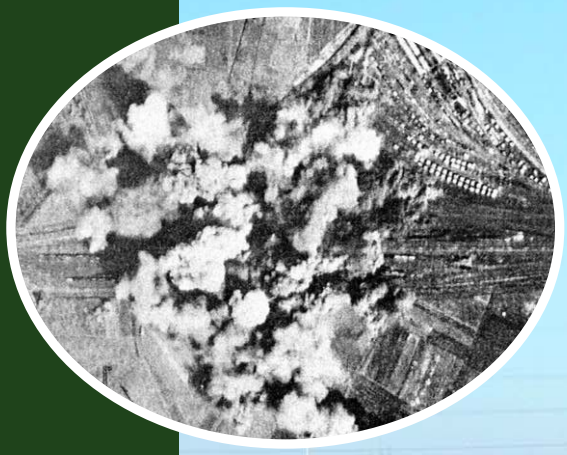
TOMMELEN

SCARS OF WAR CONTAIN A SIGNIFICANT WILDLIFE RESOURCE



EPCN
European Pond
Conservation Network

Letter of Support from the European Pond Conservation Network

Ponds are small bodies of water which have characterised much of the European landscape for many centuries. Research has shown that they are a significant wildlife resource, very high when compared to other water bodies. However, the number of ponds continues to decline as a result of agricultural intensification and urban development and, during the twentieth century, as many as 90% have been lost in some countries, with most countries in western Europe recording a loss in excess of 50%. Apart from their wildlife value, ponds also need to be valued in terms of their historical origins and cultural value, as distinctive features of local landscapes, their visual attraction and the knowledge that they can help local people keep in touch with nature.

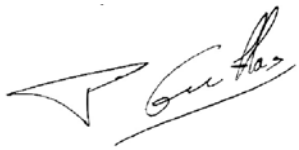
The pond complex at Tommelen represents a unique landscape in which catastrophic events of 1944 gave birth to an area which has become a highly significant wildlife resource. Conservation of this area is highly significant, even at the European level. As such, every effort should be made to conserve the area, not only as an area of high wetland biodiversity, but also as a distinctive landscape which contains a valuable historic record for the citizens of Hasselt and for the allied airmen who took part in the bombing raids during the closing months of the Second World War.

The European Pond Conservation Network (EPCN; http://www.europeanponds.org) was established in Geneva in 2004 and is a growing organization representing wetland and landscape scientists from universities, research organizations and conservation bodies from across the continent. The overall mission of the EPCN is to promote awareness, understanding and conservation of ponds in a changing European landscape and is therefore very pleased to support Natuurpunt and the City of Hasselt in any attempt to secure the long term future of this valuable site.

Yours sincerely,







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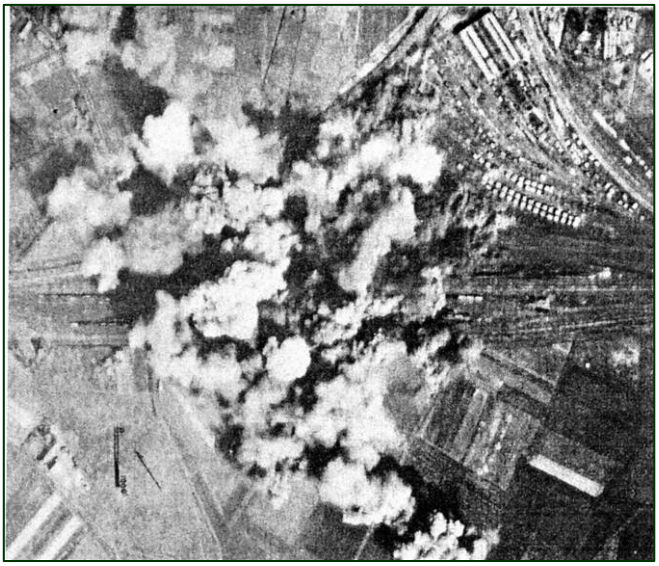
April 8th 1944

Kruitwit stofschuim
Iriserende stilte
Lichtspoor van smart
En smeulend verlangen naar
Vrede

(L. Vandenbosch)

INTRODUCTION

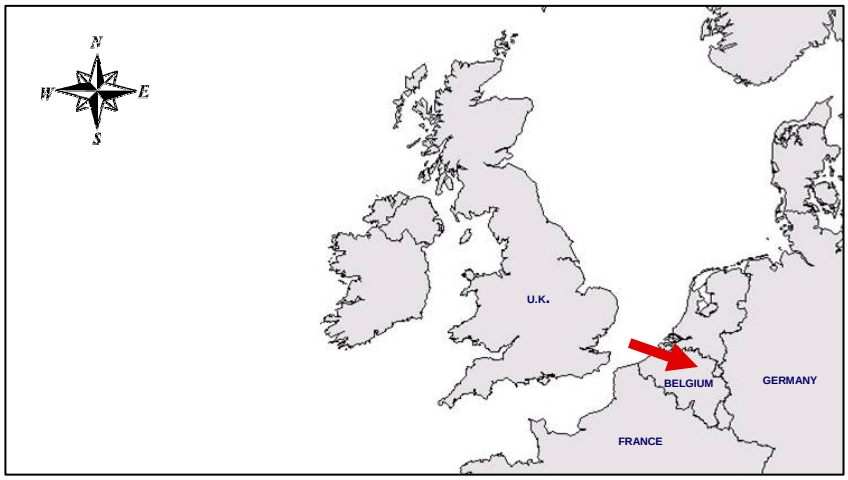
European pond loss and its consequences for biodiversity are well documented yet coherent pond conservation strategies remain elusive. A key to successful conservation is mobilising stakeholder interest. In many cases there is potential for integrating a site's cultural-historical significance with its conservation importance to promote stakeholder awareness and conservation action. Many ponds are important historic features both in their own right, and as a result of their structure and sediments which may contain valuable information about the history of the site and the surrounding land. Ponds were created for a great diversity of agricultural and industrial purposes, particularly during the eighteenth and nineteenth centuries, and were a vital ingredient to local economies across the continent. They form an integral part in folk tale, myth and modern "urban" legend yet, all too often, historical and cultural association is often neglected[1]. Apart from agricultural and industrial uses, ponds have also been created as a result of other events. Of these, there are a number of cases where pond creation has occurred as result of large-scale destruction caused by bomb and shell craters associated with military operations. The pond complex at Tommelen in the province of Limburg in eastern Belgium provides one of the best remaining examples in Europe of this pond type which was created during the latter stages of the Second World War in 1944.



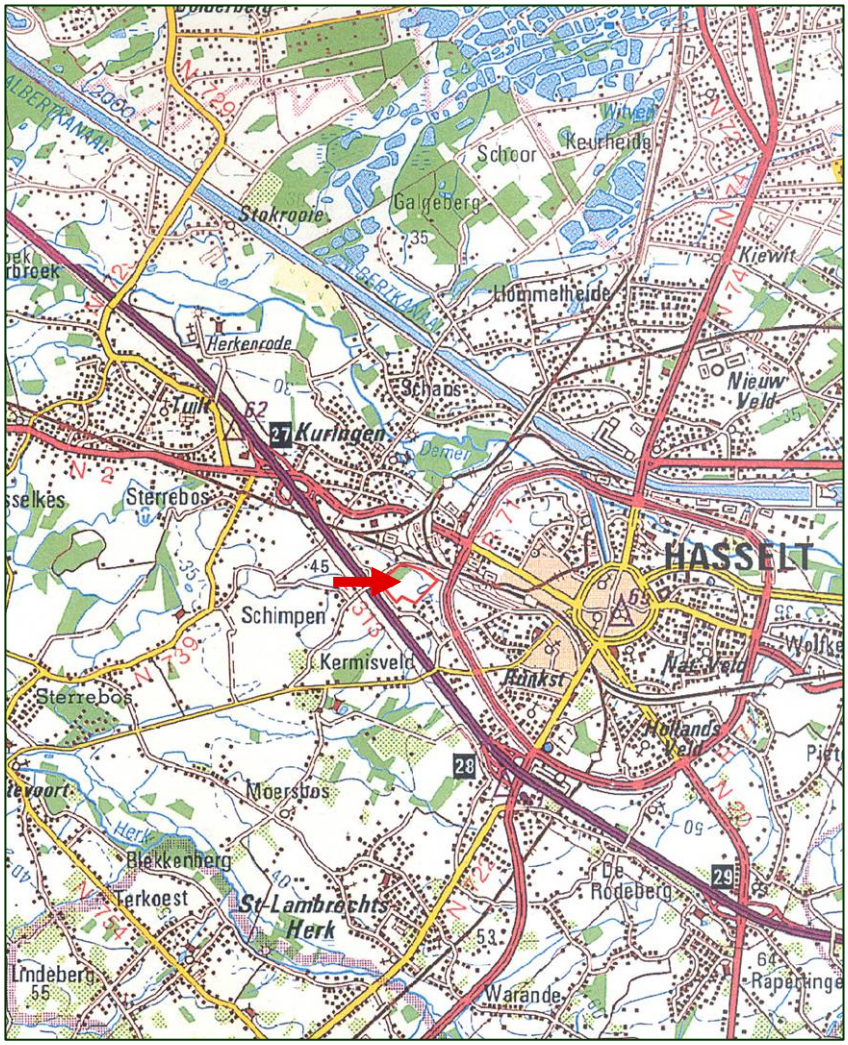
Aerial photo of the marshalling yard in Hasselt taken from an American B-26, on 8th April 1944

SETTING

The Tommelen pond complex is located on the western edge of the City of Hasselt in Belgian province of Limburg. As capital of the province, Hasselt has a population of 68,000 and is located 70 kilometres east of Brussels, in the Maas-Rhine region. The city is an important administrative centre as well as a commercial one.



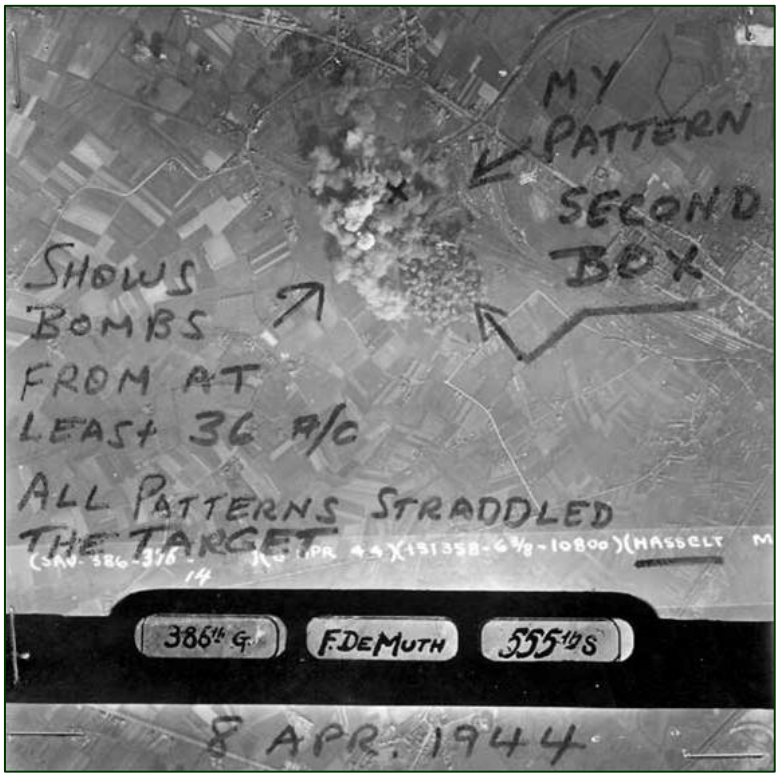
Location of Tommelen, to the west of Hasselt



Topographic map (scale 1/100.000 , NGI, GIS-Vlaanderen, 1986-1990)

HISTORY OF THE AREA

During World War II more than two million bombs were dropped on Europe by the US alone[2]. In Belgium this caused up to 30,000 civilian fatalities, many more injuries and a significant impact on the social psyche. In preparation for D-Day, Europe's rail network was targeted intensively. Belgium's rail network was then the densest on earth (around 17km of track per 100 km², 58.3% of it multi-tracked[3]). A key rail intersection and marshalling yards were located at Hasselt. Between 13.10 and 14.00, April 8th 1944, these were attacked by 198 B-26 bombers, and 32 P-47 Fighter-bombers of the US 9th Army Air Force[4]. On April 10th, 19th, 21st and on May 13th the station and the surrounding area were bombed again[5]. Civilians, railway infrastructure and buildings suffered most from the attacks on April 8th and 10th.



Aerial picture at the moment of impact. This picture was later used as propaganda material and dropped behind the German lines.

"As a bombardier with the 575th Bomb Squadron, 391st Bomb Group, I participated in the April 8th 1944 attack at Hasselt. Our target was the marshalling yards. The bombs from the 1st box landed in the target area, but the 2nd box missed badly. This was my 8th mission of 70…"

Richard Brooks, US 9th Army Air Force, Rtd.

HISTORY OF THE AREA

The first formation on April 8th hit the target, destroying or seriously damaging 230 wagons and locomotives, damaging track and railway buildings[5]. Subsequent formations, hampered by smoke and dust, missed. Bombs fell on civilian areas, killing 56 people, wounding 40 others and destroying 22 houses[6]. Many fell on pastureland around the marshalling yards. Also the subsequent air raid of April 10th took a heavy toll, especially in the direction of the city centre. Luckily most civilians were alert or already left the distressed area and fewer lives were lost in this attack.

... I remember that day vividly. I lay on my back in the grass when the sirens went off. We did not know what was happening, because it was the first time we were bombed. 'Gosh,' I said, 'All English planes that drop Easter eggs!' We ran down the Beukenstraat on our clogs and saw some people hiding in the ditch. 'Drop to the ground,' they were yelling. At home, my mother was worried sick and I really caught it. **– A. Feytons**[6]

... We were just finishing the soup when the sirens of the railway company went off. Once outside, we saw different planes diving downwards. 'This is not good, this is not good,' our mother said and shortly afterwards we heard a hammering noise. As soon as possible we dove into the basement to find some shelter. … We knew that something was coming, because they warned us on the radio. We had an 'American Bosh', and always tried to reach an English radio station: 'People, people of Western Europe, for the welfare of the war and for the progress of the liberation we have to bomb some specific targets. Watch out for factories, railway junctions and bridges.' **– Bonne**[6]

...During many months the whole city slept in basements and bus shelters. Everybody was in fear and prayed constantly. The religious, half-religious and even the free-thinking, joined in. Our district was completely deserted. We also fled the city, but each week I returned to look after the vegetable garden, which was an important task at that time. The city was so quiet that it was a relief to hear the meow of some stray cats. **– W. Greven**[6]

...The moment I came across the railway, I heard: 'wow wow wow.' 'Bombers!' I thought, because I recognized the anti-aircraft guns. The level crossing keeper said he saw some parachutes in the distance, but it appeared to be bombs that were falling towards the marshalling yard of Kuringen. 'God Almighty,' I said, 'my parents inlaw live overthere'. I cycled as fast as possible in the direction of the inferno. From afar, a cloud of dust emerged and out of it came several people carrying others. Most of them wore German uniforms and crawled out of a train that was seriously hit . The front of the train pointed to the sky and from each side people jumped out. After a second strike, the house of my parents in-law was completely destroyed. It is difficult to describe what I witnessed that day. The only way I can express this event is by making a painting out of it, and I maybe will do this one day. **– E. Borremans**[6]

...This time it was even worse. Underneath, the ground was trembling while the machine-guns were rattling. Our bodies were shaking all over and the number of impacts were uncountable. The dismal howling of the airplanes was making me sick. I didn't believe that there was somebody, no matter how strong he was, who could be immune to all this? All kind of questions entered my mind: 'Why do we have to endure this? We are being bombed by Americans and by the Englander, they are our allies, aren't they?' **– J. Berx**[7]

HISTORY OF THE AREA

Between the 8th of April and 28th of May Hasselt was bombed fifteen times (Annex I). Five of these strikes were concentrated on the marshalling yard and its close surrounding. The consequences for the civilians were tragical. In Hasselt and Kuringen 107 civilians were killed and 144 got injured. Also the material damage was enormous: in total 454 houses were totally destroyed or heavily damaged and many more suffered a minor degree of damage.

One of the commanders of these squadrons was Major Hair. He explained why these types of strikes were destructive on a relative large scale around the target. If a target of two hectares needed to be destroyed, than it was flown over by a formation that covered many more hectares. The moment the commander, who is always flying in the centre of the formation, spots the target he gives the order 'release bombs' to all planes simultaneous. The result is clear. Most likely, the target will be destroyed, but inevitable a lot of damage is done to the surrounding area.

A complete assessment of the damage on the railway company and the surrounding workshops in Hasselt can still be retrieved in the files of the NMBS, the national railway company. The railway complex got 156 direct hits. Most of them (128) were concentrated on the depot of the locomotives and on the workshops of the wagons as well as on a German transport of troops that was standing still in the station, south of the workshops[8]. An overview of the different bombardments on the city of Hasselt is represented in Annex I.

CURRENT SITUATION

Over time, the majority of the bomb craters filled in. Nevertheless, more than 110 were preserved, forming permanent or seasonal ponds and creating a diverse and unique wetland habitat. The site's 110 ponds lie within an area of 11.86 ha (i.e. around 10 ponds/ha). The main vegetation is species rich, rough grassland (7.58 ha), of which 0.67 ha is planted with more than seventy standard trees bearing old fruit varieties. The remaining area of 4.28 ha consists of woodland with willow, birch, oak and till recently with a poplar plantation. Aiming for an improvement of the water management of the area, the poplar trees were recently removed and by doing so, also a number of large ponds could be restored. To minimize the disturbance from the railway and surrounding roads, a buffer of indigenous trees will be planted. At the moment, the management consists of dredging of the ponds and of annual grazing by Galloway cattle and mowing to prevent forestation and natural succession. The central part of the pond complex is only accessible by guided tours.

Aerial view of the pond complex of Tommelen (January 2007)

The land is owned by the City of Hasselt and was leased as pasture to farmers until 1995. From 1996 it was managed by Wielewaal. This nature conservation organization merged with Natuurreservaten under the name Natuurpunt, who are currently the leading nature conservation organization in Flanders in the field of nature conservation at the moment. The current lease agreement comes to an end in 2016.

In the beginning of the nineties, proposals surfaced for industrial development. A united action programme of local residents and members of 'Groencomité Hasselt' ensured a prolonged conservation of the area, but was not able to obtain an official designation for the

site as nature reserve. In 2004, new plans arose for a further expansion of the residential zone, including a part of the area. On the long term, this would destroy the ecological value of the area. Currently, this proposal has been countered after heavy protest by 'Natuurpunt' and 'Groencomité Hasselt'. An application for a designation as an official nature reserve was submitted in July 2006. The main objective is to optimize Tommelen as a hot spot for amphibians with, in the core area, a half open landscape in which the conservation of ponds and woody edges is central. In the northwestern and western areas a closed landscape is targeted, where woodlands and scrub can develop. In the application, both the ecological value and the historical importance are included. Contacts with associations of American veterans (like artillery man Richard Brooks and lieutenant-colonel 'Wally' Morgan, who led the bomb squadron on the 8th of April 1944) and with local people who witnessed the bombing can help to convince the citizens of Hasselt of the historical and cultural importance of this area. All the more, since a number of interviewees from Hasselt and the surrounding area were still strongly and emotionally affected by the memories of these tragic events.

ECOLOGICAL VALUE

The pond complex and the surrounding terrestrial biotopes have a high capacity to support a wide range of organisms, many of high conservation importance, particularly amphibians and macro-invertebrates. Large populations of six species of amphibians are still present in the fishless ponds: *Rana esculenta synklepton, Rana temporaria, Bufo bufo, Triturus alpestris, Triturus cristatus* and *Triturus vulgaris.* Tommelen is located at the geographical border of De Kempen and Vochtig Haspengouw. This also explains the uncommon combination of three newt species at the same location.

The Great Crested Newt is a European protected species which falls under the Habitat Directive and for whose preservation the allocation of special protected areas is required. The range of the species extends from Great Britain in the west across much of Europe north of the Alps and the Black Sea. Although the great crested newt can still be found in most provinces of Belgium, the distribution is fragmented and the potential habitat is reducing at a very high speed[9]. Because of the high density of ponds and their structural heterogeneity, Tommelen provides ideal conditions for the reproduction of the species. Therefore it is not surprising that this area houses the largest population of great crested newts in Flanders.

On European scale, populations of great crested newts, and amphibians in general, strongly declined during the last decades due to the degradation and reduction of their habitat (e.g. drainage and dropping groundwater levels). Increased land development pressure from population growth, agricultural intensification and expansion and even climate change[10] impose a serious threat to the survival of amphibians. To put a stop to the decline of amphibians and to ensure the prolonged existence of the great crested newt, there is need for a well-considered management strategy that protects the remaining pond landscapes (both ponds and the surrounding land) and creates additional ponds which are strategically located.

ECOLOGICAL VALUE

Despite the common history of the ponds, being created almost simultaneously, there is striking diversity in pond characteristics. Pond surface area and depth vary with the bomb size and overlapping craters. Crater depth is important in determining hydro-period - larger bombs created deeper craters, penetrating into the underlying clay - hence more permanent ponds. Smaller craters do not extend so far into the sub-soil and are more ephemeral in nature, so both permanent and temporary ponds were created.

The combination of both types of ponds nestled in natural grassland provides ideal conditions for dragon- and damselflies. A partial inventory has already revealed 13 species, which included the rare and threatened Brown Emerald Damselfly and the Emperor Dragonfly. Also butterflies like the Common Blue, the Holly Blue, the Hedge Brown and the Small Skipper are omnipresent.

Despite the fact that all ponds are located in the same meadow and have a similar age, there is still a wide variation in pH, conductivity, nutrient status, shading and litter input[11]. Field observations also indicate large dissimilarities in vegetation cover, with ponds displaying diverse and abundant submerged, floating, emergent and marginal vegetation in close proximity to sparsely vegetated ponds. In the entire area, more than 200 plant species are recorded (see appendix II). Some important species are: Broad-Leaved Pond Weed, Bladderwort, Water Starwort and Marsh St. Johns-wort. The marginal vegetation is mainly dominated by Soft Rush, but also Common Clubrush, Arrowhead and Unbranched Burr-reed occurred. The hedges, woody edges and forest in combination with the open grassland offer a suitable nesting and foraging place to a number of birds. Especially small songbirds, like the Meadow Pipit, Reed Bunting and the Nightingale occur in the site.

SCIENTIFIC VALUE

The high density of ponds (high number on a small scale) in Tommelen is quite exceptional in Belgium. The fact that all ponds have a similar origin and are situated in the same geographical context (soil type and ground quality) provides unique opportunities for fundamental and applied ecological research. That is why the pond complex, as a study area, will play an important role in a recently approved research project PONDSCAPE, a project sponsored by the Belgian Science Policy (2007-2011). One of the objectives of this project is to obtain insights into the factors that determine the differences in biodiversity among ponds and to investigate the main drivers that shape pond communities. This is especially relevant in an effort to test how total diversity within a pond complex can be increased by applying standard management techniques.

Aerial picture of the pond complex before the poplar plantation was cleared.

THREATS

Tommelen is strongly isolated. The site is sandwiched by the city on the western side, the E313 roadway, the N2 and the Hasselt ring road. Another significant barrier to dispersal is the railway and marshalling yards of the railway station. On a long term this isolation can seriously threaten species richness and ecological value of the site. Colonization of amphibians and other organisms is severely hampered and may not compensate for occasional stochastic extinctions. Further planned research should indicate to what extent isolation has already affected local communities and in time, the degree of connectivity with the low-lying grassland and ponds at the other side of the highway should be improved.

PERSPECTIVES

A number of undermetioned proposals relate to the complete pond complex, others are restricted to the land which was recently cleared of poplars. Access to the main body of the site and pond complex will be restricted as at present.

- Dedicated and designated nature conservation and heritage site
- Restoration of degraded ponds
- Improvement of the connectivity of the pond complex with Herkenrodebos and the expected city forest at the other side of the E313 highway, western of Tommelen.
- Improve the access to the site and parking where appropriate.
- Create a small environmental education centre, guided nature trail including pond creation and interpretation and erect a covered interpretation panel as a memorial to the events of 1944
- Prepare a teacher resource pack
- Healing/celebration/memorial sculpture
- Planting of ‘a Forest of Peace’ in the meadow close to the orchard by the Flemish Forestry Organization.
- Create a spotters tower

All the above proposals are dependent on available funding.

REFERENCES

(1) Boothby, J. (1998) Ponds, a search for significance. In: Boothby, J. (Ed.) Ponds and pond landscapes of Europe: Proceedings of the International Conference of the Pond Life Project, Maastricht, The Pond Life Project, UK.

(2) United States Army Airforces statictical sigest, World War II. (1945) Number of bombs dropped overseas, 1943 to 1945, Table 137. http://www.usaaf.net/digest/t137.htm.

(3) United States Army Air Forces. (1944) We're attacking the heaviest rail concentration on earth. Impact. Office of the Assistant Chief of Air Staff, Intelligence, Washington DC.

(4) United States Army Air Forces Combat Chronology. (1944) http://www.usaaf.net/chron/44/apr44.htm.

(5) Stadsarchief van Hasselt (1944) Beknopt overzicht van de luchtbombardementen tusschen 8 april en 28 mei 1944. Verslag nr. 547.91.

(6) Getuigenis afgenomen door Karin De Greeve voor Erfgoedcel Hasselt (2006).

(7) Berx J. (1944) Herinneringen '40-'44: De eerste oorlogsdagen, bommen op Kuringen en Hasselt tijdens de eerste dagen der bevrijding door de geallieerden.

(8) Sterken L. (1977) Toen kwam Hasselt aan de beurt. In: Oude dossiers weer open. Het Belang van Limburg 5 april 1977.

(9) Schops, I. (1999) Amfibieën en reptielen in Limburg: verspreiding, bescherming en herkenning. LIKONA, Genk, p. 51.

(10) Carey C. and M.A. Alexander (2003) Climate change and amphibian declines: is there a link? Diversity and distribution 9: 111-121.

(11) Poorters N. (2002) Invloed van de omgevingsfactoren op de aan- of afwezigheid van amfibieën. Case Study: poelengebied Tommelen. Master's thesis, Katholieke Hogeschool Limburg.

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European Pond Conservation Network:
http://www.europeanponds.org

Natuurpunt Hasselt-Zonhoven:
www.natuurpunthasseltzonhoven.be

Erfgoedcel Hasselt:
www.erfgoedcelhasselt.be

Laboratory of Aquatic Ecology & Evolutionary Biology (K.U.Leuven):
bio.kuleuven.be/eco

Hyla: amphibian & reptile study group:
www.hylawerkgroep.be

Limburgse Koepel voor natuurstudie:
www.limburg.be/likona

Royal Belgian Institute for Natural Sciences (RBINS): www.natuurwetenschappen.be

De stad Hasselt:
www.hasselt.be

The Flemish Governement:
http://start.vlaanderen.be

APPENDIX I: OVERVIEW AERIAL BOMBARDMENTS

From the archives of the city of Hasselt, excerpt from report no. 547.91:

A concise overview of the air raids between April 8th and May 28th 1944.

1st Bombardment: 8 April, 13.15, 13.50 and 14. The first strike was carried out by about 75 heavy bombers who flew over the city of Hasselt at an altitude of approximately 2000 meters. They dropped their bomb load on our territory on stretch of more than 150 ha and especially on the district of Kuringen and Runxter, in the close surrounding of the marshalling yards. Buildings situated more than 600 meters away from the target were hit.

2th bombardment: 10 April, 10.45. This bombardment was carried out by two subsequent waves of bombers. They flew over our territory in western direction and dropped their bomb load on the west side of the side of the city, nevertheless also some bombs were dropped in the Issebellastraat in the city centre.

3th bombardment: 19 April, 15. 30. Air attack on the marshalling yards with a light formation of fighter-bombers.

4th bombardment: 21 April, 10.30. This bombardment was the same as the previous one.

5eth bombardment: 11 May 23.50. Northeastwards of the city centre. Most severe bombardment up to now after a dogfight above Hasselt.

6th and 7th bombardment: 12 May, 10.45 and 17.20. Region of Kuringen, attack on the bridge of the railway across the Albertkanaal.

8th bombardment: 13 May, 0.38, Hundreds of bombs fell southwards of the marshalling yards in the farmlands around the buildings in the Tommelen- and Jodenstraat, in the neighbourhood of the Pietelbeekstraat and the railway Hasselt-Landen.

9th and 10th bombardment: 22 May, 15.15 and 18.07. Attack on the railway-bridge across the Albertkanaal

11th and 12th bombardment: 23 May, 15. 30 and 17. 05. The same target.

13th bombardment: 25 May, 11.07. The same target.

14th and 15th bombardment: 28 May, 10.00 and 16.40. The same target.

APPENDIX II: LIST OF SPECIES

BUTTERFLIES	
Anglais urticae	Small Tortoiseshell
Anthocharis cardamines	Orangetip
Aphantopus hyperantus	Ringlet
Celastrina argiolus	Holly Blue
Colias hyale	Pale clouded Yellow
Lycaena phlaeas	Small Copper
Maniola jurtina	Meadow Brown
Papilio machaon	Swallowtail
Pieris brassicae	Large White
Pieris napi	Green-veined White
Pieris rapae	Small White
Polygonia c-album	Comma
Polyommatus icarus	Common Blue
Pyronia tithonus	Hedge Brown
Thymelicus sylvestris	Small Skipper
Vanessa atalanta	Red Admiral
Vanessa cardui	Painted Lady

AMPHIBIANS	
Bufo bufo	Common Toad
Pelophylax esculenta	Edible Frog, Green Frog
Pelophylax lessonae	Pool Frog
Rana temporaria	Common Frog
Triturus alpestris	Alpine Newt
Triturus cristatus	Great Crested Newt
Triturus vulgaris	Smooth Newt

ODONATES	
Aeshna cyanea	Southern Hawker
Anax imperator	Emperor Dragonfly
Coenagrion puella	Azure Damselfly
Enallagma cyathigerum	Common Blue Damselfly
Ischnura elegans	Blue-tailed Damselfly
Lestes barbarus	Shy Emerald Damselfly
Lestes sponsa	Emerald Damselfly
Lestes viridis	Green Emerald Damselfly
Libellula depressa	Broad bodied Chaser
Pyrrhosoma nymphula	Large Red Damselfly
Sympecma fusca	Brown Emerald Damselfly
Sympetrum flaveolum	Yellow-winged Darter D.
Sympetrum sanguineum	Ruddy Darter D.

BIRDS	
Accipiter nisus	Sparrowhawk
Aegithalos caudatus	Long-tailed Tit
Anas platyrhynchos	Mallard
Anthus pratensis	Meadow Pipit
Buteo buteo	Buzzard
Certhia brachydactyla	Short Toed Treecreeper
Chloris chloris	Green Finch (*Carduelis chloris*)
Columba palumbus	Wood Pigeon
Corvus corone	Carrion Crow
Cuculus canorus	Cuckoo
Drendocopos major	Greater Spotted Woodpecker
Drendocopos minor	Lesser Spotted Woodpecker
Emberiza schoeniclus	Reed Bunting
Erithacus rubecula	Robin
Falco Tinnunculus	Kestrel
Fringilla coelebs	Chaffinch
Gallinulla chloropus	Moorhen
Garrulus glandarius	Jay
Luscinia megarhynchos	Nightingale
Motacilla flava	Yellow Wagtail
Parus caeruleus	Blue Tit
Parus major	Great Tit
Parus montanus	Willow Tit
Phasianus colchicus	Pheasant
Phylloscopus collybita	ChiffChaff
Phylloscopus trochilus	Willow Warbler
Pica pica	Magpie
Picus viridis	Green Woodpecker
Prunella modularis	Dunnock
Streptopelia turtur	Turtle Dove
Streptopelia decaocto	Collared Dove
Sturnus vulgaris	Starling
Sylvia atricapilla	Black Cap
Sylvia borin	Garden Warbler
Sylvia communis	Whitethroat
Troglodytes troglodytes	Wren
Turdus merula	Black Bird
Turdus philomelos	Song Thrush
Turdus viscivorus	Mistle Thrush
Vanellus vanellus	Lapwing

APPENDIX II: LIST OF SPECIES

PLANTS	
(groep) *Phleum pratense*	Timothy Grass
(groep) Rosa canina	Dog Rose
Acer campestre	Sorrel
Achillea millefolium	Yarrow
Achillea ptarmica	Sneezewort
Aegopodium podagraria	Ground Elder
Agrostis capillaris	Common Bent
Alisma plantago-aquatica	Common Water-Plantain
Alliaria petiolata	Garlic Mustard
Alnus glutinosa	Alder
Alopecurus aequalis	Shortawn Foxtail (US).
Alopecurus geniculatus	Marsh Fox-tail
Alopecurus pratensis	Meadow Fox-tail
Anemone nemorosa	Wood Anemone
Angelica sylvestris	Angelica
Anthoxanthum odoratum	Sweet Vernal-grass
Anthriscus sylvestris	Cow Parsley
Apera spica-venti	Loos Silky-bent, Wind Grass
Arrhenatherum elatius	False Oat-grass
Artemisia vulgaris	Mugwort
Baldellia ranunculoides ssp. repens	Lesser Water-Plantain
Bellis perennis	Daisy
Betula pendula	Silver Birch
Bidens frondosa	Devil's Beggartick (US)
Bidens tripartita	Trifid Burr-Marigold
Callitriche hamulata	Water Starwort (group)
Callitriche spec.	Water Starwort (group)
Caltha palustris	Marsh Marigold
Calystegia sepium	Hedge Bindweed
Capsella bursa-pastoris	Shepherds Purse
Cardamine flexuosa	Wavy Bittercress
Cardamine pratensis	Ladies Smock
Carex acuta	Slender Tufted Sedge
Carex acutiformis	Lesser Pond Sedge
Carex disticha	Brown Sedge
Carex hirta	Hairy Sedge
Carex ovalis	Oval Sedge
Carex vesicaria	Bladder Sedge
Carpinus betulus	Hornbeam
Castanea sativa	Sweet Chestnut
Centaurea thuillieri	Meadow Knapweed
Cerastium fontanum	Common Mouse-Ear
Chaerophyllum temulum	Rough Chervil
Chelidonium majus	Greater Celandine
Cirsium arvense	Creeping Thistle
Cirsium palustre	Marsh Thistle
Cirsium vulgare	Spear Thistle
Convolvulus arvensis	Common Bind Weed
Conyza canadensis	Canadian Fleabane
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Cynosurus cristatus	Crested Dog's-tail
Cytisus scoparius	Broom

PLANTS	
Dactylis glomerata	Cocksfoot
Daucus carota	Wild Carrot
Dryopteris carthusiana	Narrow Buckler Fern
Dryopteris filix-mas	Male Fern
Eleocharis palustris s.s.	Common Spike-rush
Elymus repens	Couch Grass
Epilbium angustifolium	Rosebay Willowherb
Epilobium hirsutum	Great Willowherb
Epilobium tetragonum	Square-Stalked Willowherb
Epipactis helleborine	Broad-Leaved helliborine
Equisetum arvense	Common Horsetail
Equisetum fluviatile	Water Horsetail
Erophila verna	Common Whitlow Grass
Eupatorium cannabinum	Hemp-Agrimony
Festuca pratensis	Meadow Fescue
Filipendula ulmaria	Meadowsweet
Frangula alnus	Alder Buckthorn
Fraxinus excelsior	Ash
Galeopsis tetrahit	Common Hemp-Nettle
Galium aparine	Cleavers or Goose Grass
Galium mollugo	Hedge Bedstraw
Galium palustre	Marsh Bedstraw
Geranium robertianum	Herb Robert
Glechoma hederacea	Ground Ivy
Glyceria fluitans	Floating Sweet-grass
Gnaphalium uliginosum	Marsh Cudweed
Hedera helix	Ivy
Heracleum sphondylium	Hogweed
Hieracium pilosella	Mouse-ear Hawkweed
Hieracium sabaudum	New England Hawkweed
Hieracium umbellatum	Leafy Hawkweed
Holcus lanatus	Yorkshire Fog
Hottonia palustris	Water Violet
Hydrocharis morsus-ranae	Frogbit
Hydrocotyle vulgaris	Pennywort
Hypericum elodes	Marsh St. Johns-wort
Hypericum perforatum	Perforate St. Johns-wort
Hypochaeris radicata	Common Cats-Ear
Ilex aquifolium	Holly
Iris pseudacorus	Yellow Iris
Juncus acutiflorus	Sharp-flowered Rush
Juncus articulatus	Jointed Rush
Juncus bufonius s.s.	Toad Rush
Juncus conglomeratus	Compact Rush
Juncus effusus	Soft Rush
Juncus tenuis	Wiry, Path or Poverty Rush (US)
Lactuca serriola	Prickly Lettuce
Lamium album	White Dead-nettle
Lamium galeobdolon	Yellow Archangel
Lamium purpureum	Red Dead-nettle
Lapsana communis	Nipplewort
Lemna minuta	Least Dickweed
Leontodon autumnalis	Autumn Hawkbit

APPENDIX II: LIST OF SPECIES

PLANTS	
Leucanthemum vulgare	Oxeye Daisy
Linaria vulgaris	Common Toadflax
Lolium perenne	Perennial Rye-grass
Lonicera periclymenum	Honeysuckle, Woodbine
Lotus pedunculatus	Greater Birds-foot-trefoil
Ludwigia grandiflora	Largeflower primrose willow (US)
Luzula multiflora	Heath Woodrush
Lychnis flos-cuculi	Ragged Robin
Lycopus europaeus	Wolfs Bane
Lysimachia vulgaris	Yellow Loosestrife
Lythrum portula	Water-purslane
Lythrum salicaria	Purple-loosestrife
Matricaria recutita	Scented Mayweed
Medicago lupulina	Black medic
Mentha aquatica	Watermint
Myosotis arvensis	Field Forget-me-not
Myosotis cespitosa	Tufted Forget-me-not
Papaver dubium	Long-headed Poppy
Phalaris arundinacea	Common Reed Grass
Phragmites australis	Common Reed
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Poa annua	Annual Meadow-grass
Poa trivialis	Rough Meadow-grass
Polygonum amphibium	Amphibious Bistort
Polygonum aviculare	Knotgrass
Polygonum hydropiper	Waterpepper
Polygonum lapathifolium	Pale Persicaria
Polygonum persicaria	Red-shank
Populus canadensis	Canadian Poplar
Populus canescens	Grey Poplar
Populus tremula	Aspen
Potamogeton natans	Broad-Leaved Pond Weed
Potentilla anserina	Silver weed
Potentilla erecta	Tormentil
Primula elatior	Cowslip
Prunella vulgaris	Self-Heal
Prunus avium	Bird Cherry
Prunus serotina	Rum Cherry
Prunus spinosa	Blackthorn
Pteridium aquilinum	Bracken
Pulicaria dysenterica	Common Fleabane
Quercus robur	Sessile Oak
Quercus rubra	Red Oak
Ranunclus spec.	Buttercup Spec.
Ranunculus acris	Meadow Buttercup
Ranunculus ficaria	Lesser Celandine
Ranunculus flammula	Lesser Spearwort
Ranunculus repens	Creeping Buttercup

PLANTS	
Ranunculus sceleratus	Celery-Leaved Buttercup
Ribes rubrum	Red Currant
Robinia pseudoacacia	False Acacia
Rorippa amphibia	Great Yellow-cress
Rorippa palustris	Marsh Yellow-cress
Rubus spec.	Bramble spec.
Rumex acetosa	Common Sorrel
Rumex acetosella	Sheep's Sorrel
Rumex crispus	Curled Dock
Rumex obtusifolius	Broad-leaved Dock
Sagina apetala	Annual Pearlwort
Sagittaria sagittifolia	Arrowhead
Salix alba	White Willow
Salix x multinervis	Willow and Salow
Sambucus nigra	Elder
Saxifraga tridactylites	Rue-leaved Saxifrage
Scirpus lacustris	Common Clubrush
Scrophularia nodosa	Common Figwort
Senecio jacobaea	Common Ragwort
Silene dioica	Red Campion
Solanum dulcamara	Bittersweet
Sonchus asper	Prickly Sow-Thistle
Sorbus aucuparia	Mountain Ash
Sparganium emersum	Unbranched Burr-reed
Sparganium erectum	Branched Burr-Reed
Spergula arvensis	Corn Spurrey
Stachys sylvatica	Hedge Woundwort
Stellaria alsine	Bog Stitchwort
Stellaria graminea	Lesser Stitchwort
Stellaria holostea	Greater Stitchwort
Stellaria media	Common Chickweed
Symphytum officinale	Common Comfrey
Tanacetum vulgare	Tansy
Taraxacum, spec.	Dandelion spec.
Trifolium pratense	Red Clover
Trifolium repens	White Clover
Tussilago farfara	Colt's-Foot
Typha latifolia	Bulrush
Urtica dioica	Stinging Nettle
Utricularia australis	Bladderwort (*U. neglecta*)
Valeriana repens	Valerian (*V. officinalis*)
Veronica arvensis	Wall Speedwell
Viburnum opulus	Guelder Rose
Vicia cracca	Tufted Vetch
Vicia hirsuta	Hairy Tare
Vicia sativa ssp. sativa	Common Vetch
Vicia sepium	Bush Vetch
Vicia tetrasperma	Smooth tare
Viola tricolor	Wild Pansy

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