

River Beult SSSI

Non Native Species Control Programme 2010

Project Report



Medway Valley Countryside Partnership (MVCP)

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1.1 Abstract:

Medway Valley Countryside Partnership (MVCP) carried out giant hogweed control along the Beult SSSI, Teise and Lesser Teise rivers in 2010 as part of a their Environment Agency funded giant hogweed programme. Via additional Natural England funding MVCP was able to extend this control programme and include treatment of Japanese knotweed and Himalayan balsam on these river systems in 2010. MVCP contacted over 120 local landowners about the scheme and chemical treatment began in the spring. All target plants in the area were chemically treated and survey data indicates a drop in all three target species including a drop in Himalayan balsam at a target site of around 30%. Data also indicates however the ongoing plant recruitment from the extensive seed-bank and thus the importance of future and ongoing control.

1.2 Introduction to River Beult SSSI Non Native Species Control Programme:

The River Beult is 24.8km/15.5 miles long and runs from its source upstream of Headcorn to where it joins the River Medway at Yalding in Kent.

It runs over Wealden clay for most of its length and has a characteristic flora of this geology with over 100 associated riparian species recorded. The river is one of few clay rivers not to have been extensively canalised and many sections of the river were designated as SSSI in 1994 (Natural England 2010).

The Medway Valley Countryside Partnership (MVCP) delivers a variety of projects in the boroughs of Tonbridge and Malling and Maidstone in Kent. These projects include countryside management, assisting landowners with grants and increasing awareness of the local countryside via events and recreation. Since 2000 MVCP have been delivering the Giant Hogweed Control Programme along the rivers Medway, Beult, Lesser and Greater Teise and Gibbs Brook (tributary of the Eden) with significant successes.

Due to the partnership's existing project delivery, in 2009 Natural England approached MVCP regarding the delivery of a Beult SSSI Non Native Species Control Programme for 2010. This river system is already covered by the MVCP giant hogweed project but the additional NE project would allow Himalayan balsam and Japanese knotweed to be addressed where feasible and to allow for increased treatment of giant hogweed where required.

These three species; giant hogweed (GH) (*Heracleum mantegazzianum*), Japanese knotweed (JK) (*Fallopia japonica*) and Himalayan balsam (HB) (*Impatiens glandulifera*) will be referred to in this report either by their common name initials or collectively as the projects target species.

In preparation for the 2010 project delivery, MVCP carried out some surveying in late summer/early autumn 2009. This survey highlighted that the source of the non native species for the Beult was the River Teise and Lesser Teise. The Lesser Teise is 6.4km long from the bifurcate with the Teise before it flows into the Beult approximately 2.5km from Yalding.

For this reason, the upper sections of the Teise and the Lesser Teise were included in the project plan and target species on these rivers were included as part of the project in an attempt to greater safeguard the Beult and make the project more sustainable and successful in the longer term.

Adding the Lesser Teise and Teise to the Beult for the purposes of this project resulted in approximately 41km of riparian habitat treated via this project in 2010.

As an addition to an earlier 2010 report, this report highlights the overall work done by MVCP in 2010 for the Beult SSSI Non Native Species Control programme with results and recommendations for the future.

1.3 Project Delivery:

As an extension of the giant hogweed control programme communication, MVCP contacted approximately 120 landowners along the Beult informing them about the MVCP/NE Non Native Species Control Programme and requesting, where required, permission for treatment of target plants to be carried out. In addition MVCP liaised with Yalding Parish Council who were fully supportive of the additional scheme.

Following meetings it was agreed with Yalding Parish Council that the area known as The Tatt, adjacent to Yalding Bridge be subject to extensive Himalayan balsam control in 2010 as part of the scheme.

Some baseline surveying was carried out by MVCP to ascertain the abundance of the target plants via early spring growth. In addition to landowner communication, publicity and press releases were written and interpretation was placed in the area. Following these activities, as in prior years with the giant hogweed control programme, FCS Vegetation Care and Control began the chemical treatment of the

target plants along the Teise, Lesser Teise, Beult and the Tatt in Yalding in spring 2010.

The treatment methodology for all the target plants was a spot spray with Glyphosate and Codacide Oil mixture. This is approved for us by waterways by the Environment Agency. The Glyphosate controls all the target species and the spot treatment ensures that other riparian vegetation is not indirectly effected. The mixture with Codacide Oil ensures better rainfastness and greater intake of the chemicals by the target plants and also reduces the chances of any drift, further safeguarding surrounding vegetation.

MVCP/FCS Vegetation Care and Control had all the preapproved E.A permission for the target plants to be treated adjacent to the relevant water bodies prior to project commencement.

Spot treatment of giant hogweed on the Teise and Beult began in April 2010.

Japanese knotweed treatment began in July 2010 with second treatments carried out in early September.

Himalayan balsam treatments were carried out on the Tatt from April 2010 and periodically throughout the summer in an attempt to reduce the seed-bank of HB on the Tatt.

The source of the HB problem for the Beult (and Tatt) is the Teise and upstream in this location it was considered unfeasible to control HB chemically. Due to its abundance either a large team hand pulling in accessible areas or a blanket spray treatment method would be required to control the HB. The former could not be accomplished in 2009 and the latter was not considered justifiable both due to the economic cost but, more importantly, due to the negative effect this would have on the other riparian vegetation (which is currently important in its diversity along the Beult). Therefore apart from the Tatt, at this stage Himalayan balsam has not been addressed but will be addressed in 2011 pending additional project funding.

Whilst chemical treatment of the target plants was being undertaken, MVCP carried out surveys of the Tatt, Beult, Lesser Teise and Teise (where feasible). These surveys both highlighted areas where target plants were and also noted successful die back of plants following treatment.

Some surveying of sections of the Tatt and Beult started in April 2010 and continued throughout the summer. The Teise and Lesser Teise were surveyed (where access allowed) in June and July 2010.

From 2009 and the early discussions of the project to the end of plant treatments and project writing in 2010, MVCP staff time equals approximately 150 hours with considerable hours also logged by FCS Vegetation Care and Control.

1.4 Location information and treatment results for the target species along the three river systems:

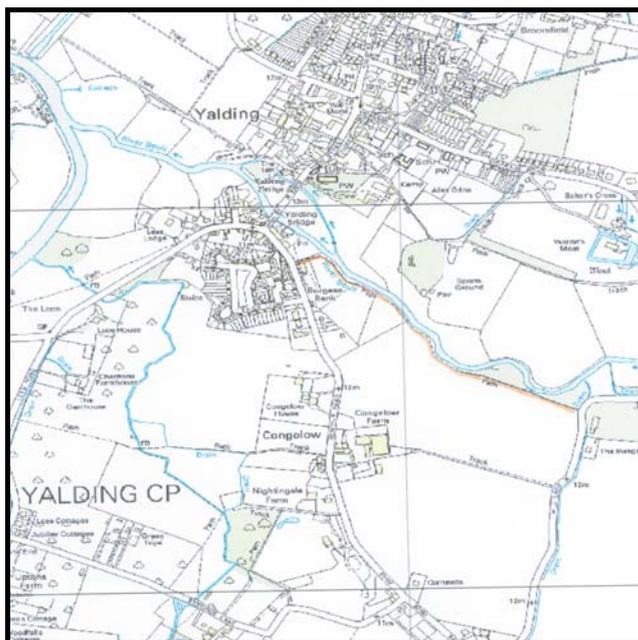
It was not feasible, or required, to monitor the entire length of the Beult, Lesser Teise and Teise frequently, especially for some of the target species such as HB.

Instead several individual surveys were carried out along sections of the three rivers (with some exceptions on the Teise) in June and July 2010. These surveys allowed target species to be logged and successful treatment to be noted.

In addition to these individual surveys the area just upstream of Yalding (where the target species are most abundant along the Beult) was chosen to be a sample section of the Beult for regular representative surveying throughout 2010.

This 1.450 metre section of the river Beult chosen for the repeat surveys was between Yalding village and Mill Lane. This stretch is easily accessible along the adjacent footpath and is highlighted in Figure 1:

Figure 1: Map showing transect route (orange line) for repeat target species surveys on the Beult.



Map generated from Kent Landscape Information Systems (KLIS).

1.4.1: Giant Hogweed on the Beult

All the GH in the sample section was logged and recorded prior to treatment and again after the first treatment to assess success.

Using the sample section as a representative of the entire Beult it was clear that the majority of the GH plants were eliminated during the first treatment. Surveying of the sample section did highlight some re-growth and/or second plants growing from the seed-bank so in this area a second spray took place.

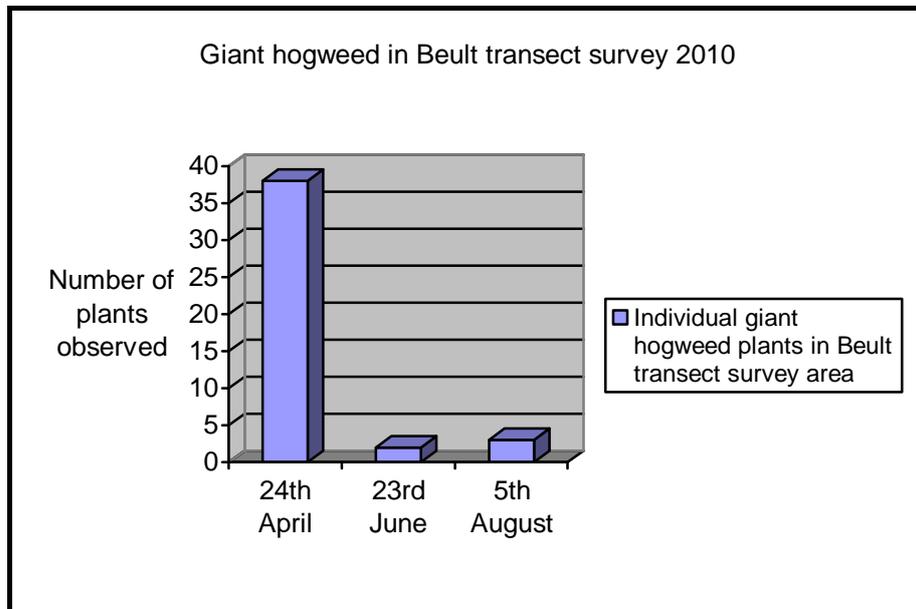
A final survey was carried out in the sample location in August to establish if second spraying in this location had been successful.

Giant hogweed is frequent along the Beult downstream from the confluence with the Lesser Teise approximately 2.5km above Yalding. Upstream of the confluence there are no giant hogweed plants, thus supporting the hypothesis that the Lesser Teise and Teise are the source for this invasive species on the Beult.

(See Appendix 1 for location data for GH stands in this section of the Beult).

Figure 2 below shows giant hogweed abundance in the sample section of the Beult near Yalding. The graph highlights the reduction of plants following 2010 treatment:

Figure 2: Graph showing giant hogweed abundance data from surveys both pre-treatment (24th April) and following two treatments (23rd June) and (5th August).

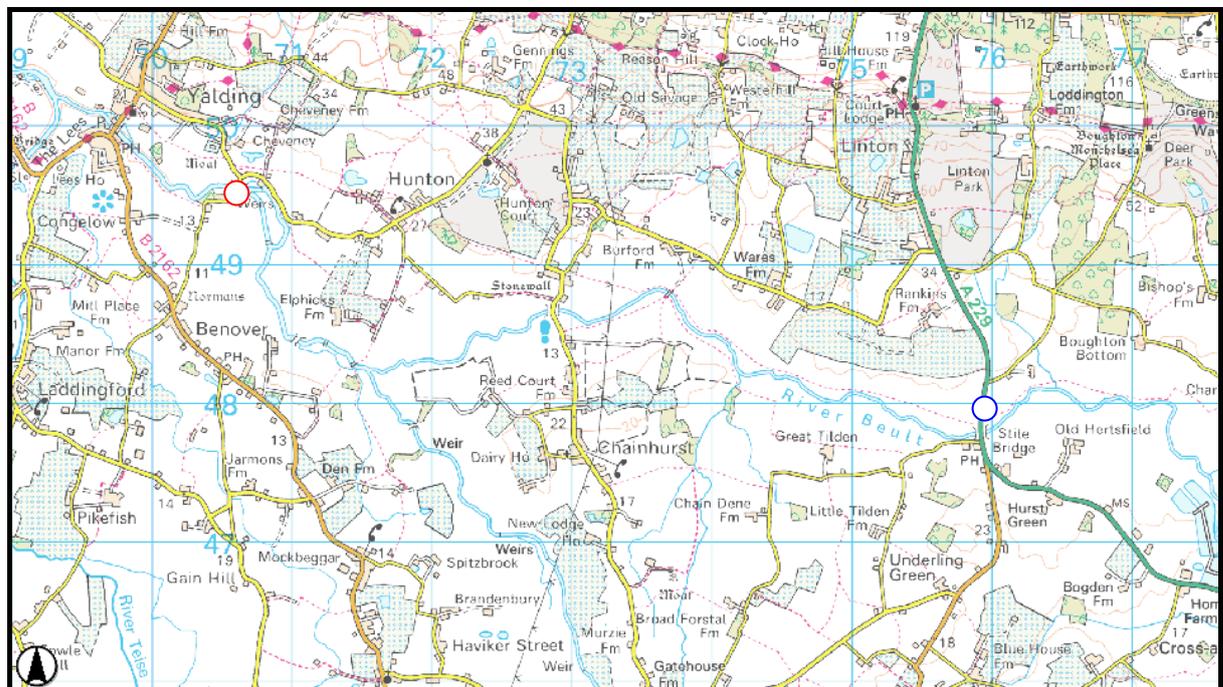


(See Appendix 1 for original survey date table).

The graph (Figure 2) highlights the reduction in the giant hogweed plants following the projects treatment plan in the area. If this transect area of the Beult is used as a representation of the whole river and other areas affected by giant hogweed it can be assumed that a similar success rate has occurred throughout the project area. However, as highlighted via the data from 5th August, new growth from the seed-bank always occurs and although these will not flower (giant hogweed plants are biennial – growing for several years but usually dying after flowering and setting seed) this growth highlights the ongoing problem due to the seed-bank. Future treatments are obviously essential to ensure ongoing control.

Outside the sample transect section the river Beult was surveyed in July 2010 by boat. This survey took place after plant treatment. As shown in Figure 3 this boat survey took place from Cheveney Mill (red circle on map) in Hunton to Stilebridge (blue circle on map) and covered approximately 10km of the river, thus taking in a section of the Beult both downstream and mainly upstream of the Lesser Teise confluence.

Figure 3: Map showing Beult boat Survey area:



Map generated from Kent Landscape Information Systems (KLIS).

This survey by boat in July logged stands of giant hogweed at the following co-ordinates:

TQ 70553 48927

TQ 70987 48932

TQ 71150 48766

All the plants in these stands had evidence of die back following treatment although, like in the transect sample section some additional growth from the seed-bank had occurred.

Giant Hogweed was also observed on the Tatt in Yalding itself. There were 12 plants at the end of the Tatt below Swan Place: TQ 69762 50082. This area was monitored during Tatt surveying and additional GH spraying was undertaken during Tatt HB spraying. All recorded plants were eliminated in the growing season, but this section of the Tatt is likely to have a considerable GH seed bank.

4.4.1.1: Giant Hogweed on the Teise

Surveying on the Teise and Lesser Teise took place in early June. Some additional surveys of the Lesser Teise then took place at the same time as the Beult boat survey on 13th July:

Figure 4: Giant hogweed data for the Teise and Lesser Teise.

	Survey Date	Grid Ref	Plant density/abundance	GPS note and location
Teise	09/06/10	TQ 67776 36260	1 plant	GHUPTei1
		TQ 67882 36188	1 plant	GHUPTei2
		TQ 68227 36278	1 plant	GHUPTei3
		TQ 69261 35349	1 plant	GHUPTei4
L.Teise	09/06/10	TQ 72443 40781	1 plant	GH-LT1
	-	TQ 72563 41205	1 plant	GH-LT2
	-	TQ 72831 41227	1 plant	GH-LT3
	-	TQ 73001 41140	1 Plant	GH-LT4
	-	TQ 72894 41335	1 Plant	GH-LT5
	-	TQ 72683 41268	2 Plants	GH-LT6
	-	TQ 72811 41474	1 Plant	GH-LT7
	-	TQ 72852 41709	1 plant (opposite bank)	GH-LT8
	-	TQ 72568 42386	1 plant in flower)	GH-LT9
	-	TQ 72861 42006	1 plant	GH-LT10
	-	TQ 72807 42152	4 plants (3 on opposite bank)	GH-LT11
	-	TQ 72508 40730	3 plant (opposite bank)	GH-LT13
	13/07/10	TQ 71776 42050	2 plants (dying)	GH L Tei 1

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-	TQ 71720 47902	4 plants (dying)	GH L Tei 2
-	TQ 71881 48309	1 plant (dying)	GH L Tei 3
-	TQ 71839 47767	4 plants (dying)	GH L Tei 4
-	TQ 71746 47980	1 plant	GH L Tei 5
-	TQ 72042 47599	2 plants	GH L Tei 6
-	TQ 71996 47605	1 plant	GH L Tei 7
-	TQ 72240 47698	2 plants	GH L Tei 8

All of the plants logged in Figure 4 were treated and, as indicated, there was some evidence of die back at the time of surveying.

The main section of the Teise is difficult to survey due to access issues but contractor notes indicate that on the Teise itself approximately 500 individual giant hogweed plants were treated in 2010

1.4.2: Japanese Knotweed on the Beult and Teise

In 2010 there were several stands on JK reported in Yalding itself which were also treated. Along the river two stands of JK, adjacent to each other either side of the river were observed on the Beult itself at Stilebridge. Apart from a few stems of HB, this was the only stand of non native vegetation on the Beult above the Lesser Teise confluence and is probably the result of rubbish dumping by the bridge.

On the south side of the river on the corner of Stilebridge Lane the stand is approx 12m² (Plate 1) the stand on the opposite bank was somewhat smaller in size but closer to the water body:

TQ 75815 47694

TQ 75982 47709



Plate 1: JK at Stilebridge on the Beult. TQ 75815 47694

Via this programme the JK on the Beult was treated in July and September. There are only a small number of JK stands on the Beult but in order to safeguard the system ongoing treatment of these will be required.

On the Teise the areas of JK are extensive and it was deemed necessary to treat these plants in order to safeguard the habitat health of the Beult in the long term.

In Lamberhurst on the Teise there is an extensive stand of JK near the 'The Chequers Inn' public house (TQ 67524 36235). Here one stand of JK approximately 25m² dominated the riparian habitat from the public house garden (Plate 2)

Slightly further downstream on the Teise in Lamberhurst, adjacent to the playing fields the JK stretches in one continuous stand approximately 50m downstream (Plate 3).



Plate 2: JK in pub garden in Lamberhurst 2010 - TQ 67524 36235

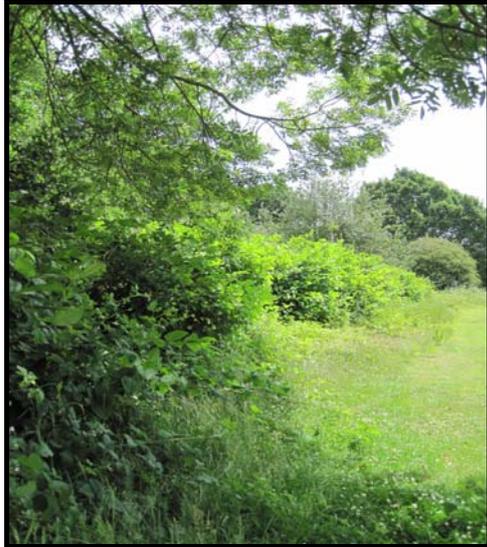


Plate 3: JK stretching along the Teise downstream in Lamberhurst.

Witness reports in the area state that the JK has spread dramatically. In order to safeguard the L.Teise and subsequently the Beult, this stand of JK was treated in July 2010. Early reports (Box 1) state that the first spray treatment was very affective, however due to the denseness of the stands another spray treatment was carried out in September 2010 when the plants were in flower.

Figure 5: Additional grid references for Japanese knotweed stands on the Teise. Each of these stands was treated in 2010 as part of this Beult SSSI Non Native Species Control Programme.

Japanese Knotweed on Teise 2010.	Survey date 30/06/10	TQ 67643 36250
-	Treatment date 21/07/10	TQ 68989 36520
-	-	TQ 68823 36540
-	-	TQ 68805 36562
-	-	TQ 68778 36518
-	-	TQ 68640 36544
-	-	TQ 68592 36592
-	-	TQ 68592 36505
-	-	TQ 68508 36459
-	-	TQ 68457 36466
-	-	TQ 68370 36458
-	-	TQ 68252 36291

Box 1: Landowner statement following Japanese Knotweed treatment on the Teise in Lamberhurst:

Dear Andrea (MVCP)

This is just a quick letter to say thank you for the knotweed spraying your team carried out, it has really made a big difference to the riverbank & will hopefully allow the native species to re- establish themselves. The evasive nature of the knotweed was really causing problems all along this stretch of river bank & I am so glad a start has been made in getting rid of it forever. There are still many areas that will need a second or even third spray but already the difference is huge!

Thank you again & keep up the good work,

Kindest regards

Nigel Hilton

The Chequers Inn

Lamberhurst

Kent

TN3 8DB

1.4.3 Himalayan balsam:

HB is frequent in its distribution on the Beult in the Yalding area. 2009 and 2010 surveying indicated that the species comprises approximately 20% of the riparian habitat along the Beult downstream of the confluence with the L.Teise.

No GPS readings were taken as the plants frequency of occurrence is too extensive to take individual readings.

Although frequent, at present the abundance of HB on the Beult is still reversible and we feel reducing the HB on the Beult and controlling it on the source systems is achievable over time.

HB on the Teise and Lesser Teise is more extensive; in Lamberhurst on the Teise for example the HB dominates and in places makes up approximately 90% of the visible flora in the area as highlighted in Plate 5.



Plate 5: Large areas of HB in Lamberhurst along the Teise – June 2010.

For these reasons it was considered unfeasible to treat as spot spraying would not be possible and blanket treatment of the entire riparian flora could not be justified. The Teise and Lesser Teise will need attention in future to safeguard the section of the Beult downstream of the confluence.

1.4.3.1 Himalayan Balsam Control 2010 - Yalding – The Tatt

Methodology:

On the Tatt in Yalding, the land is more enclosed and due to the extensive abundance of Himalayan Balsam over other riparian species, herbicide treatment was carried out here throughout 2010 in an attempt to reduce the seed bank and improve the condition of the habitat.

A random sample using a 0.5m Frame Quadrat was used to establish density and frequency of Himalayan Balsam on the Tatt both before and after treatment.

The Tatt is the land to the north of the stream (the opposite bank not generally considered to be part of the Tatt and not as badly affected by non native species). At its longest point The Tatt is approximately 100m x 17m. Frequent surveys were carried out to monitor the reduction of HB after treatment and record the subsequent

generation of germinating plants. Between April and September three treatments were carried out on site.

Quadrat plots were randomly chosen. Surveys were random in order to reduce the possible bias of placing the quadrat in an area noted for high density and also allowed for a suitable representative coverage of the site.

During each survey session, 10 quadrat samples were observed and within each quadrat the density and frequency of occurrence were recorded.

Density of HB was calculated simply by counting each HB plant in each quadrat. The mean count after 10 quadrats was used to give a density figure for that survey session.

Frequency was measured by counting the number of quadrats where HB occurred regardless of density or cover. For example if HB occurred in 3 out of 10 quadrat samples, frequency of occurrence would be 30% and can be seen as representative for the whole site in question.

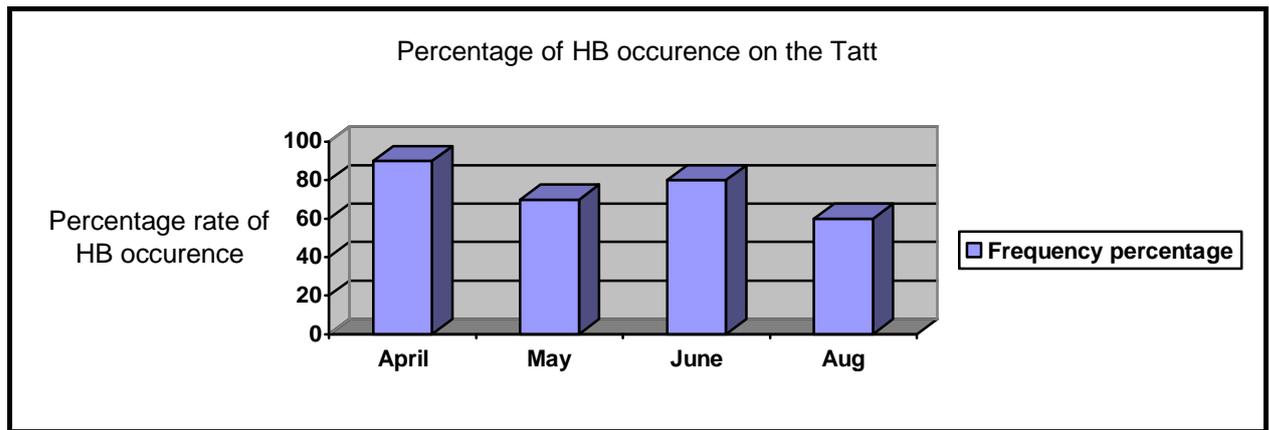
Each of these observations was noted to give a representation of HB before and throughout the treatment seasons in 2010.

Results:

April was the baseline survey with HB numbers recorded prior to any treatment. Following this survey, herbicide application occurred. Alternate spraying and surveying took place until June. Following chemical treatment a dense growth of nettles was observed. In July the area was strimmed to reduce the height of these nettles and reduce shade so another generation of HB could germinate. Surveying or chemical treatment was therefore not carried out in July due to this mechanical nettle reduction. The tops of some of the newly germinating HB plants were removed during this strimming activity but follow up surveying in August was still able to be carried out prior to another spray treatment.

Figure 6 highlights the frequency / occurrence percentage of the HB on the Tatt in 2010. Figure 7 demonstrates the density of HB on the site before and after treatment.

Figure 6: Frequency of HB occurrence on the sample site - 2010.



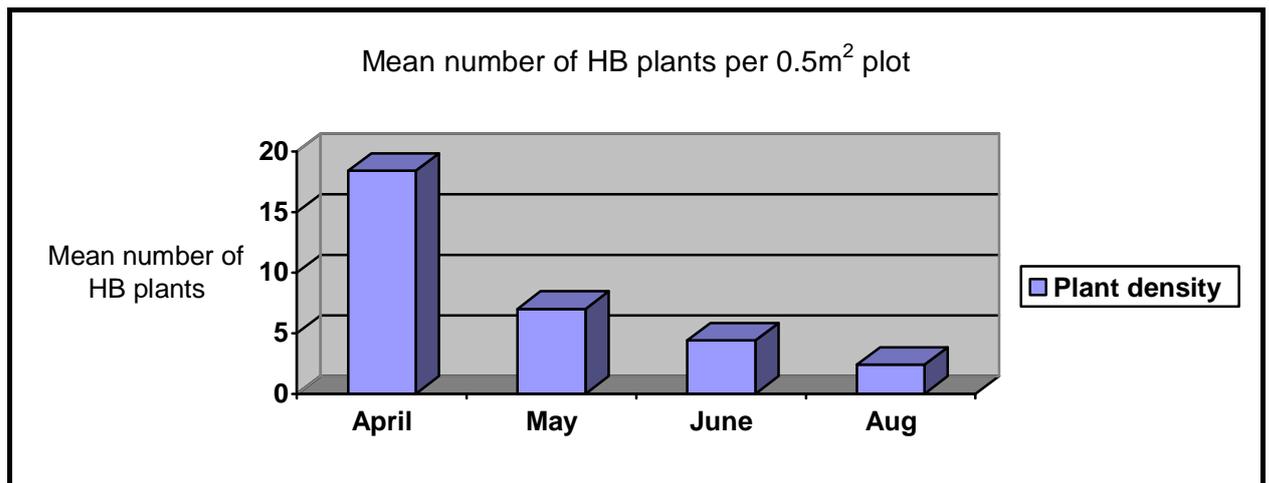
Data from figure 6 highlights that in April 2010 90% of the Tatt area had some HB growing in it. Although there were other native species present the frequency of HB across the site was, and remains, substantial. In May occurrence percentage fell to 70% but increased slightly with new germinating plants in June.

After two treatments, in August the percentage of occurrence had fallen to 60%. This shows a 30% reduction of HB on the site to date.

A final treatment in September was carried out.

The seed-bank will be extensive and future treatment and ongoing surveying is therefore required.

Figure 7: Plant Density – the mean number of HB plants in a 0.5m² quadrat sample plot:



Along with a slight reduction in the rate of occurrence as highlighted in figure 6, figure 7 highlights that the actual number of HB plants recorded in each sample plot also reduced throughout the treatment programme.

Before treatment in April 18.4 HB plants was the average plot data from 10 quadrats (I.E for every 0.5m² plot there was an average of 18.4 HB plants).

In August the density average was recorded as 2.4 plants per plot. Therefore data shows a potential drop in density of around 16 plants per 0.5m² of the site.

This reduction may indicate that the seed-bank was reducing as there were fewer recruited plants as the year progressed.

Further surveying in 2011 will be needed to indicate how successful the HB removal on site has been however as some plant recruitment from the seed-bank is guaranteed. Due to this seed-bank without ongoing treatment on the Beult, HB frequency and density will again increase on the Tatt in future.

1.5: Future Recommendations

The positive effects of the extensive giant hogweed and Japanese knotweed treatments which took place in 2010 are evident from data and landowner feedback. In addition the reduction in the abundance of Himalayan balsam, despite its ongoing occurrence, is also evident from the quadrat surveying carried out on the Tatt in Yalding. A greater increase in local landowner inclusion and public awareness about the ongoing affects of non native species has been another outcome of this project.

Non native species control, especially that of invasive flora must be considered for the long term. The main issue with invasive weeds is the subsequent recruitment of plants from the extensive seed-bank and this is evident from MVCP's ongoing giant hogweed control programme. Treatment of the target plants on the Tatt and along the Beult and Teise will only be worthwhile if continued as all target species will either have an extensive seed bank or continue to spread from existing stock.

At present, the Beult especially is only partially affected by these invasive plants. With ongoing treatment on the Teise and Lesser Teise the Beult will be better defended in the coming years and ongoing treatment on the Beult will continue to control any invasives which do infiltrate the banks of this SSSI. In short, ongoing funding of non native species flora is required for 2011 and subsequent years.

MVCP are hoping to start a volunteer group to manually remove the Himalayan balsam in the future.

This will ensure that the Himalayan balsam is addressed in certain accessible areas without the use of chemicals and again that public inclusion in non native species

control and environmental connectivity increases. Again, like the ongoing chemical treatment programme, funding is required. MVCP are researching and looking into potential funders and partners for this project.

As well as increasing the threats to our infrastructure, economy and human and livestock health, invasive non native species reduce biodiversity considerably due to a reduction in habitat availability for native flora. Due to the NE/MVCP Beult SSSI Non Native Species Control Programme 2010, a reduction in the target invasive flora has been documented but this success will be short lived without ongoing work.

The Beult SSSI is an important and diverse area ecologically and MVCP hopes that future investment in safeguarding it from non native invasive species will continue.

References

Natural England (2010) SSSI Citation [Online] Available from
http://www.sssi.naturalengland.org.uk/citation/citation_photo/1005993.pdf

River Beult SSSI Non Native Species Control Programme.
Medway Valley Countryside Partnership - Project Report (2010)

Appendix 1:

Table of Results from Beult Transect Survey (see Figure 1) before (24/04/10) and then after treatments (23/06/10 and 05/08/10)

River Beult (sample survey) Yalding, Kent	Date	Grid Ref	Plant density/abundance	Notes
	24/04/10	TQ 69840 49881 (GH-B1)	3 Plants	Lots of very small HB
	23/06/10		1 Plant remaining	
	05/08/10		No Plants observed	
	24/04/10	TQ 70013 49711 (GH-B2)	3 Plants	Plants here were very large already.
	23/06/10	-	No plants observed	Evidence of plant die back following treatment
	05/08/10	-	No plants observed	
	24/04/10	TQ 70062 49647 (GH -B3)	15 Plants	Most on far side of the river.
	23/06/10	-	No plants observed	Evidence of plant die back following treatment
	05/08/10	-	No plants observed	
	24/04/10	TQ 70069 49622 (GH-B4)	5 Plants	4 on opposite bank 1 on survey footpath side
	23/06/10	-	1 Plant	Evidence of plant die back following treatment. 1 plant remaining on footpath - removed manually during surveying.
	05/08/10	1	3 plants	1 plant (new growth) on footpath manually removed during surveying. 2 plants (new growth) on opposite bank. Nothing in flower indicating newly germinated plant which will not flower in their 1 st year.

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	24/04/10	TQ 70101 49590 (GH-B5)	5 Plants	1 plant on far side, 4 on footpath!
	23/06/10	-	No plants observed	No plants observed
	24/04/10	TQ 70125 49577	7 Plants	Some on footpath! Lots of small HB
	23/06/10	-	No plants observed	
	05/08/10	-	No plants observed	

Appendix 2:

Tatt HB Quadrat Surveying:

Date	Quadrat	Cover %	Frequency	Density
April	1	8	yes	3
	2	5	yes	3
	3	0	no	0
	4	12	yes	24
	5	50	yes	73
	6	6	yes	6
	7	35	yes	34
	8	10	yes	11
	9	1	yes	2
	10	20	yes	28

Date	Quadrat	Cover %	Frequency	Density
May 28 th	1	0	No	0
	2	9	Yes	7
	3	8	Yes	5
	4	20	Yes	10
	5	0	No	0
	6	30	Yes	23
	7	18	Yes	10
	8	10	Yes	10
	9	5	Yes	5
	10	0	No	0

Date	Quadrat	Cover %	Frequency	Density
June 23 rd	1	30	Yes	11
	2	2	Yes	1
	3	10	Yes	7
	4	30	Yes	11
	5	2	Yes	1
	6	0	No	0
	7	4	Yes	1
	8	2	Yes	2
	9	10	Yes	10

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	10	0	No	0
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Date	Quadrat	Cover %	Frequency	Density
Aug 5 th	1	20	Yes	4
	2	0	No	0
	3	0	No	0
	4	2	Yes	1
	5	80	Yes	10
	6	10	Yes	3
	7	0	No	0
	8	0	No	0
	9	10	Yes	4
	10	2	Yes	1