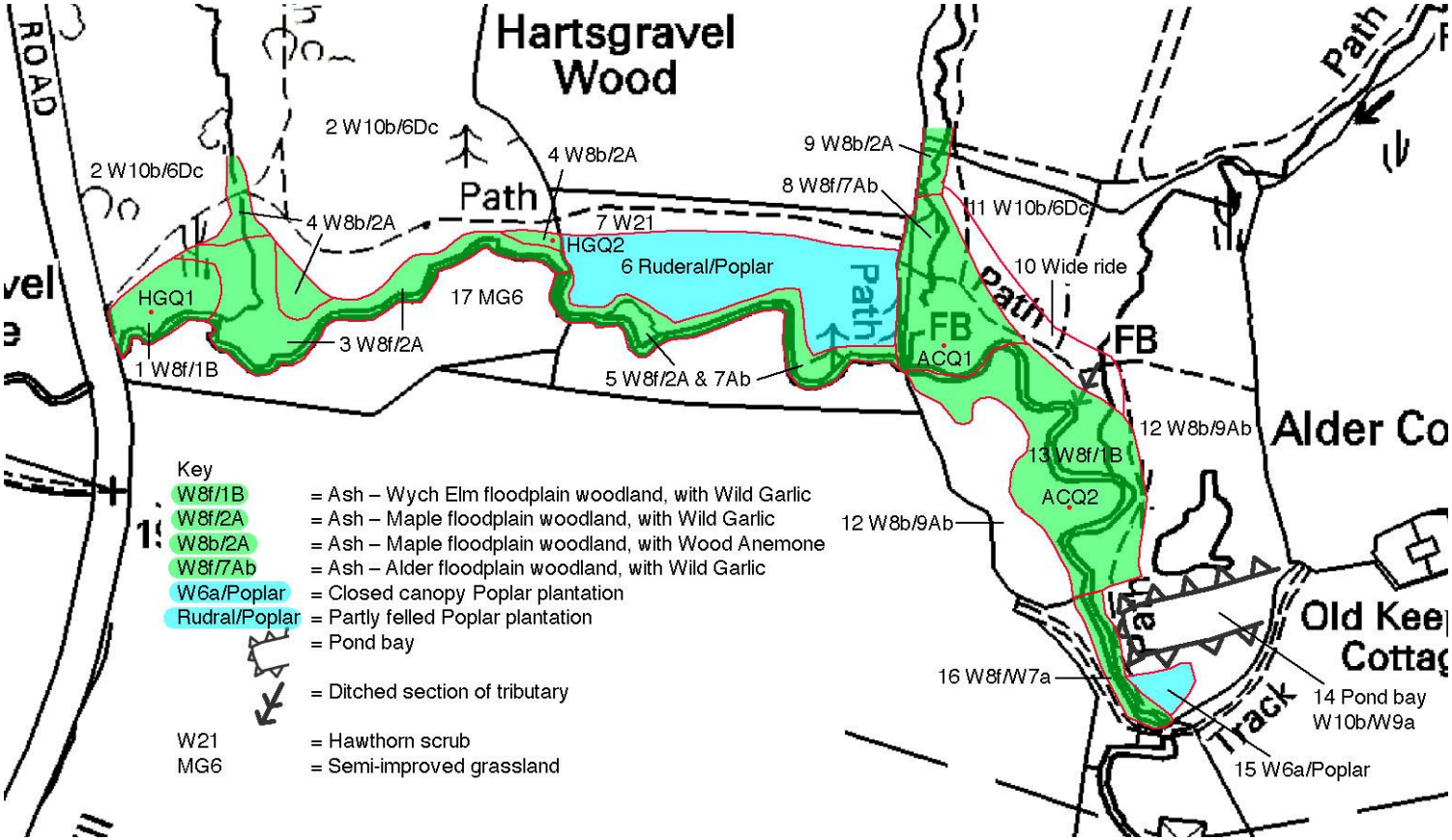

Photo 1. Hartsgravel Wood: floodplain woodland and the naturally incised stream, floods do overtop the bank but the woodland is reasonably well drained between floods. This supports hardwood floodplain woodland dominated by Ash with Hazel, Maple and Wych Elm, over a Wild Garlic dominated ground flora (W8f/1B). The latter reflects the heavy topsoils of low Weald; more loamy alluvial gleys and brown earths support W8b vegetation with Anemone replacing the Wild Garlic.

Photo 2. Hartsgravel Wood: a debris dam forming, which is forcing more water over the bank during floods and increasing floodplain dynamics. Such features were rare in the recent past, when rivers were more highly managed, and should be retained where possible.

Photo 3. Field east of Hartsgravel Wood: a poplar Plantation on a former flood meadow, now partly felled and dominated by ruderal vegetation. There is a band of Ash – Maple – Hazel – Alder riverine woodland (W8f/7Ab) in the back ground lining the river.

Photo 4. Alder Copse: an interesting riverine woodland formed in the bed of a presumably medieval mill pond. Garlic is even more dominant in the more clay rich former pond slit than in Hartsgravel Wood (W8f/1B & 7Ab). Area cleared of Poplar in background.

Photo 5. Alder Copse. Looking south across the stream to floodplain woodland of Ash – Hazel – Wych Elm (W8f/1B), Hornbeam stands on slopes behind (W8b/9Ab).

Photo 6. Alder Copse. Looking north across the stream, where an open section in the Ash – Hazel – Maple (W8f/2A) floodplain woodland, allows the sharp change to Ash – Hornbeam stands on slopes behind (W8b/9Ab) to be clearly seen.

Photo 7. Alder Copse. Looking up stream, just below the broken pond bay (mill dam), visible to the right with a massive Hornbeam stool. Ash – Hazel – Maple (W8f/2A) floodplain woodland, beyond and an incipient debris dam forming in foreground.