Management of widespread plant species

Action C3 - Status 2023

The RIPARIAS project has received funding from the LIFE Programme of the European Union

RIPARIAS

Reaching Integrated and Prompt Action in Response to Invasive Alien Species

Contents

Contents 2
1. Introduction 2
2.1 Riparian plants 3
2.1.1 Impatiens glandulifera 3
2.1.1.1 Brussels-Capital Region 4
2.1.1.2 Flanders 4
2.1.1.3 Wallonia 7
2.1.2 Heracleum mantegazzianum 9
2.2 Aquatic plants 13
2.2.1 General management trends 13
2.2.2 Hydrocotyle ranunculoides 15
2.2.2.1 Examples of managed sites 17
2.2.3 Myriophyllum aquaticum 24
2.2.3.1 Examples of managed sites 25
2.2.4 Ludwigia grandiflora 28
3. Annex 1 – Details of sites first managed prior to 2023 31
4. Annex 2 – Overview of *Heracleum mantegazzianum* management in Wallonia (Dyle-Senne basin), with indication of plant abundance 42

1. Introduction

This report describes the management actions executed in 2023 as part of Action C3 within the Life RIPARIAS project. Action C3 involves the management of (relatively) widespread aquatic and riparian invasive alien plant species. According to their distribution in the Life RIPARIAS project area, the following plant species are considered to be widespread:

Riparian plants:

- *Impatiens glandulifera* (Himalayan balsam)
- *Heracleum mantegazzianum* (Giant hogweed)

Aquatic (amphibious) plants:

- *Hydrocotyle ranunculoides* (Floating pennywort)
- *Myriophyllum aquaticum* (Parrot's-feather)
- *Ludwigia grandiflora* (Water primrose)

For these species, complete eradication within the project area is considered unrealistic. Therefore, the management aims at containment or local eradication. Priority areas for management of the widespread invasive species are included in the River Basin Management Strategy, which is based on the decision support tool developed during the early stages of Life RIPARIAS.

2. Overview of management actions

2.1 Riparian plants

2.1.1 Impatiens glandulifera

All terrain partners in the three regions (Brussels-Capital Region, Wallonia and Flanders) started managing *I. glandulifera* in 2023 or continued pre-existing management efforts, in accordance with the river basin management strategy. Figure 1 provides an overview of streams managed in 2023 under Life RIPARIAS. Other populations that have been managed in or prior to 2023 are not depicted.

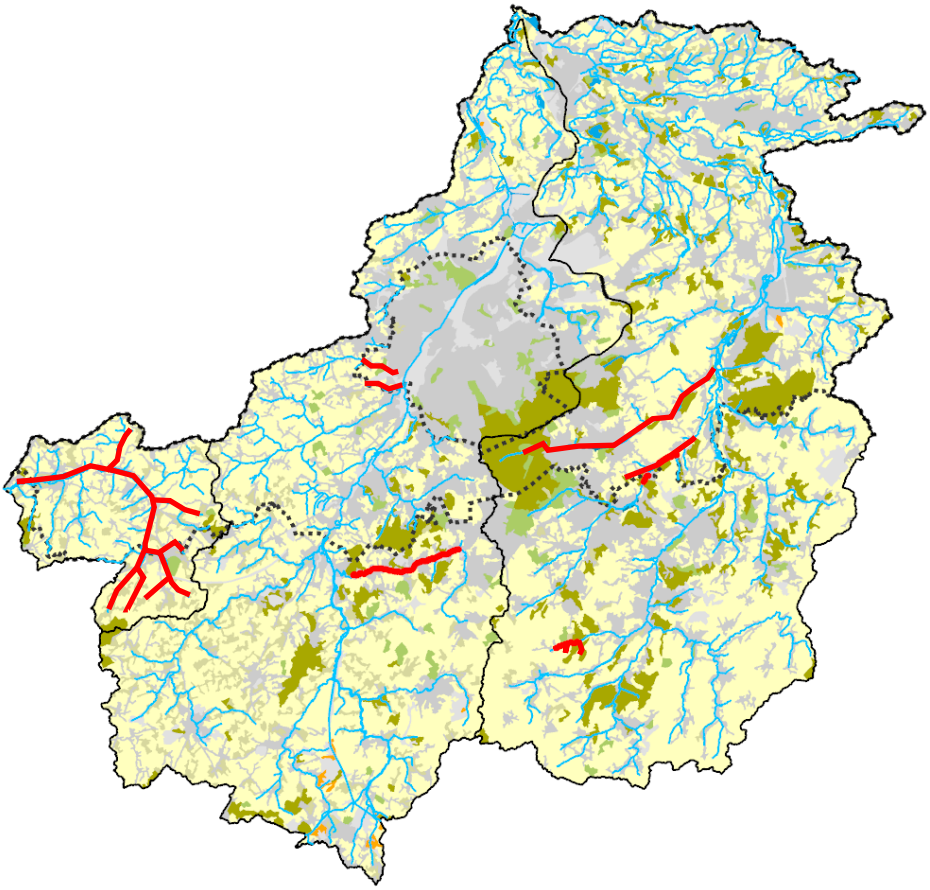

Figure 1: Overview of management of Impatiens glandulifera *along streams in the project area (red lines). Only management under Life RIPARIAS is shown.*

2.1.1.1 Brussels-Capital Region

In the Brussels-Capital Region, *I. glandulifera* has been managed along the Vogelzangbeek and the Neerpedebeek, two streams situated in the south-eastern part of the region (see Figure 1). Along Vogelzangbeek, which borders the Flemish Region, several smaller populations were removed in August 2023, but densities were low compared to 2022. Along Neerpedebeek, three management rounds (July, August and September 2023) were executed over a section of around 2 km.

2.1.1.2 Flanders

In 2023, *I. glandulifera* was managed in the Mark basin (RSU 53) and in the catchment areas of the IJse and Laan, two tributaries of the Dijle river (Dijle basin, RSU 11). The management was financed by the Province of Vlaams-Brabant and VMM, and executed through manual removal (pulling out) by external contractors.

Along the Mark, *I. glandulifera* growing on and near the river banks has been managed for several years by VMM, resulting in a decline close to the main river. In order to extend the

management to source populations, upstream tributaries of the Mark were managed in the summer of 2023. Especially the Rifrafbeek, Arebeek and Hollebeek were heavily infested. The tributaries were managed twice, while the main course of the Mark was managed once.

Eradication of populations within the forested floodplain of the Mark will be a challenge in the coming years.

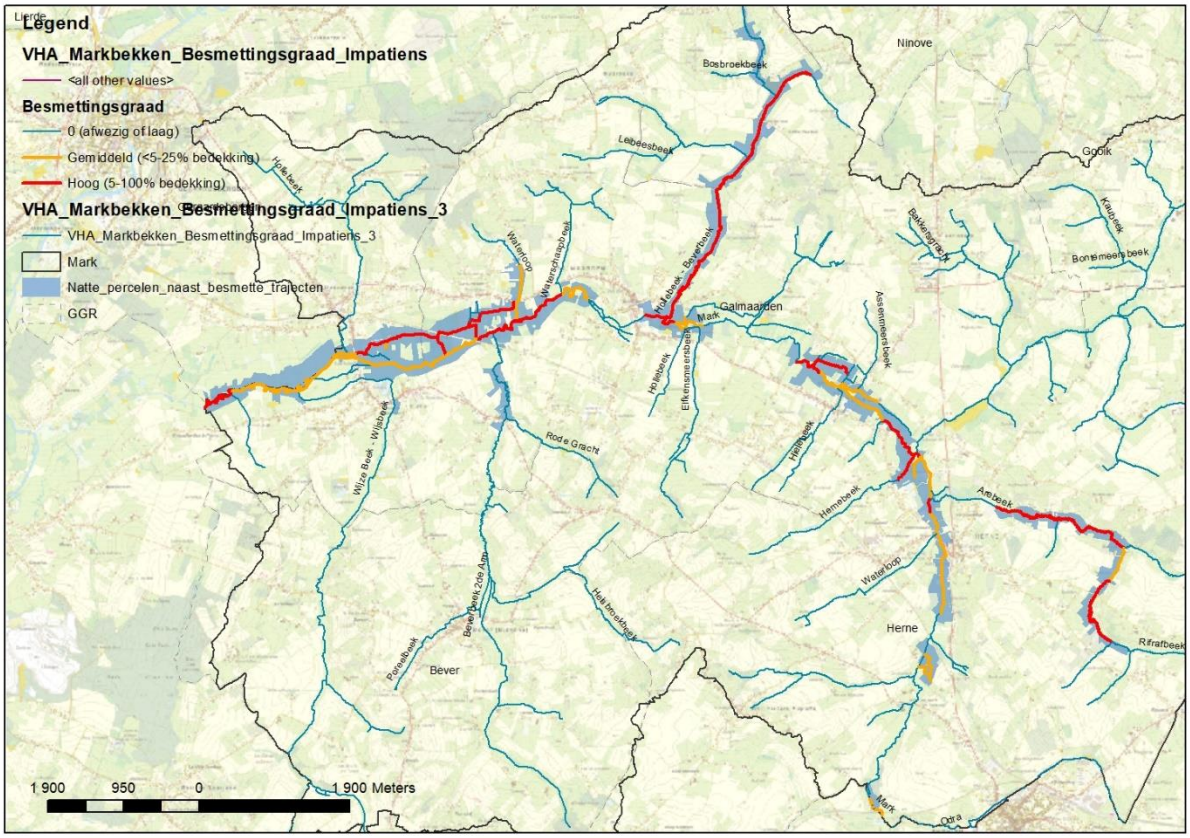

Figure 2: Distribution and abundance of managed Impatiens glandulifera *along streams in the Flemish part of the Mark basin. Red: medium to high abundance (5-100% cover), orange: low to medium abundance (<5-25% cover).*

Along the IJse and the Laan, *I. glandulifera* mainly occurs on the river banks and in the floodplain. Smaller tributaries appear less affected (Figure 3). In 2023, the species was managed for the first time within the area.

The IJse was managed twice. Due to extreme rain fall, management along the Laan proved to be highly challenging and was abandoned halfway through. As opposed to the IJse, the river banks along the Laan are difficult to reach because of the densely forested, highly natural environment (Figure 4). As of 2024, management will likely extend into the floodplain area to suppress source populations within the valley.

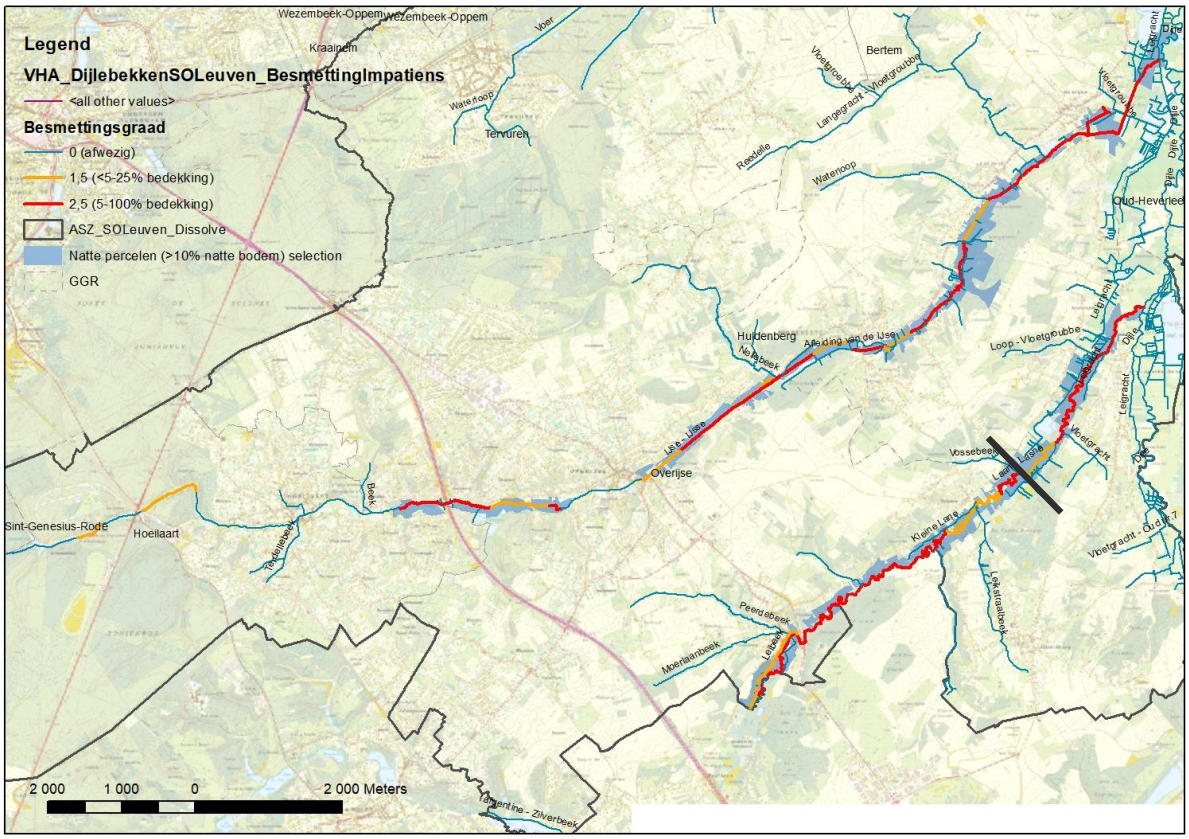

Figure 3: Distribution and abundance of managed Impatiens glandulifera *along the IJse and Laan in Flanders. Red: medium to high abundance (5-100% cover), orange: low to medium abundance (<5-25% cover). Along the Laan, the management team reached the black stripe.*

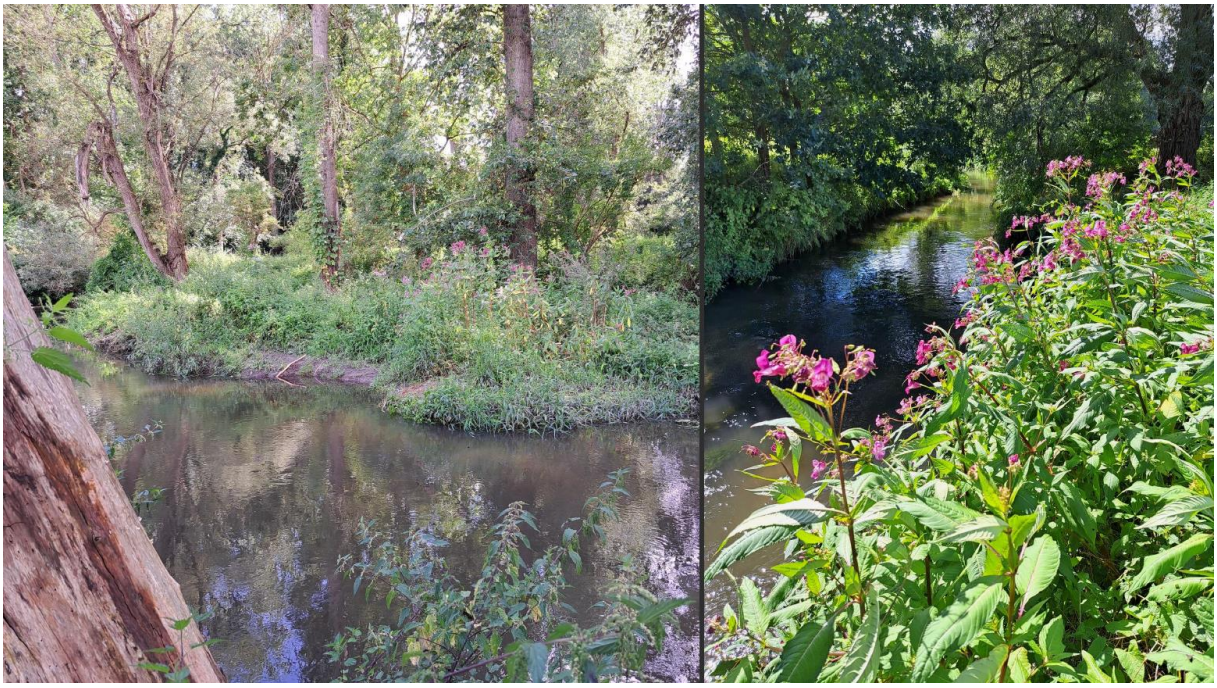

Figure 4: Impatiens glandulifera *growing along the Laan, Flanders.*

Figure 5: Uprooted Impatiens glandulifera *(middle) and biomass stored in a big bag in attendance of safe disposal (right).*

2.1.1.3 Wallonia

The Life RIPARIAS team of CR Senne and CR Dyle-Gette managed several stream segments in the Walloon part of the Dijle and Senne basins (Figure 6). Plants were removed manually as well as with brushcutters, depending on the local situation. Most sites were visited multiple times to remove regrowth.

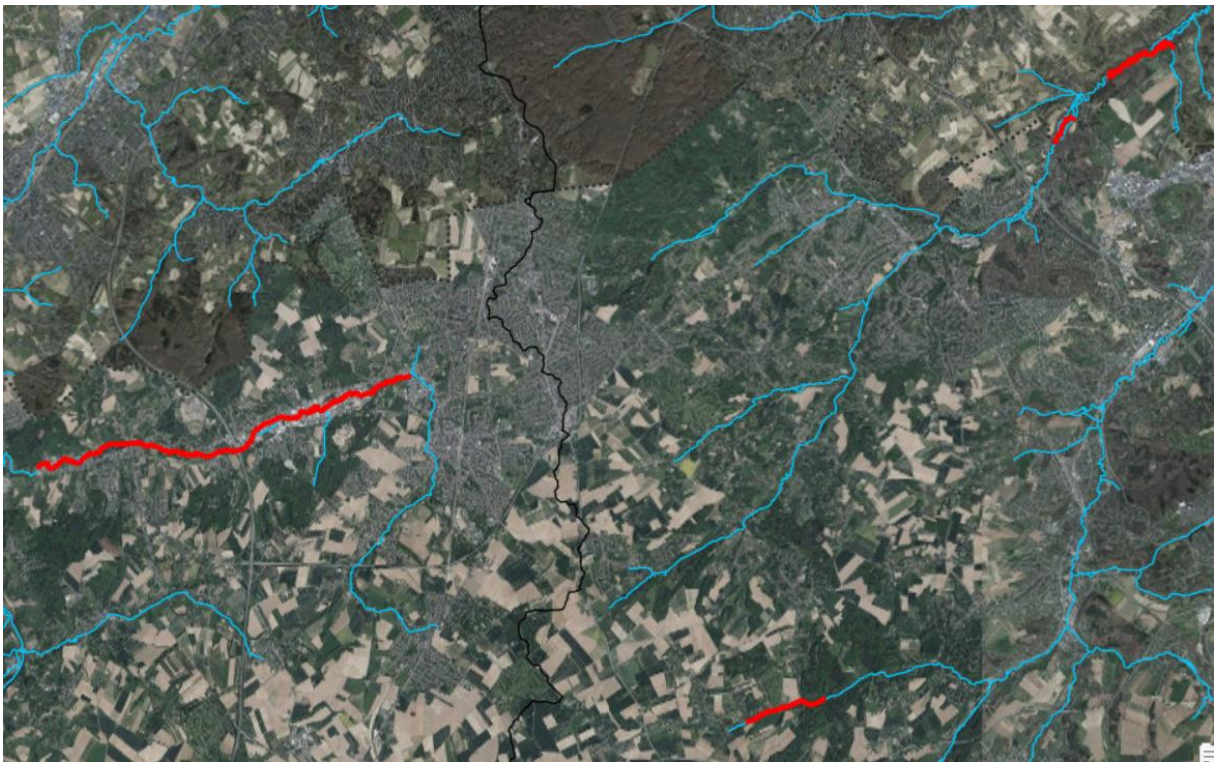

Figure 6: Repeated management (red lines) of Impatiens glandulifera *in the Walloon part of the Dijle and Senne river basins. Only the management by the Life RIPARIAS team is shown. The map only shows second and third visits.*

In the upstream catchment of the Mark basin (RSU 52), CR Dendre checked a stream length of 30 km in 2023 and removed four populations of *I. glandulifera* (Figure 7). The largest populations (3 and 4 on the map) occurred in the stream floodplain in an alluvial forest.

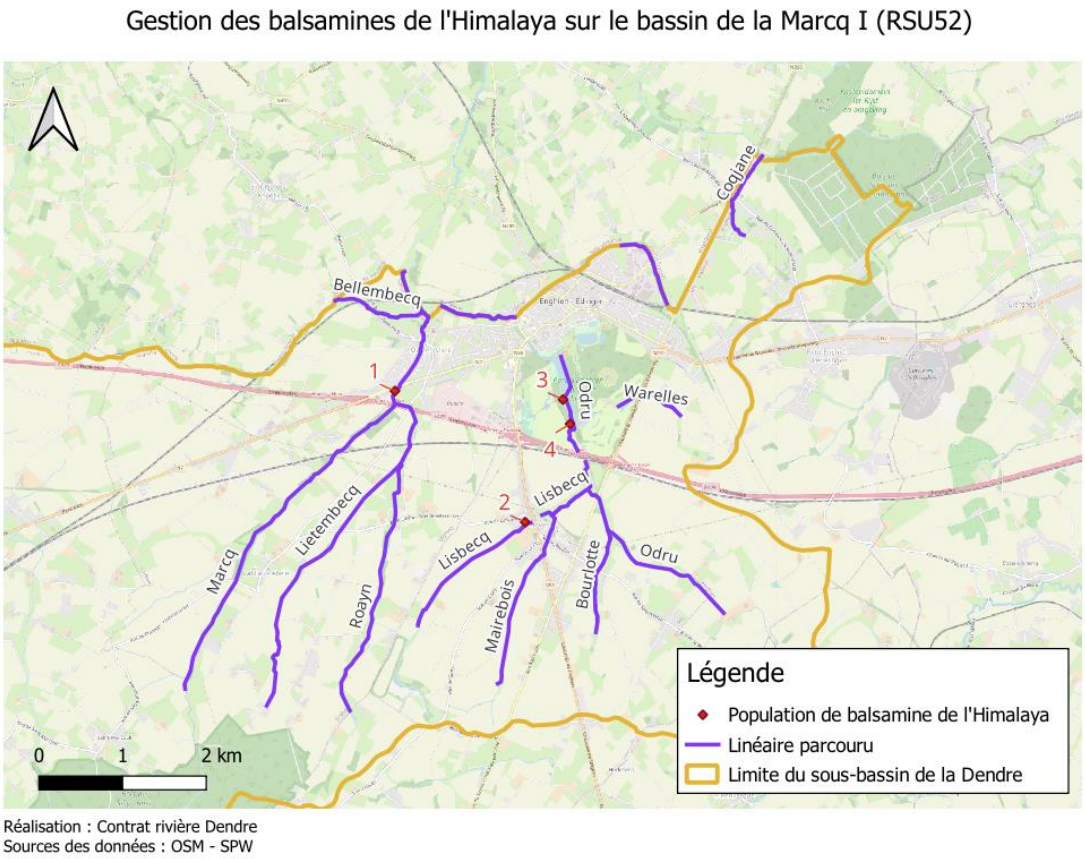

Figure 7: Surveillance (purple lines) and management (red dots) of Impatiens glandulifera *in RSU 52 (Mark basin) by CR Dendre.*

2.1.2 Heracleum mantegazzianum

Figure 8 provides an overview of populations of *Heracleum mantegazzianum* managed in 2023 under Life RIPARIAS in the Brussels-Capital and Flemish Region. Other populations that have been managed in or prior to 2023 are not depicted.

In the Brussels-Capital Region, four populations were managed in 2023 using a spade to cut the roots to remove all plants. A total of about 40 individual small plants were removed in these locations by the field managers of BE.

In Flanders, an external contractor removed around 280 plants clustered in several patches along the IJse and Mark streams (Figure 9; Figure 10; Figure 11). In Wallonia, *H. mantegazzianum* is actively managed, but not by the LIFE RIPARIAS teams. Therefore, part of the Walloon data on this species are only included in Annex 2.

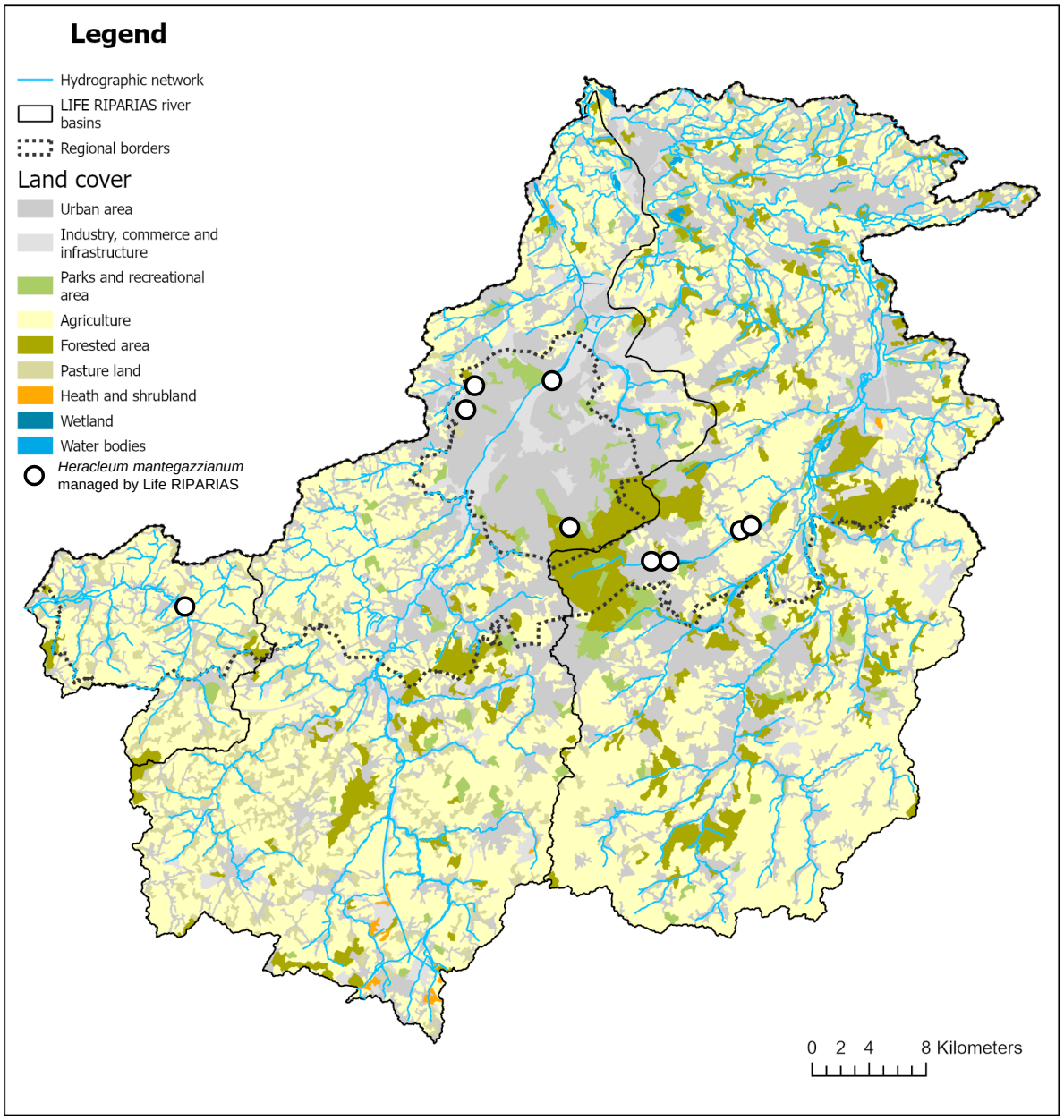

Figure 8: Overview of management of Heracleum mantegazzianum *along streams in the project area (white dots). Only management under Life RIPARIAS in 2023 is shown. In Wallonia, the species is also managed but not by the LIFE RIPARIAS teams.*

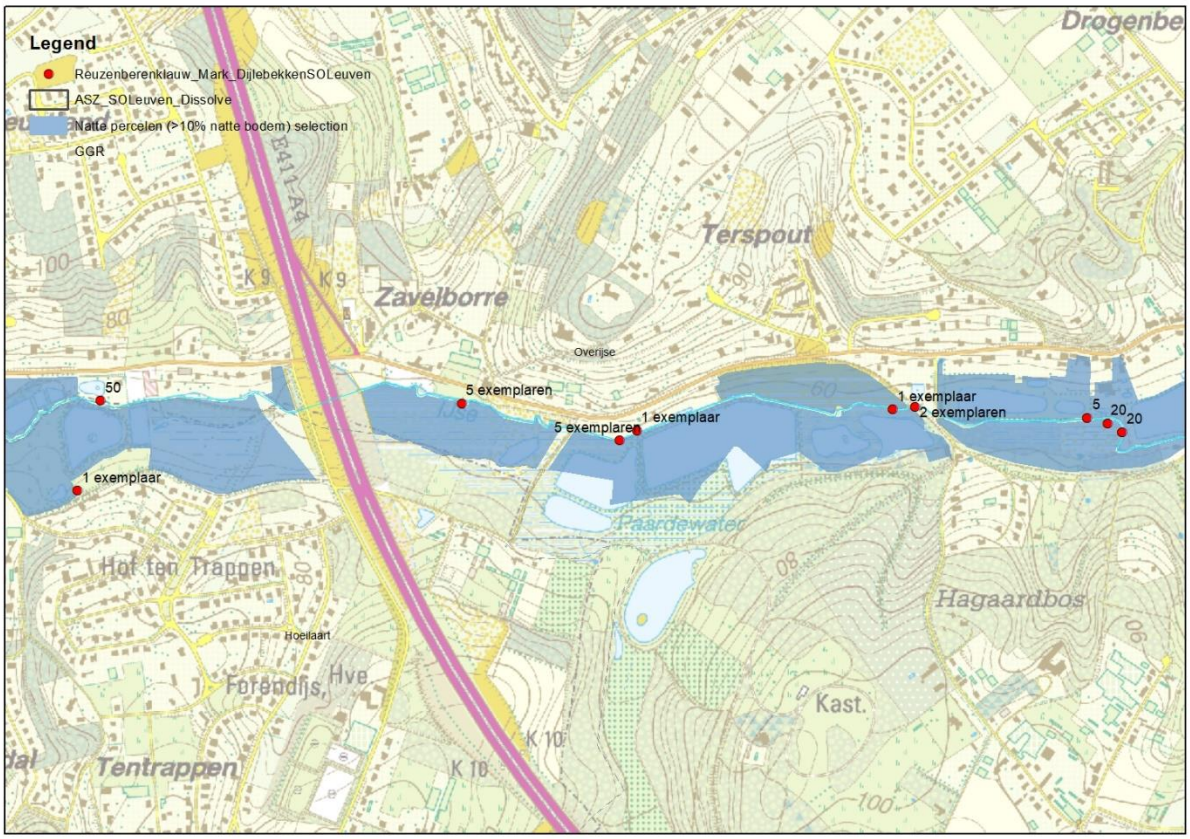

Figure 9: Heracleum mantegazzianum *clusters along the upstream IJse, Flanders. The approximate number of plants is indicated.*

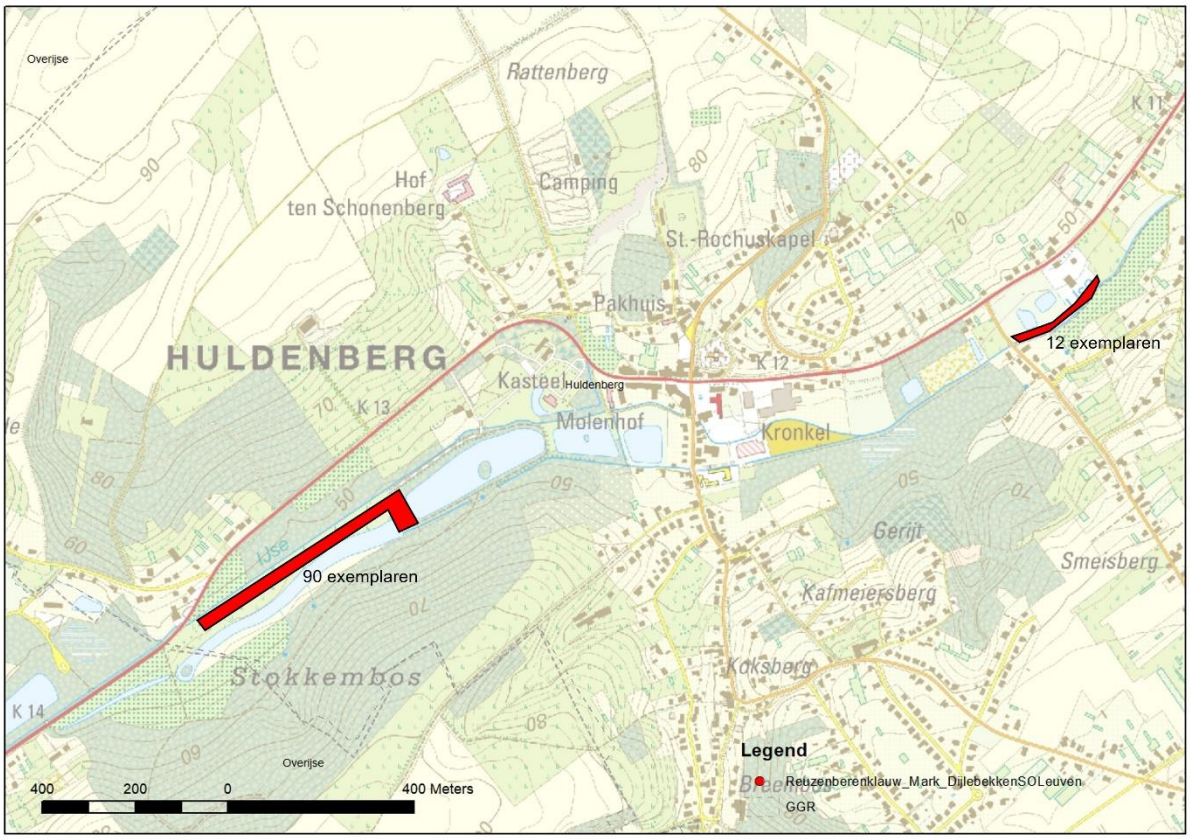

Figure 10: Heracleum mantegazzianum *clusters along the middle reach of the IJse, Flanders. The approximate number of plants is indicated.*

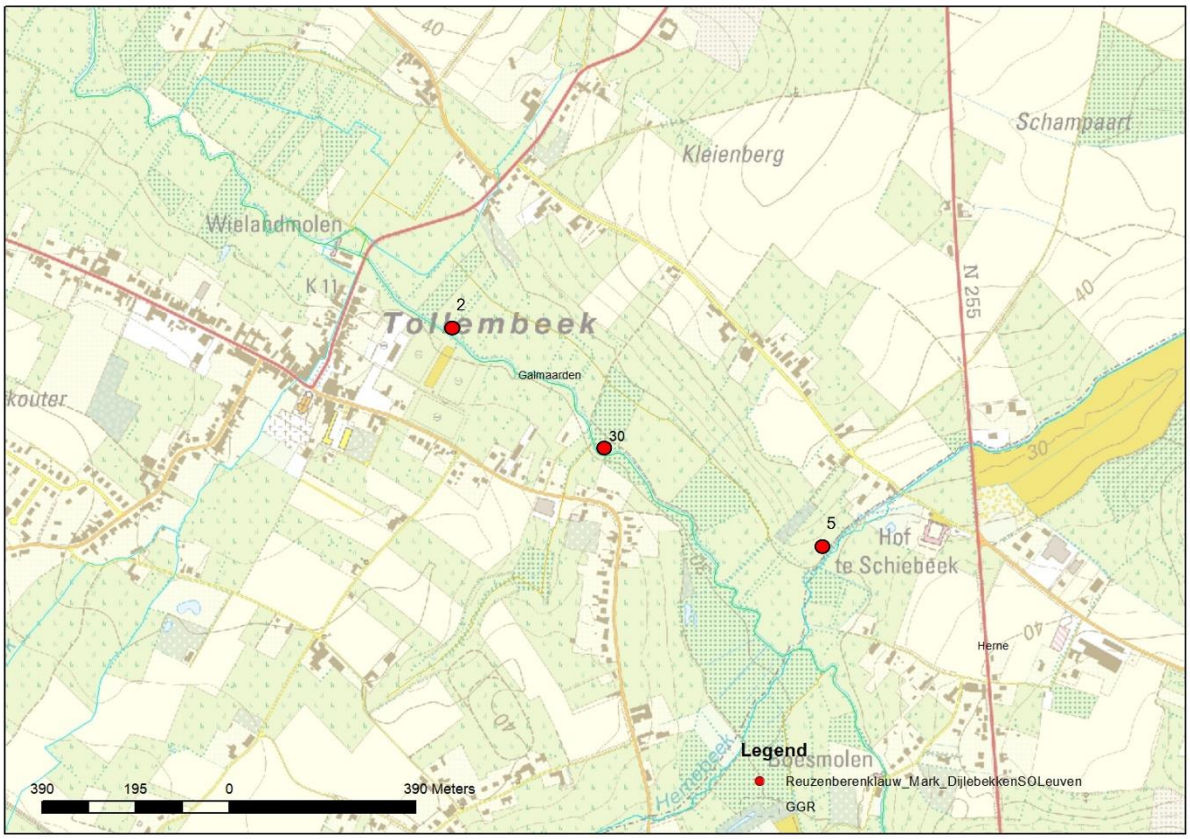

Figure 11: Heracleum mantegazzianum *clusters along the Mark, Flanders. The approximate number of plants is indicated.*

2.2 Aquatic plants

Three aquatic plant species are considered widespread in the project area: *Hydrocotyle ranunculoides*, *Myriophyllum aquaticum* and *Ludwigia grandiflora*. Although these species have comparable growth forms – often colonizing water bodies from the littoral zone into the open water – they vary in morphology, biomass allocation and habitat preference. This means removal requires species-specific management, although manual removal appears to be the dominant method used in 2023 for all species.

2.2.1 General management trends

The availability of the management registration tool (action A2 of Life RIPARIAS) allowed to extract some general patterns in the management of the three aquatic plant species. Most data are based on input from Wallonia, the region containing the majority of the populations that were managed in 2023.

Figure 12 shows the evolution of plant volume removed per species in the course of 2023. Management started earlier for *H. ranunculoides* and *M. aquaticum*. Most sites were visited multiple times. Some sites contained high volumes of invasive aquatic plant species.

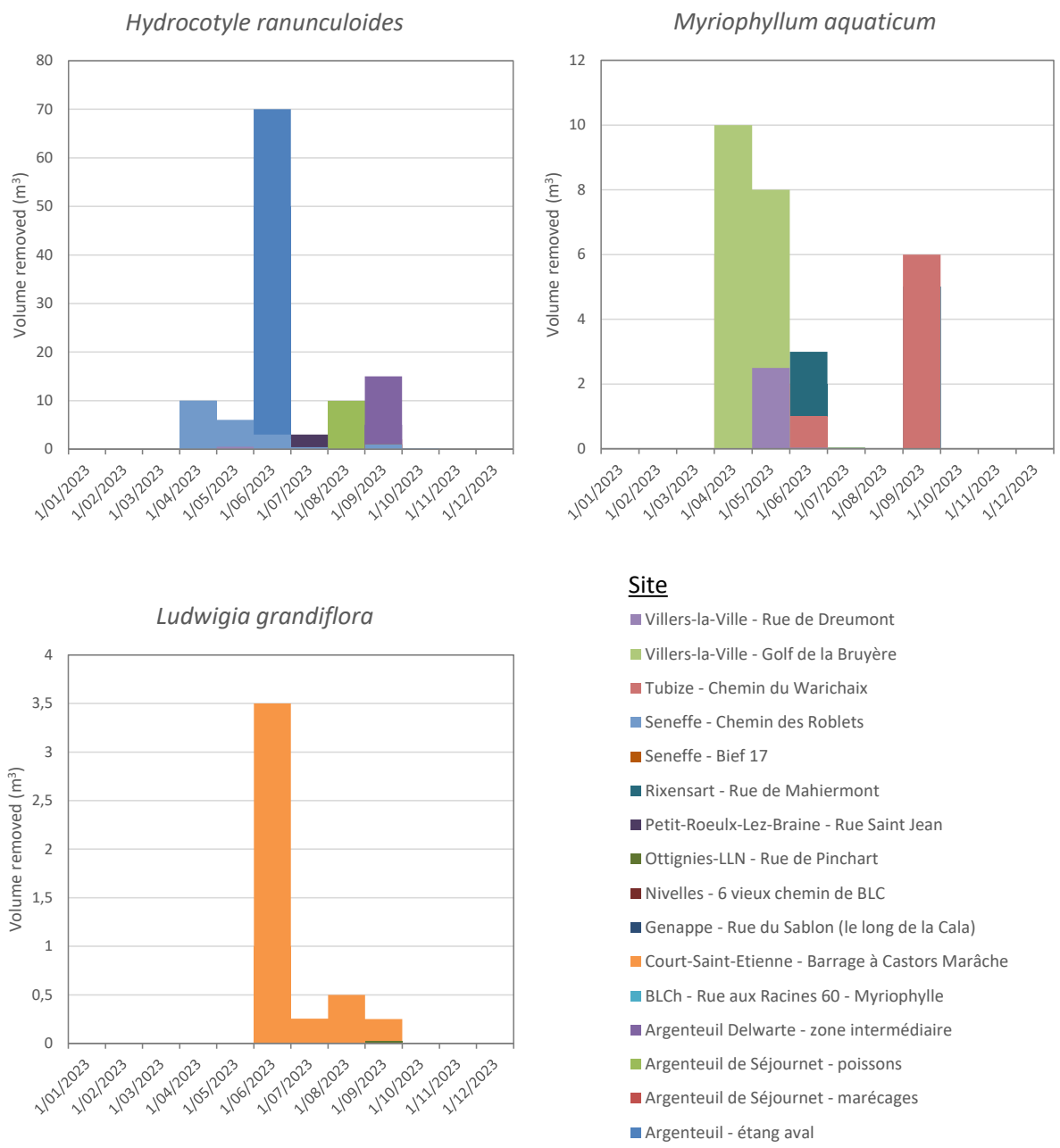

Figure 12: Plant volume removed per species during 2023 in Wallonia (Dijle and Senne river basins).

Compared to the removal of *L. grandiflora*, management of *H. ranunculoides* and *M. aquaticum* appears to be more cost-efficient (Figure 13). Based on the current data, 0.23 m^3 and 0.16 m^3 of plant volume can be processed per hour and per person for *H. ranunculoides* and *M. aquaticum*, respectively, compared to an average of only 0.03 for *L. grandiflora*. The results are in line with the perception of many field managers that removal of *Ludwigia* spp. is highly challenging compared to *H. ranunculoides* and *M. aquaticum*.

It should be noted that the data set is limited and factors like removal method, site characteristics, accessibility or habitat type were not taken into account.

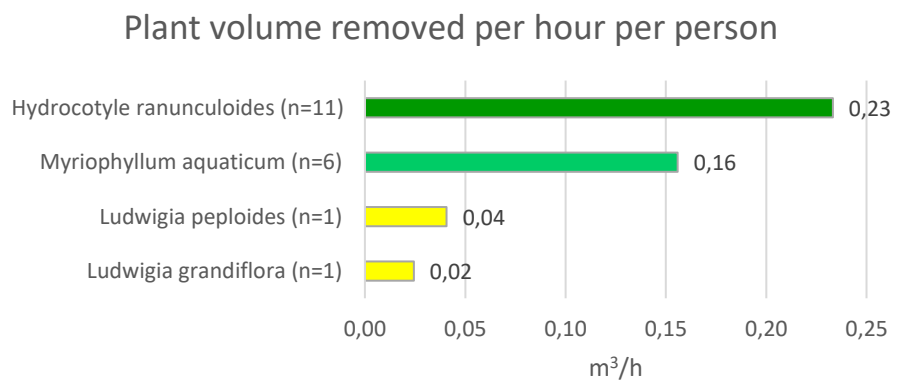

Figure 13: Plant volume removed per hour per person for three invasive aquatic plant species.

A few general species-specific properties can be deduced after the first year of management:

Ludwigia disappears completely in winter and starts developing in June while *Hydrocotyle* is present year round and is already very developed in April. This is the main reason why extracted volumes differ greatly. *Ludwigia* is much more difficult to manage because it thrives in semi-aquatic environments, develops a very dens net of roots and so does not compost well when extracted as the species stays alive in dry area.

While *Hydrocotyle* mainly forms mats on the water surface, sometimes some stems enter the banks but it is relatively easy to drag the mat when the species is present on open water. When *Hydrocotyle* is growing in muddy/wetland conditions, or mixes with vegetation such as reeds, it is very difficult to extract, since the plant is mixed with the other plants or the small roots are attached to the mud and easily fragment.

For *Myriophyllum*, it is never only a mat on open water such as *Hydrocotyle* since each stem is rooted in the sediment. So the challenge is to pull all the roots out. Again, management is difficult in muddy, very shallow water conditions where the plants break and leave fragments in the mud that will regrow.

2.2.2 Hydrocotyle ranunculoides

In 2023, a total of 12 populations of *H. ranunculoides* were managed in the project area (Figure 14). The majority of the populations was situated in Wallonia; therefore most of the control actions occurred in Wallonia. The plant was not detected in the Brussels-Capital Region. Most sites were isolated or flow-through ponds. In Flanders, a riverine population was managed in the IJse stream, in order to prevent further spread to downstream areas. The source population grows in a nearby private pond that might be managed in 2024.

Manual removal was the predominant management technique for this species.

Annex 1 contains a more detailed description of some of the populations where management was initiated prior to 2023.

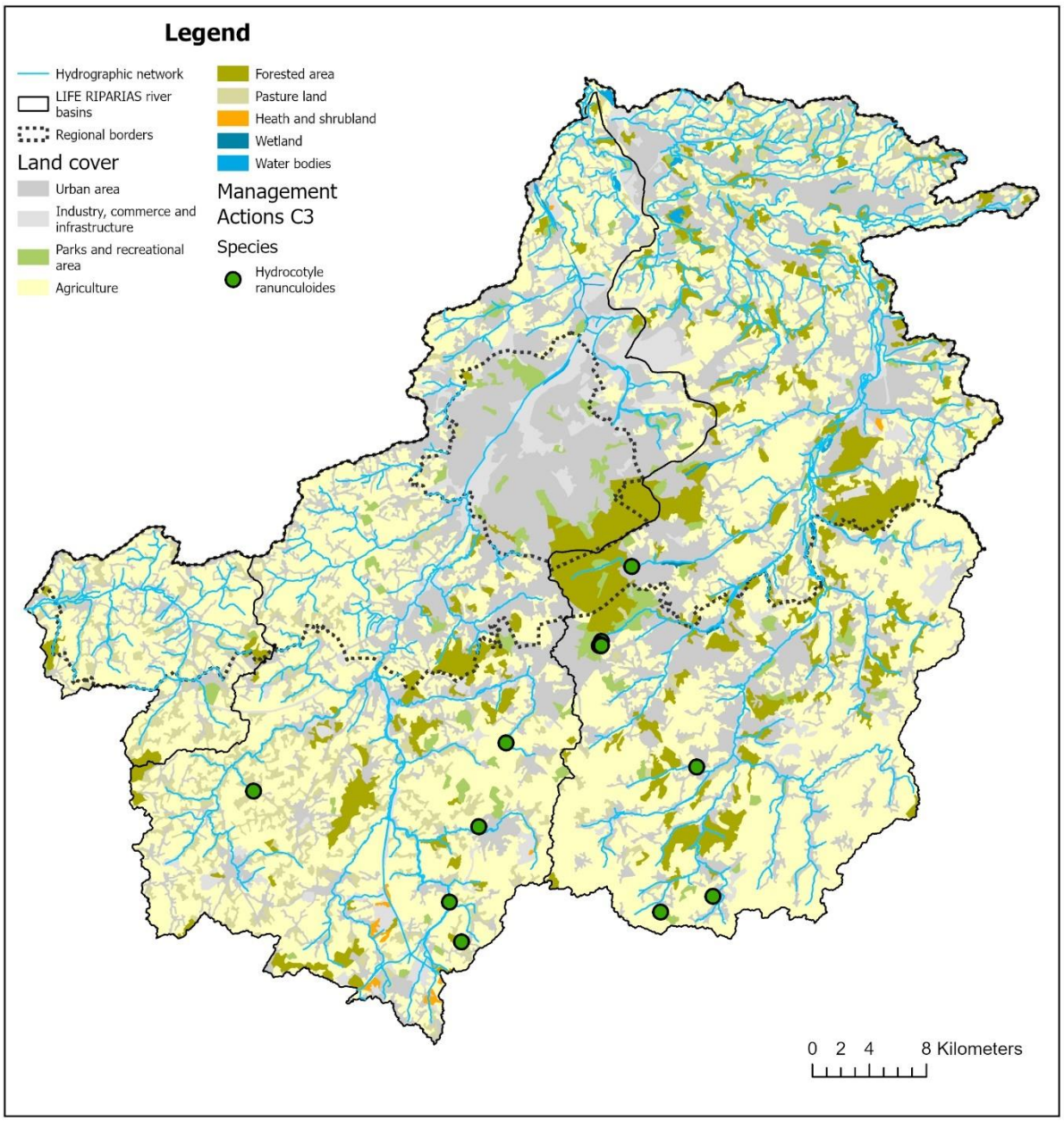

Figure 14: Overview of management of Hydrocotyle ranunculoides *in the project area (dark green dots).*

2.2.2.1 Examples of managed sites

IJse, Hoeilaart (Flanders)

Argenteuil (Wallonia)

Villers-la-Ville (Wallonia)

2.2.3 Myriophyllum aquaticum

Eight populations of *M. aquaticum* were managed in 2023, seven in Wallonia and one in the Brussels-Capital Region (Figure 15).

For Brussels, management occurred on publicly accessible private property, and an external contractor was appointed by the site manager with a follow-up by BE, including regular visits prior, during and after the management effort.

Annex 1 contains a more detailed description of some of the populations where management was initiated prior to 2023.

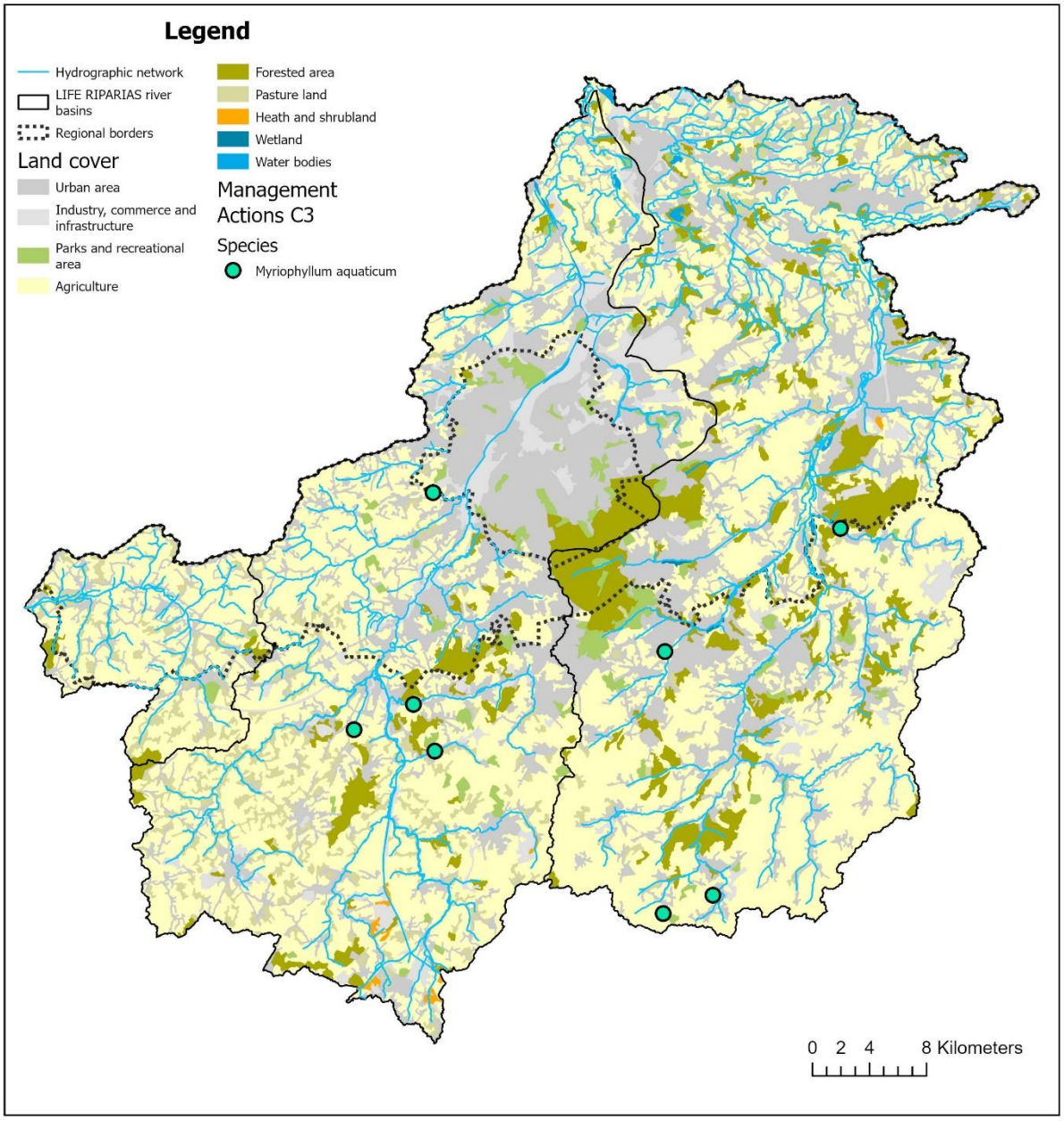

Figure 15: Overview of management of Myriophyllum aquaticum *in the project area (light green dots).*

2.2.3.1 Examples of managed sites

Tubize (Wallonia)

Villers-la-Ville (Wallonia)

Anderlecht (Brussels-Capital Region)

2.2.4 Ludwigia grandiflora

Three populations of *L. grandiflora* have been managed in 2023, all in Wallonia (Figure 16).

Annex 1 contains a more detailed description of some of the populations where management was initiated prior to 2023.

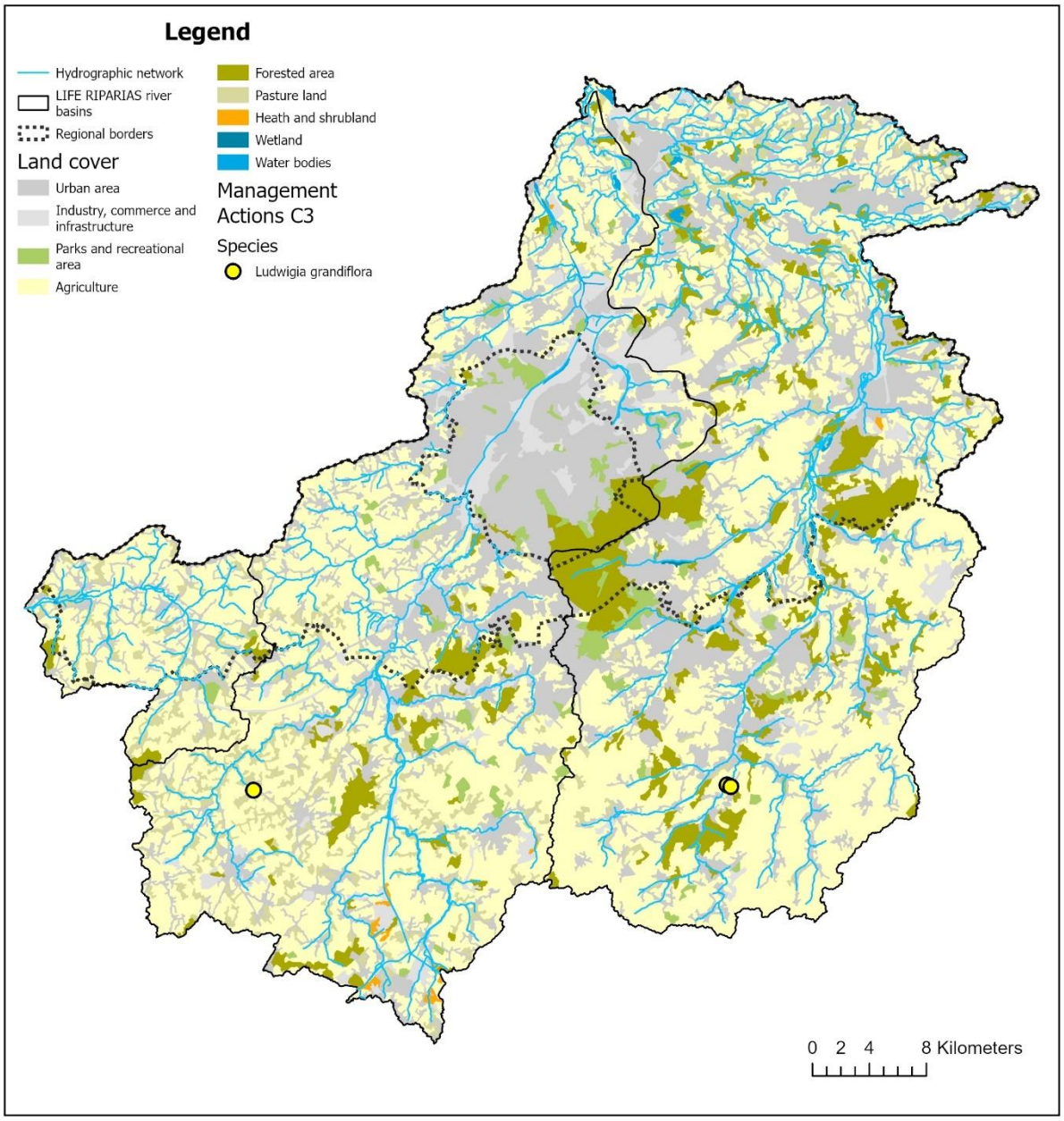

Figure 16: Overview of management of Ludwigia grandiflora *in the project area (yellow dots).*

Table 1: Overview of managed populations in 2023.

Code	Species	Site	Municipality	Region	Organisation	Habitat	Eradication method
Hm1	*Heracleum mantegazzianum*	Ganshoren - cemetery parking (riverside Molenbeek)	Ganshoren	BCR	BE	River bank	Manual removal
Hm2	*Heracleum mantegazzianum*	Berchem - Zavelenberg	Sint-Agatha-Berchem	BCR	BE	Wetland	Manual removal
Hm3	*Heracleum mantegazzianum*	Boitsfort - "Drowned children" and "clos des chênes"	Boisfort	BCR	BE		Manual removal
Hm4	*Heracleum mantegazzianum*	Evere - Walckiers	Evere	BCR	BE		Manual removal
Hm5	*Heracleum mantegazzianum*	IJse catchment	Hoeilaart/Overijse/Huldenberg	Flanders	VMM	River bank and floodplain	Manual removal
Hm6	*Heracleum mantegazzianum*	Mark basin	Galmaarden	Flanders	VMM	River bank and floodplain	Manual removal
Hm7	*Heracleum mantegazzianum*	Toevoerkanaal wachtbekkens Trawool	Machelen	Flanders	VMM	River bank	Manual removal
Hr1	*Hydrocotyle ranunculoides*	Hoeilaart - IJse	Hoeilaart	Flanders	VMM, province Vlaams-Brabant	Stream	Manual removal
Hr2	*Hydrocotyle ranunculoides*	Argenteuil - étang aval	Argenteuil	Wallonia	CR Senne/Dyle-Gette	Pond	Manual removal
Hr3	*Hydrocotyle ranunculoides*	Argenteuil de Séjournet - marécages	Argenteuil	Wallonia	CR Senne/Dyle-Gette	Pond	Manual removal
Hr4	*Hydrocotyle ranunculoides*	Argenteuil de Séjournet - poissons	Argenteuil	Wallonia	CR Senne/Dyle-Gette	Pond	Manual removal
Hr5	*Hydrocotyle ranunculoides*	Argenteuil Delwarte - zone intermédiaire	Argenteuil	Wallonia	CR Senne/Dyle-Gette	Pond	Manual removal
Hr6	*Hydrocotyle ranunculoides*	Genappe - Rue du Sablon (le long de la Cala)	Genappe	Wallonia	CR Senne/Dyle-Gette	Pond	Manual removal
Hr7	*Hydrocotyle ranunculoides*	Nivelles - 6 vieux chemin de BLC	Nivelles	Wallonia	CR Senne/Dyle-Gette	Pond	Manual removal
Hr8	*Hydrocotyle ranunculoides*	Ophain - Chemin Bertinchamps	Ophain	Wallonia	CR Senne/Dyle-Gette	Pond	Manual removal
Hr9	*Hydrocotyle ranunculoides*	Petit-Roeulx-Lez-Braine - Rue Saint Jean	Petit-Roeulx-Lez-Braine	Wallonia	CR Senne/Dyle-Gette	Pond	Manual removal
Hr10	*Hydrocotyle ranunculoides*	Seneffe - Bief 17	Seneffe	Wallonia	CR Senne/Dyle-Gette	Pond	Manual removal
Hr11	*Hydrocotyle ranunculoides*	Seneffe - Chemin des Roblets	Seneffe	Wallonia	CR Senne/Dyle-Gette	Pond	Manual removal
Hr12	*Hydrocotyle ranunculoides*	Villers-la-Ville - Rue de Dreumont	Villers-la-Ville	Wallonia	CR Senne/Dyle-Gette	Pond	Manual removal
Ig1	*Impatiens glandulifera*	Anderlecht - Vogelzangbeek	Anderlecht	BCR	BE	River bank	
Ig2	*Impatiens glandulifera*	Anderlecht - Neerpedebeek	Anderlecht	BCR	BE	River bank	
Ig3	*Impatiens glandulifera*	IJse catchment		Flanders	VMM, province Vlaams-Brabant	River bank	Manual removal
Ig4	*Impatiens glandulifera*	Laan catchment		Flanders	VMM, province Vlaams-Brabant	River bank	Manual removal
Ig5	*Impatiens glandulifera*	Mark catchment		Flanders	VMM, province Vlaams-Brabant	River bank	Manual removal
Ig6	*Impatiens glandulifera*	Braine-l'Alleud - PolyPeptyde	Braine-l'Alleud	Wallonia	CR Senne/Dyle-Gette		Manual removal
Ig7	*Impatiens glandulifera*	Braine-l'Alleud - UCB	Braine-l'Alleud	Wallonia	CR Senne/Dyle-Gette		Manual removal
Ig8	*Impatiens glandulifera*	Cala		Wallonia	CR Senne/Dyle-Gette	River bank and floodplain	Manual removal
Ig9	*Impatiens glandulifera*	Genappe - Mégaphorbiae	Genappe	Wallonia	CR Senne/Dyle-Gette		Manual removal
Ig10	*Impatiens glandulifera*	Hain		Wallonia	CR Senne/Dyle-Gette		Manual removal
Ig11	*Impatiens glandulifera*	Mark basin (upstream)	Enghien,...	Wallonia	CR Dendre	River bank and floodplain	
Ig12	*Impatiens glandulifera*	Lasne		Wallonia	CR Dyle-Gette	River bank	
Lg1	*Ludwigia grandiflora*	Court-Saint-Etienne - Barrage à Castors Marâche	Court-Saint-Etienne	Wallonia	CR Senne/Dyle-Gette	Pond	Manual removal
Lg2	*Ludwigia grandiflora*	Court-Saint-Etienne - Sart	Court-Saint-Etienne	Wallonia	CR Senne/Dyle-Gette	Pond	Manual removal
Lg3	*Ludwigia grandiflora*	Petit-Roeulx-Lez-Braine - Rue Saint Jean	Petit-Roeulx-Lez-Braine	Wallonia	CR Senne/Dyle-Gette		
Ma1	*Myriophyllum aquaticum*	Erasmus - Meylemeersch area	Anderlecht	BCR	BE		Manual removal
Ma2	*Myriophyllum aquaticum*	BLCh - Rue aux Racines 60 - Myriophylle	BLCh	Wallonia	CR Senne/Dyle-Gette	Pond	Manual removal
Ma3	*Myriophyllum aquaticum*	Grez-Doiceau - Rue de la Forêt	Grez-Doiceau	Wallonia	CR Senne/Dyle-Gette	Pond	Manual removal
Ma4	*Myriophyllum aquaticum*	Rixensart - Rue de Mahiermont	Rixensart	Wallonia	CR Senne/Dyle-Gette	Pond	Manual removal
Ma5	*Myriophyllum aquaticum*	Tubize - Chemin du Warichaix	Tubize	Wallonia	CR Senne/Dyle-Gette	Pond	Manual removal
Ma6	*Myriophyllum aquaticum*	Villers-la-Ville - Golf de la Bruyère	Villers-la-Ville	Wallonia	CR Senne/Dyle-Gette	Pond	Manual removal
Ma7	*Myriophyllum aquaticum*	Villers-la-Ville - Rue de Dreumont	Villers-la-Ville	Wallonia	CR Senne/Dyle-Gette	Pond	Manual removal
Ma8	*Myriophyllum aquaticum*	Ittre - Ecole communale	Ittre	Wallonia	Commune Ittre	Pond	

3. Annex 1 – Details of sites first managed prior to 2023

This annex provides an overview of management actions performed in 2021 and 2022 within the Life RIPARIAS project, i.e. before the official kick-off of action C3 in 2023.

3.1 Action PW02

3.1.1 Methodology

The small population of *Impatiens glandulifera* was removed by manual extraction.

3.1.2 Performed action

The small population of *Impatiens glandulifera* (40m², not evenly distributed) in Ganshoren (BCR) (50.880351 °N, 4.310021 °E) was removed by hand by one staff member of Brussels Environment (BE). All plants were removed in September 2021. By the check-up carried out in September 2022, only one flowering plant could be found. This plant was removed as well.

3.1.3 Result

The small population seems to be fully eradicated in 2022. A last check-up will be done in the summer of 2023, to ensure that there are no plants left.

Figure 17: Small population of Impatiens glandulifera in Ganshoren (before management). © Xavier Vermeersch (BE)

3.2 Action PW03

3.2.1 Methodology

A few plants of *Ludwigia grandiflora* were removed by manual extraction.

3.2.2 Performed action

A very small and emerging population of *Ludwigia grandiflora* (only 2-3 plants) was located in a pond in a marsh near Evere (BCR) (50.881421 °N, 4.393107 °E). The plants were manually removed in September 2021 by one staff member from BE.

3.2.3 Result

The location was revisited 2022 and the eradication of the small population was confirmed.

Figure 18: The small emerging population of Ludwigia grandiflora *located in Evere. © Xavier Vermeersch (BE)*

3.3 Action PW04 (see HR7 in Table 1)

3.3.1 Methodology

The small *Hydrocotyle ranunculoides* population was removed by manual extraction.

3.3.2 Performed action

The small population of 8 m² was manually removed by the private owner after being contacted by CRS. This population was located in Nivelles (50.602157 °N, 4.312875 °E) and was removed in September 2021.

3.3.3 Result

All plants were removed. However, some individuals were still present when checking the site in 2023. The site was visited several times in 2023 to remove any regrowth and will again in 2024.

Figure 19: Population of Hydrocotyle ranunculoides *(before management) located in Nivelles (Wallonia) © CRS*

3.4 Action PW05

3.4.1 Methodology

An immense population of *Ludwigia grandiflora* was found. The first attempt to eradicate the population was done by dredging. This population was not eradicated by this technique. Therefore, an extra attempt in the following year was performed by manual extraction.

3.4.2 Performed action

A surface of 250 m² was invaded by *Ludwigia grandiflora* in Braine-le-Comte (50.606395 °N, 4.151170 °E). In September 2021 the area was dredged by the Province du Hainaut (the personnel of Hainaut Ingénierie technique (HIT)). No further information was available on this action.

The check-up in 2022 revealed that the population was not eradicated by the management measure in 2021. The area invaded before the manual extraction in June 2022 was estimated as a small (25m²) and a large population (100 m²) of *Ludwigia grandiflora*. Both populations were partially managed by the joined forces of the municipality and CRS (8 people) in June 2022. Based on the mapping performed in October 2022, the invaded site was seriously underestimated.

3.4.3 Result

The small population seems to be eradicated, however a new population was discovered and the large population also came back. The management seems to have no impact on the large population, which was estimated to amount to +/- 3.000 m² in October 2022 based on mapping.

Figure 20: Management of a population of Ludwigia grandiflora *located in Braine-le-Comte (Wallonia). © Laure Lacroix (Municipality of Braine-le Comte)*

3.5 Action PW06 (see Lg2 in Table 1)

3.5.1 Methodology

A large population of *Ludwigia grandiflora* was removed by mechanical extraction, followed by manual aftercare.

3.5.2 Performed action

The pond of 250 m² situated in Court-St-Etienne was entirely covered by *Ludwigia grandiflora* in May 2022. First mechanical extraction was performed to remove the large cover of plants. From August until October 2022, there was manual aftercare to restrict the population. In total 5 people were involved in the eradication process. Follow up in 2023 took place to fully eradicate the population.

3.5.3 Result

The population was reduced. Follow up in 2023 took place and will continue in 2024.

3.6 Action PW07

3.6.1 Methodology

The *Hydrocotyle ranunculoides* population was removed by manual extraction.

3.6.2 Performed action

A population of 30 m² was found in Petit-Roeulx-Lez-Braine (50.624307 °N, 4.089338 °E). This population was managed by the private owner but he could not succeed to eradicate it. In 2023, the site was managed by the RIPARIAS team and full eradication was reached. This site will remain under surveillance for the following years.

3.6.3 Result

All plants were removed in 2023, but a check-up in 2024 will be necessary.

Figure 21: Population of Hydrocotyle ranunculoides *located in Petit-Roeulx-Lez-Braine (Wallonia). Pictures before (June 2022) and after the management (October 2022) © Dido Gosse & Caroline Dejonghe (CRS)*

3.7 Action PW08

3.7.1 Methodology

A small population of *Ludwigia grandiflora* was removed by manual extraction.

3.7.2 Performed action

A small population of 1 m² was detected in this property in 2022. In 2023, the site was managed by the RIPARIAS team and full eradication was reached. This site will remain under surveillance for the following years.

3.7.3 Result

All plants were removed from the site, however a check-up in 2024 will be necessary to ensure that the population is fully eradicated.

3.8 Action PW09

3.8.1 Methodology

A population of *Ludwigia grandiflora* was removed by manual extraction.

3.8.2 Performed action

The population located in the canal Leuven-Dijle (50.933478 °N, 4.675232 °E) was removed by the team Rat catchers of the VMM during their standard operations.

3.8.3 Result

All plants were removed from the site, but inspection in 2023 will be necessary to verify if the populations were completely eradicated.

3.9 Action PW10

3.9.1 Methodology

A population of *Ludwigia grandiflora* was removed by manual extraction.

3.9.2 Performed action

The population located in Haacht in the canal Leuven-Dijle (50.938612 °N, 4.667369 °E) was removed by the team Rat catchers of the VMM during their standard operations.

A) Result

All plants were removed from the site, but inspection in 2023 will be necessary to verify if the populations were completely eradicated.

3.10 Action PW12

3.10.1 Methodology

The small population of *Ludwigia grandiflora* was removed by manual extraction.

3.10.2 Performed action

The population of *Ludwigia* at Domain Hofstade (Zemst) (50.986192 °N, 4.503136 °E) was discovered by ANB-personnel during the monitoring of crayfish. The manager of the pond (Sport Vlaanderen) was informed, and their maintenance removed the population entirely from the artificial pond. Aftercare will be necessary to check if there is no regrowth from roots which were stuck between the stones.

3.10.3 Result

The population was removed fast after the discovery. It will be necessary to check for regrowth in 2023.

Figure 22: Small population of Ludwigia glandulifera *located in Zemst (Flanders). © Niels Schild (ANB)*

3.11 Action PW13

3.11.1 Methodology

A population of *Ludwigia grandiflora* was removed by manual extraction.

3.11.2 Performed action

The population located in Boortmeerbeek (50.999642 °N, 4.550409 °E) was removed by the team Rat catchers of the VMM during their standard operations.

A) Result

All plants were removed from the site, but inspection in 2023 will be necessary to verify if the populations is completely eradicated.

3.12 Action PW14 (see Hr10 in Table 1)

3.12.1 Methodology

A population of *Hydrocotyle ranunculoides* was removed by manual extraction.

3.12.2 Performed action

The population of 25 m² was located in Seneffe (50.554691 °N, 4.283895 °E). This population was removed in October 2022 by 6 people working for CRS and DNF.

3.12.3 Result

All plants were removed from the site. Management continued in 2023, as eradication will be very difficult to reach : the plants are mixed with reeds and other plants, this site will be managed every year in the future.

Figure 23: Management of a Hydrocotyle *population located in Seneffe (Wallonia). © Christine Bodmer (CRS)*

PW15

Small spot of *Heracleum mantegazzianum* of about 10m^2 on the bank of the Neerpedebeek in Anderlecht. The root was cut with a spade and the plants were removed, no regrowth was observed in 2023.

PW02	September 2021	BCR	Ganshoren	BE	*Impatiens glandulifera*	40m² (small patch, not evenly distributed)	Manual extraction	1 person	All plants removed
	September 2022					1 flowering plant	Manual extraction	1 person	Plant removed and destroyed
PW03	September 2021	BCR	Evere	BE	*Ludwigia grandiflora*	2-3 small plants	Manual extraction	1 person	Plants removed and destroyed
PW04	September 2021	Wallonia	Nivelles	CRS	*Hydrocotyle ranunculoides*	8 m²	Manual extraction	1 person	All plants removed
PW05	September 2021	Wallonia	Braine-Le-Comte	CRS/HIT	*Ludwigia grandiflora*	250 m² before dredging	Dredging	NA	NA
	June 2022			CRS		25 m² + 100 m² (underestimated) +/- 3.000 m² (mapping)	Manual extraction	8 people	Small part removed
PW06	May-October 2022	Wallonia	Court-St-Etienne	CRDG	*Ludwigia grandiflora*	250 m² (Pond totally covered)	Mechanical extraction & Manual aftercare	5 people	All plants removed
PW07	June 2022	Wallonia	Petit-Roeulx-Lez-Braine	CRS	*Hydrocotyle ranunculoides*	30 m²	Manual extraction	1 person	All plants removed
	October 2022					Some new plants removed			
PW08	June 2022	Wallonia	Petit-Roeulx-Lez-Braine	CRS	*Ludwigia grandiflora*	1 m²	Manual extraction	1 person	All plants removed
	October 2022					Some new plants removed			
PW09	June 2022	Flanders	Leuven	VMM	*Ludwigia grandiflora*	NA	Manual extraction	1 person	All plants removed
PW10	June 2022	Flanders	Haacht	VMM	*Ludwigia grandiflora*	NA	Manual extraction	1 person	All plants removed
PW12	August 2022	Flanders	Zemst	ANB - Sport Vlaanderen	*Ludwigia grandiflora*	Small population on pond bank	Manual extraction	2 people	All plants removed
PW13	September 2022	Flanders	Boortmeer-beek	VMM	*Ludwigia grandiflora*	NA	Manual extraction	1 person	All plants removed
PW14	October 2022	Wallonia	Seneffe	CRS	*Hydrocotyle ranunculoides*	25 m²	Manual extraction	6 people	All plants removed

PW15	September 2022	BRC	Anderlecht	BE	*Heracleum mantegazzianum*	10 m^2	Manual extraction	2 people	All plants removed

4. Annex 2 – Overview of *Heracleum mantegazzianum* management in Wallonia (Dyle-Senne basin), with indication of plant abundance

BV	commune	x	y	latitude	longitude	Nplantesretirées
Dyle	Beauvechain	175848	162958			[1-10]
Dyle	Beauvechain	175723	163170			[1-10]
Dyle	Genappe	160431	148497			[11-100]
Dyle	Ottignies-Louvain-la-Neuve	165189	149771			[1-10]
Dyle	Lasne	157436	150280			[11-100]
Dyle	La Hulpe	158357	158579			[11-100]
Dyle	Lasne	158060	152346			[1-10]
Dyle	Court-Saint-Etienne	164414	145708			[1-10]
Dyle	Walhain	173900	148826			[1-10]
Dyle	Beauvechain	175898	163311			[1-10]
Dyle	Lasne	154344	154761			[1-10]
Dyle	Ottignies-Louvain-la-Neuve	163504	152393			[1-10]
Dyle	Rixensart	160459	155061			[1-10]
Dyle	Villers-la-Ville	162778	138794			[1-10]
Dyle	La Hulpe	158227	158455			[1-10]
Dyle	Ramillies	186166	151522			[1-10]
Dyle	Mont-Saint-Guibert	167313	145949			[1-10]
Dyle	Walhain	170457	147341			[11-100]
Dyle	Villers-la-Ville	159551	139708			[101-1000]
Dyle	Lasne	157433	150355			[1-10]
Dyle	Beauvechain	176046	162599			[1-10]
Dyle	Villers-la-Ville	161840	137146			[1-10]
Dyle	Villers-la-Ville	162407	138787			[1-10]
Dyle	Ottignies-Louvain-la-Neuve	164322	151223			[11-100]
Dyle	Lasne	157539	152461			[11-100]
Dyle	Walhain	171820	148308			[1-10]
Dyle	Ottignies-Louvain-la-Neuve	167952	151343			[1-10]
Dyle	Lasne	157013	154200			[1-10]
Dyle	Genappe	155181	142924			[1-10]
Dyle	Rixensart	160363	155385			[11-100]
Dyle	Beauvechain	178344	163217			[11-100]
Dyle	Lasne	155127	155249			[11-100]
Dyle	Lasne	155179	155285			[1-10]
Dyle	Lasne	155194	155289			[1-10]
Dyle	Rixensart	162551	157564			[11-100]
Dyle	Lasne	154268	154833			[11-100]
Dyle	Villers-la-Ville	163976	138789			[11-100]
Dyle	Lasne	155297	155416			[11-100]
Dyle	Lasne	155183	155383			[11-100]
Dyle	Villers-la-Ville	162146	137352			[11-100]
Dyle	Rixensart	162787	158647			[1-10]
Dyle	Beauvechain	175894	163271			[1-10]
Dyle	lasne	158134	151750			[1-10]
Dyle	Beauvechain	176141	162557			[1-10]
Dyle	Beauvechain	175772	163184			[11-100]
Dyle	Beauvechain	175876	163247			[1-10]
Dyle	Beauvechain	175739	163191			[1-10]
Dyle	Beauvechain	175773	163126			[1-10]
Dyle	Beauvechain	175736	163109			[1-10]
Dyle	La Hulpe	156458	157898			[11-100]
Dyle	Beauvechain	175758	162943			[1-10]
Senne	Braine-l'Alleud UCB			50,693821	4,341445	[1-10]
Senne	Braine-l'Alleud Rue Boularmont			50,685053	4,310601	[1-10]
Senne	Seneffe Renissart			50,552751	4,294888	[11-100]
Senne	Braine-l'Alleud Comte de Meeus			50,645882	4,37654	[1-10]
Senne	Braine-l'Alleud Friche Rue du Ménil			50,69012	4,386355	[1-10]