A

SURVEY OF THE DRAGONFLIES AND BUTTERFLIES

OCCURING ON

SELECTED NORTHUMBRIAN WATER SITES

IN COUNTY DURHAM

2008

By

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Submitted

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Introduction.

This report is the seventh of a series which commenced in 2002, which examined various water bodies of various types, within the landholdings of Northumbrian Water in the counties of Northumberland, Durham and North Yorkshire for the occurrence of Dragonfly and Butterfly species present.

All of the sites visited during the previous surveys have consisted mainly of Reservoirs, ponds, aqueducts, and various sewage and water treatment plants. This year's survey took in two sites where there was no suitable Dragonfly breeding habitat present. These sites were Lockhaugh STW., near Rowland's Gill and Hustledown STW., near Stanley, both sites being in Co. Durham. The Lockhaugh site was found to have several dragonfly species visiting it frequently, because of the abundance on this site of the small flies (Diptera sp.) that they feed on. An adjacent Nature Reserve and the River Derwent are the source of origin of the Dragonflies seen here. No Dragonflies were found at Hustledown STW.

In recent decades (1960's onwards) there has been a constant and well recorded northward advancement in the distribution of many insect species including Dragonflies and Butterflies and other insect orders. This is currently attributed to an almost imperceptible increase (to humans) in average air temperatures attributed to Global Warming Theory. Whilst this is a contentious subject, predictions in this theory do contemplate changes to weather patterns on a world wide basis. It should be noted that eight of the last ten years have been warmest ever recorded in Britain, although 2007 was an exception in that it was a much cooler and wetter year than average, with a subsequent severe decline in the numbers of insects seen. 2008 proved to be very little better in terms of weather conditions. There was considerably more precipitation than average throughout the year and the temperatures were well below normal. Even when there was no rainfall during the summer months, days with any length of sunshine were few and far between.

Two consecutive years of heavy rainfall and low temperatures have taken a considerable toll of the number of local insect species and the numbers of each species seen. The last time there were two consecutive years of similar weather conditions were in the years 1871-2. Then several resident breeding butterfly species were actually lost completely to the North-east of England.

The Butterfly species lost were: - **The Silver-washed** and **Marsh Fritillaries**, **Wall Brown, Gatekeeper, Speckled Wood, Holly Blue, Orange Tip, Ringlet, Comma** and **Peacock**.

Some of the species that were lost gradually reappeared after a period of some 80 years and others gradually followed, other missing species (the two Fritillaries) are unlikely to regain the lost ground as both have become increasingly rarer nationally during the 20th Century.

General Observations.

After the appalling wet weather conditions of 2007 one could perhaps, be excused in hoping that 2008 would be a more clement and productive year, sadly this was not so, we were deprived of even the benefit of a warm spring. This resulted in several hibernating species emerging from their diapause two to four weeks later than usual, with a subsequent delay in their progeny appearing later in the season. The emergence of adult insects is often timed to coincide with the flowering of certain plant species that these butterflies rely on as a nectar source. This was particularly noticeable in the large colourful Vanessid butterflies such as **The Small Tortoiseshell, Peacock,** and **Comma**, also the migrant species such as **Red Admiral** and **Painted Lady** who usually infest Buddlia bushes or Thistle flowers in late summer. By the time these butterflies emerged the main flowering period of these plants was over.

Spring butterflies especially those like the **Orange Tip** and **Green Hairstreak** which are single brooded were only seen in very small numbers. Other species that have two or more broods a year (**Small Copper, Large, Small** and **Green-veined Whites** and **Small Heath**, showed a slight sign of their numbers recovering by the end of this year.

Damselflies and Dragonflies, again, especially those with an annual life cycle also suffered. The rainfall during 2007 had crippled and injured many emerging adults making it impossible for them to produce any progeny and thus there were only small numbers of any species seen during 2008.

Whilst not specifically the subject of this report, it is worth noting that Bumblebees also suffered severely in that the emerging post hibernation queens were of a very small size due to the lack of sufficient nectar and pollen being available in the late summer and autumn of 2007 when the larvae of these queens were being reared. The small size of the Queens meant that the early workers were also tiny, and whilst there was a gradual increase in size of the workers during the year the Queens produced this year were still considerably smaller than would be expected. Given that Apiarists are having considerable problems with their Honeybee colonies with Varroa mite and Colony Collapse Disorder, Bumblebees are vital if many fruit crops, and indeed both cultivated and wild flowers are to be pollinated. Bumblebees themselves have been in decline for many decades and one third of the species that occurred locally in the 1860's are now abscent. Of these only six species are commonly found throughout Northumberland and Durham. Other species of Bumblebee do occur in these counties, but these are restricted in range in some instances by having a specialised habitat. It's a sobering thought that if both domestic and wild bees disappeared, then so would most of the other insect life that relies on the presence of flowering plants as food. The only butterfly and moth species likely to survive eventually would be whose larvae fed on grasses and certain trees that are all wind pollinated.

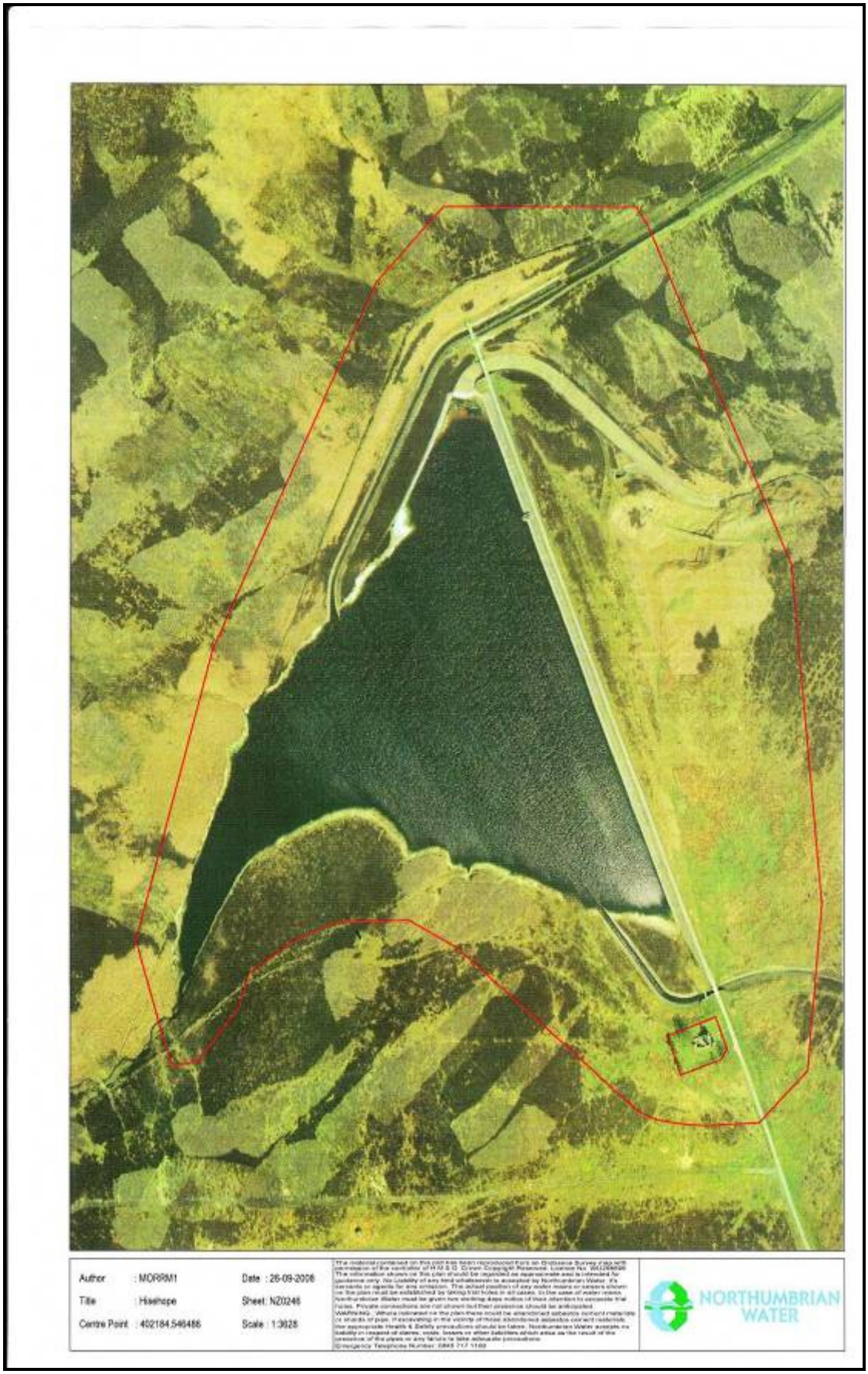
Insect Migration 2008.

Insect migration into Britain is dependant on a number of factors, some species migrate freely, others only when pressures of a large population force them to expand outwards from their usual breeding grounds. Most, but not all of the Butterflies that migrate into Britain, come from southern Europe where temperatures are often considerably higher than here in Britain. Frequently such migratory insects will simply move northwards towards the Scandinavian countries but eventually are forced by cooler conditions to turn westward. Other species will willingly cross the English Channel.

Migratory insects have been noted making landfall from Lands End, all along the south coast and then northwards up the east coast of England and Scotland. Not all the migrant species are 'foreign' to these shores, I have noted in past years, several common British species such as Small Tortoiseshell, Peacock, Large Whites etc., making landfall on the Northumberland coast in some numbers. Migrating insects of many species have been recorded from gas and oil rigs in the North Sea.

Very few migratory insect specimens were reported from anywhere in Britain during 2008. The BBC Radio 4 Programme 'World on the Move' encouraged listeners to report common migrants like the Painted Lady and Hummingbird Hawkmoth. Whilst some reports were made, it was only of single specimens from here and there. It was only in the autumn that a few dozen specimens of **Red Admiral** Butterflies were reported from the North-east of England. **Painted Lady** Butterflies which people have become used to seeing in great numbers for the last decade or so, were markedly abscent, with only a single worn straggler being seen by me this year, at Lamesley Reedbeds & S.T.W

The aerial photographs shown in this report are oriented so that North is at the top of the page. Two of these pictures however have had to be shown in 'portrait' rather than 'landscape' format. In these two instances, North is at the top of the page when the picture is rotated so that the title and other printed wording can be read.



Hisehope Reservoir.

Hisehope Reservoir. NZ 021 464

This small reservoir was first surveyed by me in 2003. As with all reservoirs the fluctuation of water levels has a severe effect of any attempts by Dragonflies to breed due to the inability of aquatic vegetation to establish itself. No Dragonflies were recorded on this reservoir during 2003, but on the 1.5km., long outlet channel leading from the southern edge of this reservoir to Smiddy Shaw Reservoir six resident and one visiting dragonfly species were found. These survived because of the many pools of water present along this channel.

On the northern side of the reservoir there is a stone lined inlet channel which originates some distance away from a series of small streams and a borehole; this supplies additional water above that provided by the Hisehope Burn which feeds into the western end of the reservoir. There was a small but steady flow of water along this channel for the whole length of the current survey period. Both the northern inlet and the southern outlet channels have various species of aquatic plants growing along their length and these provide the breeding habit the Dragonflies recorded here. In the event of the reservoir becoming overfull, there is a spillway on the northern corner of the dam which channels surplus water into the Hisehope Burn. This spillway is steep and no water is retained in the form of pools.

Southern outlet channel leading to Smiddy Shaw.

Northern inlet channel.

It can be seen from the two photographs that both channels contain ample aquatic vegetation which is ideal Dragonfly habitat. Being below the level of the surrounding land a certain amount of protection is afforded from the elements.

Dragonflies.

In 2003 I recorded the following Dragonflies on this site. With the exception of the **Golden-ringed Dragonfly** all were still present, albeit in fairly small numbers. The latter named Dragonfly is a moorland stream dweller in its nymphal form and it is considered unlikely but not impossible, that it bred on this site. However, until there is some evidence of it breeding it should be looked upon as merely a visitor. No exuvia (cast nymphal skin) were found on the vegetation on the channel edges.

Common Blue Damselfly.
Emerald Damselfly.
Blue-tailed Damselfly.
Large Red Damselfly.
Common Darter.
Common Hawker.
Black Darter.
Golden-ringed Dragonfly. (Not seen here this season).

With the exception of the last named, all the other species were recorded, but they were in very small numbers indeed. Even at the best of times, small streams such as these do not produce large numbers of specimens

Butterflies.

In 2003 the following butterflies were recorded at Hisehope
Large White.
Small White.
Green-veined White.
Small Copper.
Meadow Brown.
Small Heath.
Small Tortoiseshell.
Red Admiral.
Painted Lady.

Of these, **The Large White, Small White, Red Admiral** and **Painted lady** should be looked on as either migratory species or casual visitors as their food plants do not grow in the vicinity. **None of these four were seen to be present on this site in 2008.**

One additional species was noted. Several specimens of **The Peacock** were seen, as a Nettle feeder in its larval stage it would have no difficulty in breeding in the near vicinity. The variety of larval food plants is rather limited on the acid moorland that surrounds this site, and this in turn limits the butterfly species that can occur. Of the resident species two are grass feeders; two are on Nettle, one on Sorrel and one on any member of the Cabbage family. A large patch of Bilberry on the southern edge of the reservoir near the dam was examined in the hope of finding **The Green Hairstreak** but no evidence of this butterflies presence was found.

The Butterflies recorded on this site during 2008 are:-

Green-veined White.
Small Copper.
Meadow Brown.
Small Heath.
Small Tortoiseshell.
Peacock.

Single brooded butterflies such as the **Small Tortoiseshell, Peacock** and **Meadow Brown** were present in very small numbers but other butterfly species i.e. **Small Copper, Small Heath** and **Green-veined White** faired rather better as they can have between three and five broods a year if the weather permits, most of this latter group managed three broods and so boosted their numbers.

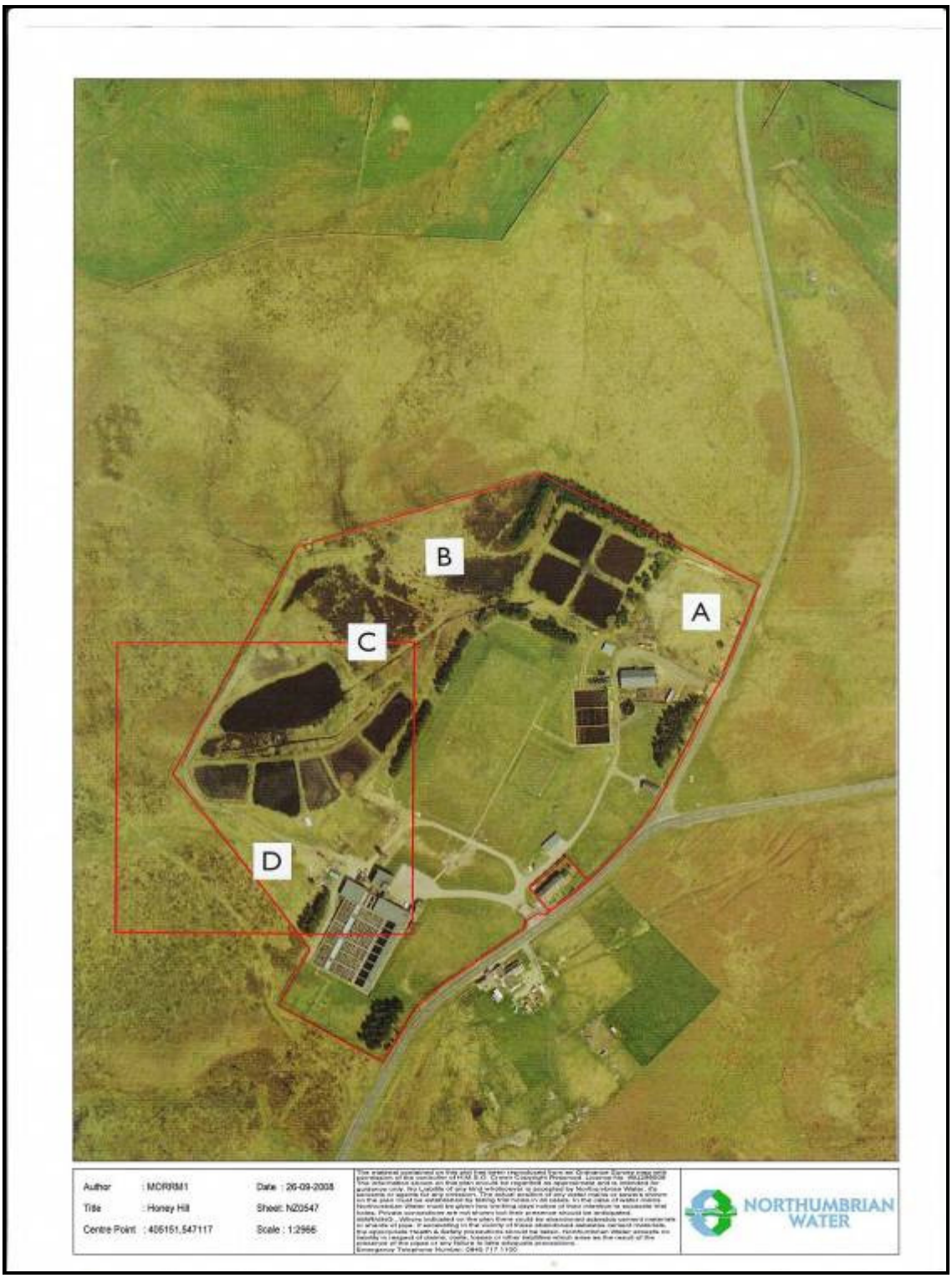
The valley of the Hisehope Burn was carved out of the landscape during the last ice age and glacial erratics are to be found all along the valley lying on top of, or partially embedded in, glacial clays. The soils are just very thin peat seldom more than an inch or two deep. The vegetation is quite limited as to the number of species present and consists mainly of Heather, Rush, Fine Grasses, Bilberry and Sorrels. Occasional patches of Stinging Nettle are to be found particularly where there has been human habitation. In recent years Bracken has started to increase its coverage, but at present this is limited mainly to the land on the northern side of the reservoir. The area surrounding the reservoir is managed for game bird shooting and periodic strip burning of heather takes place so as to provide young Heather shoots for Grouse chicks. This burning frequently destroys all the vegetation beneath the Heather and can decimate small colonies of butterfly species. Such burning takes place in late autumn, winter and early spring when the larvae of butterflies are hibernating at the foot of their foodplants. They have no chance at all of survival if they are present in the area of Heather being burnt. All moorland Moth species are similarly affected.

Sheep graze the surrounds of the reservoir and there was also a large flock of wild geese present during the survey period, sometimes over forty plus that also grazed on the fine grasses present.

Conservation suggestions.

The area of land surrounding the reservoir that is owned by Northumbrian Water is very small indeed and I cannot see any project that would be of benefit to either the Dragonflies or Butterflies that could be carried out in this type of habitat.

The presence of the Dragonflies both small and large in the inlet and outlet channels relies on there being aquatic plants present, both sub-surface and emergent to provide a suitable habitat to enable them to survive. Any cleaning up of the channels would be detrimental, and would certainly lead to the loss of these insects. The channels are of considerable width and depth and the water levels seen in them this year were quite low. The vegetation present would not be of any hindrance should any large volume of water flow be required. In all likelihood a high rate of flow would simply scour the plants from the muddy base in which they grow.



Honey Hill W.T.W.

Honeyhill WTW. NZ 051 470

This Water Treatment Works has been surveyed previously by me, in 2003 and 2005. Of all the Northumbrian Water sites I have surveyed, it is a particular favourite of mine because of the variation of habitat within the site area. Situated on the eastern edge of Muggleswick Common, it is in a transitional zone between Acid Heather moorland and semi improved acid grassland.

The soils within the site have been disturbed many times over the past decades as building work and settling pond excavations have been carried out. A total of ten settling ponds are present, six of these are of considerable age whilst the smaller group of four are of more recent construction. In past visits to this site the old ponds were apparently out of service and most were dried out. This year nine of the settling ponds were in use.

On the aerial photograph area 'A' is a rough piece of clayey ground with very little topsoil. This provides an ideal habitat for Bird's-foot Trefoil which grows here in considerable abundance. This is a food plant for several butterfly and moth larvae, and it is also a popular nectaring plant for the adult butterflies whose larvae eat the leaves. Also present here nearer the public road are other rough ground inhabitants i.e., various Grasses, Stinging Nettle, Sorrels, Willowherb and Thistle. This particular area is rich in butterfly species compared to other moorland property owned by Northumbrian Water in this area. In 2003 **The Dingy Skipper** was found here in small numbers. Unfortunately, it has not been reported here since. A special effort was made to try and find it this year with several additional visits over and above the contracted monthly visit. I see no reason why it should be lost here; there is an abundance of larval food and adult nectar plants. Sadly this butterfly is declining in the North-east for reasons which are not perhaps always apparent.

Area 'B' is Calluna moorland which has been invaded by Raspberry which grows in dense thickets and which provides an abundance of nectar for Bumblebees, amongst which was the **Bilberry Bumblebee** *Bombus monticola*. This is a local, montain species which underwent a very serious population crash over most of Britain in the mid 1990's and which is now just starting to recover lost ground.

Area 'C' is Calluna dominated acid grassland with patches of Bilberry. A small colony of **The Green Hairstreak** is currently occupying an increasingly fragmented patch of Bilberry which is being broken up by the intrusion of both Willowherb and Raspberry. This butterfly species is confined to the Bilberry beneath some power cables which run just outside the narrow band of Pines. Fortunately there are other larger patches of Bilberry less than 30 yards away onto which the insect will move when it's current habitat becomes unsuitable.

Area 'D' was until recently, very much like area 'A' in that it was rough wasteland, as with area 'A', similar plant species were to be found including an abundance of Bird's-foot Trefoil. Much of this area has now been 'improved' and a good number of young trees have been planted here. Fortunately there is a vehicle worn track running from the Main buildings area skirting area 'D' and passing close to the site boundary fence for some 200 yards. This track is covered with clumps of Bird's-foot Trefoil.

The rest of the vegetation is kept neatly manicured by regular mowing throughout the year.

Nine out of the ten settling ponds were in use during the year, the tenth pool being out of service and dry. Of the old ponds only the largest was comparatively free of suspended sediment.

Dragonflies.

Blue-tailed Damselfly.
Emerald Damselfly.

Despite a very careful search only a few specimens of the above two species were found. I consider it certain that no dragonfly species emerged from the four new settling ponds. Those specimens seen were scattered widely over the old settling ponds area.

A visiting specimen of **The Southern Hawker Dragonfly** was seen to fly into the site and make a circuit or two around the new settling ponds. It landed and I photographed it, after which it flew off away from the site. This species likes very clean water in which to breed and it is considered highly unlikely that it would have attempted to breed here. It is known to breed in a small pond at the side of the road leading down to Waskerley Reservoir and also on a feeder stream which leads into the northern side of the reservoir adjacent to the dam.

Butterflies.

In 2003 on the initial survey of this site I recorded a total of thirteen butterfly species including none resident 'casual' visitors. Since then it would appear that the **Dingy Skipper Butterfly** may be lost here, it was not found either in 2005 when a specific search was made for it on this site, or was it found this season. When colony numbers fall to a minimum, it may be almost impossible to detect this species. As with some other species, it has to be a case of being in the right place, at the right time, looking in the right direction, in the right weather conditions for insect flight to have a chance of seeing it at all. Despite the very poor weather conditions this year I managed to add an additional five butterfly species were found. None of these are of particular note and some are simply expanding their range into this area. Perhaps the most interesting is **The Wall Brown** which is becoming exceedingly scarce in mid and southern England. Until now this species has been more or less confined to the coastal areas of Northumberland and Durham and in low lying valleys. I have never seen or heard of it being found on moorland edge habitat before. A total of six specimens were seen.

The species recorded this year are:-

Large White.	**Small White.**
Green-veined White.	**Orange Tip.**
Meadow Brown.	**Small Heath.**
Wall Brown. *	**Ringlet. ***
Small Tortoiseshell.	**Peacock.**
Red Admiral.	**Comma. ***
Large Skipper. *	**Small Skipper. ***
Small Copper.	**Green Hairstreak.**
Common Blue.	

Those species 'starred' are new species recorded from this site.

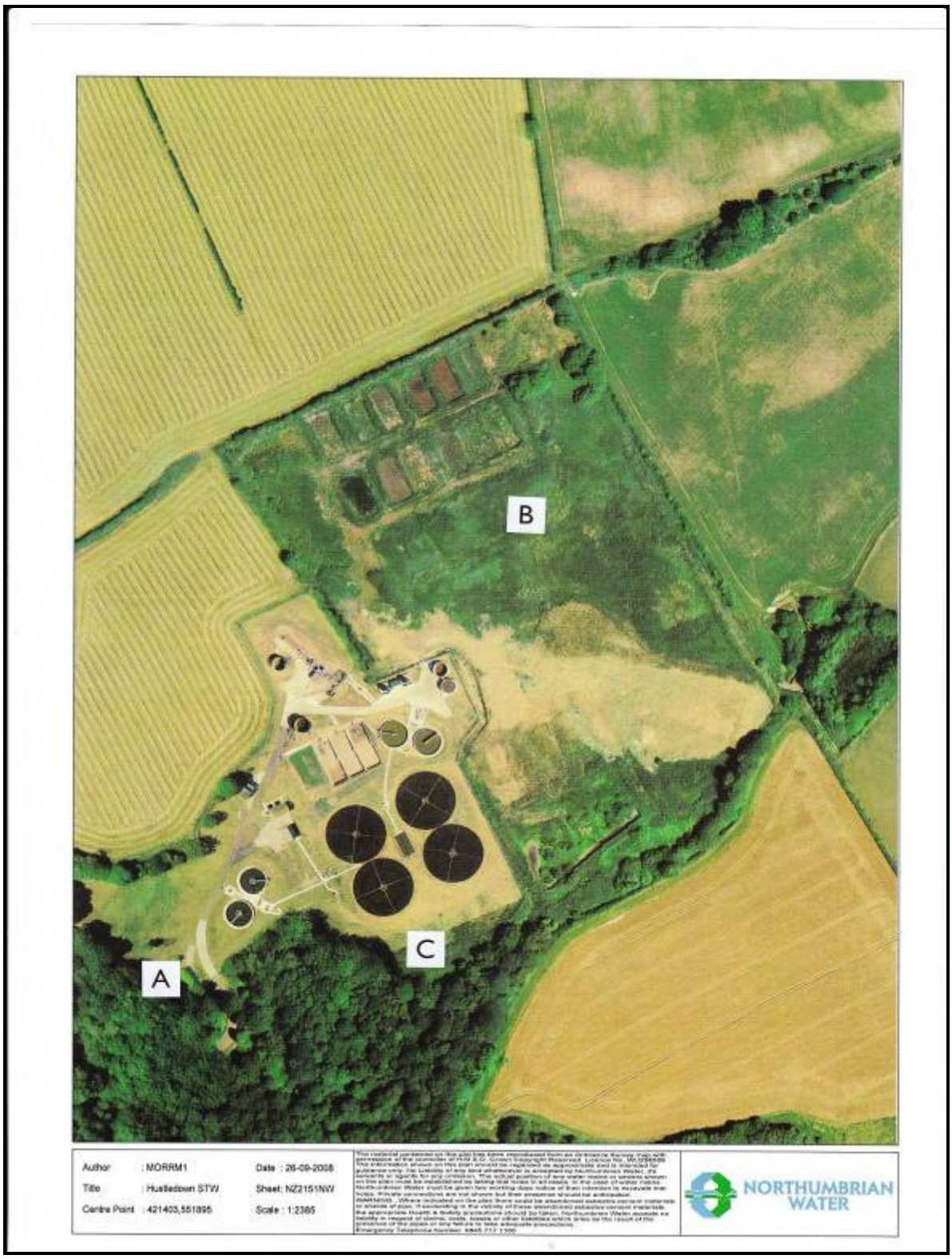
The Painted Lady Butterfly recorded here previously is a migratory species which failed to appear this year in this part of Britain. In most years in the last decade it has been an abundant species. Both the **Comma** and **Red Admiral** were observed ovipositing on Stinging Nettle in area A. Elm is the usual food plant for the **Comma** but it will commonly utilise Nettle in the absence of Elm.

If I recall correctly, only the Portrack STW and Marsh have a larger butterfly population in terms of species numbers.

Conservation.

Unless one of the old settling ponds can be taken out of service and converted into a Dragonfly Pond there will never be a stable dragonfly population here. Trying to save the current Green Hairstreak breeding patch of Bilberry is not worth the effort or expense, to remove the Raspberry and Willowherb by pulling would destroy the Bilberry. Both the invasive plants have long underground runners. Pulling either would simply uproot the Bilberry.

It is suggested that area A is left as it is with as little disturbance as is possible in future. Trying to 'improve' it will almost certainly cause the loss of some of the species present.



Hustledown S.T.W.

Hustledown STW. NZ 213 518

Situated on the north-east corner of Stanley Wood Nature Reserve, the site inside the metal perimeter fence is well manicured by regular mowing apart from a narrow 2 foot band immediately inside the boundary fence.

On entering the site through the main gate on the left hand side there is an area of land marked 'A' on the aerial photograph, is some 30 yards square bounded on two sides by the high metal fence and on the other two sides by Privet that has been allowed to grow unchecked. It would appear that this area was possibly the site of an old gatehouse now long demolished, the Privet being the original garden hedge. This small area proved to be the most interesting part of the site within the current site boundary, in that it was the only place where certain butterfly species had suitable breeding habitat.

To the North-east of the site (outside on the current boundary fence) are the old sludge lagoons. These appear to have been out of service for many years and have become overgrown with coarse grasses and Stinging Nettle an occasional Willow shrub is present. The lagoons are heavily fenced off. No water is now present in any of the old sludge lagoons. Elsewhere this part of the site is dominated by grasses, White dead Nettle, Stinging Nettle, Cleavers and Sorrel. A small area adjacent to the access gate to the sludge lagoons is churned up and some stone ballast is present this area has the appearance of a Brownfield site with rubble stones, bricks etc. Here Plantain is the dominant species with a few short fine grasses and Daisies present. Only a very small amount of Jack by the Hedge is to be found around the bases of the hedges, odd patches of Sallow/Willow are present. The land is difficult in places to traverse; there are occasional ditches, well hidden by tall vegetation, to trip the unwary.

On the southern edge of the modern site, is Area 'C', this is a band of vegetation (mainly Stinging Nettle) some 30 feet deep immediately to the north of Stanley Wood. This grows to almost head height and is virtually impassable. I presume that it remains unmown because of unevenness of the ground.

The unmown area C inside the site boundary fence.

Stanley Wood to the South of the site is a piece of ancient woodland dominated by Oak and Birch with occasional Beech, Hawthorn and Sallow. Around the old site boundary (area 'B') are very old hedges typically Hawthorne, with the occasional Elderberry and wild Rose.

Access around the lagoons site is difficult as there are no footpaths present and the vegetation does grow to height that makes access in places quite impossible.

There is no open water anywhere on the site, therefore Dragonflies were not expected to be seen and as it turned out, none were seen. The site does have some potential for butterflies.

Butterflies recorded.

Small Tortoiseshell.
Peacock.
Red Admiral. 1 late in the season.
Orange Tip. (1).
Large White.
Small White.
Green-veined White.
Small Copper. *
Common Blue. (3)
Large Skipper.*
Small Skipper.*
Meadow Brown.*
Small Heath.*
Wall Brown.* (2 only).
Purple Hairstreak. Scarce on the Southern boundary, and only on Oaks outside the boundary fence. One specimen was seen nectaring on the Privet blossom just inside the main entrance gate in area 'A'.

The * indicates species found in area 'A'. Some were also found elsewhere in area 'B' but the **Wall Brown, Small** and **Large Skippers** were not seen elsewhere on any part of the site. **The Purple Hairstreak** should be regarded as just a casual visitor. Oak trees within the site boundary were checked for the presence of this small butterfly but it was not located.

Conservation.

The only place of entomological interest within the modern fenced part of this works is the small area immediately inside the main gate, labelled 'A' on the aerial photograph of the site. It is suggested that this be simply left alone. It would appear that nothing has been done to this small area in the way of maintenance for many years, and has evolved naturally into a small grassland that supports no less than three butterfly species that were not found anywhere else on either the old or new parts of this S.T.W.

There is ample scope for some conservation measures to be taken on the old part of this site, area 'B'. The land here slopes slightly downward from North to South; there are no streams or water courses present although there is a deep ditch skirting the eastern edge of the metal fenced part of the site which appears to be a catchment ditch in case of a spillage or rupture of and of the steel sewage storage tanks.

It should be possible for a fairly large but shallow pond specifically for Dragonflies to be constructed in this area of wasteland, but such a pond would need very careful sighting. It should be low enough so that it fills naturally with surface water running off the higher land. Consideration would also have to be given to what else has occupied the now derelict land of area 'B'. It may well be that in times past there were buildings or chemical storage facilities here and traces of these may still be present. Old Ordnance Survey Maps of this area may offer some clues as to what was constructed here years ago.

Pond construction, even that of a large pond isn't a very inexpensive project, but due consideration to the financial aspect of such a venture would have to be given. It may well be that in the current time of recession; such an idea may have to be pigeon-holed until better times. There is certainly plenty of available space for such a pond.

Lamesley Reedbeds & S.T.W.

Lamesley Reedbeds & S.T.W. NZ 258 565

When first surveyed by me in 2006 the Reedbeds were of fairly recent construction and the planting up of the various Reed, Typha and other and aquatic plants had not been totally successful in that there were areas of most lagoons where the planting had failed and open areas of water. Some of these open patches of water were very large indeed and this had attracted, in a very short time, several Dragonfly species which had become resident breeding species. The lagoons also attracted two rare migrant Dragonfly species which can only be classed as casual visitors, neither species being capable of breeding in Britain this far north.

In the two years since the last survey the area of vegetation in each lagoon has increased considerably with a subsequent decrease in open water. This, together with the poor weather over the last two years has also led to a decrease in the number of Dragonfly species present, and also the numbers of each species seen.

The aerial photograph shows some large areas of open water, these are now much smaller, especially on the western four lagoons. The pathways and tracks around the lagoons are very closely mown and no butterflies were found to be breeding on these grass tracks. The bottoms of the ditches which run along the length of the lagoon boundaries are, in places, inaccessible to the mowers and here butterflies can breed, in particular the **Orange Tip** and **Ringlet**.

There is little in the way of butterfly habitat on the lagoon surrounds, there are a few patches of Bird's-foot Trefoil on which **Common Blue** and a single **Dingy Skipper** were found in 2006. The plant and the **Common Blue** Butterfly are still present but the **Dingy Skipper** was not seen this year. The rather stunted Oak's on the site's southern boundary produced **Purple Hairstreak** Butterflies during both the 2006 and this year's survey.

The 2006 Survey only encompassed the Lagoon area. This current survey was extended to take in two very large Brownfield sites marked 'A' and 'B' on the site photograph.

Area 'A' is quite sparsely vegetated centrally, although the edges of this site are well covered with a variety of flowering plants and grasses. These field edges are good butterfly habitat and several species are breeding here. There is a large amount of builder's rubble protruding from the clay/soil which may indicate prior occupation of the site by buildings. The land is certainly not recently used farmland. During periods of rainfall surface ponds appeared due to the very poor natural drainage, these lasted for several weeks before finally disappearing.

Flowers in hedgerow margin area 'A'.

General view of field area 'A'.

Area 'B' an 'L' shaped piece of land is also what may be classed as Brownfield. Soils and other materials from around the site have been bulldozed or dumped here and have over the years become overgrown in places with coarse weeds i.e. Thistle, Ragwort, Willowherb, Stinging Nettle, Dock and Clovers, etc. Elsewhere where soils are thinner or of a predominantly clay makeup have stunted plants of low growth. The hedgerow margin between area 'B' and separating it from the Reed Beds is

overgrown with Stinging Nettle and Blackberry. Two nests of **Small Tortoiseshell** and one nest of **Peacock** larvae were found here.

Areas 'A' and 'B' were richer is what butterfly species were present on this site simply because of the greater variety of plants available to them for both nectaring and ovipositing. It is simply a case of this area being better quality habitat, than the heavily mown land around the Reed Beds. More butterfly species were present here than elsewhere on the site.

Teneral dragonflies, which move away from their breeding sites in order to become mature were seen in Area 'A' in small numbers from May until October especially over the gravel track on the north edge of this area, almost certainly basking in what heat was reflected from the gravel chippings. Even site staff noticed and commented on them. Some of the taller weeds along this gravel track had been sprayed with weed killer.

Dragonflies recorded in 2006.

Large Red Damselfly.
Blue-tailed Damselfly.
Common Blue Damselfly.
Emerald Damselfly.
Azure Damselfly.
Common Darter.
Ruddy Darter.
Southern Hawker.
Migrant Hawker.
Emperor Dragonfly.
Yellow-winged Darter.
Red-veined Darter.

Dragonflies recorded in 2008.

Large Red Damselfly.
Blue-tailed Damselfly.
Common Blue Damselfly.
Emerald Damselfly.
Azure Damselfly.
Common Darter.
Ruddy Darter.
Southern Hawker.
Migrant Hawker.

All dragonfly species were less common here this year than in 2006. No specimens of **Emperor Dragonfly** were seen here this year although I did see them elsewhere. **The Yellow-winged and Red-veined Darter** being scarce migrants were not expected to be found.

Butterflies recorded in 2006.

Green-veined White.
Orange Tip.
Large White.
Small White.
Red Admiral.
Small Tortoiseshell.
Peacock.
Comma.
Painted Lady.
Meadow Brown.
Small Heath.
Wall Brown.
Ringlet.
Small Copper.
Small Skipper.
Large Skipper.
Dingy Skipper.
Common Blue.
Purple Hairstreak.

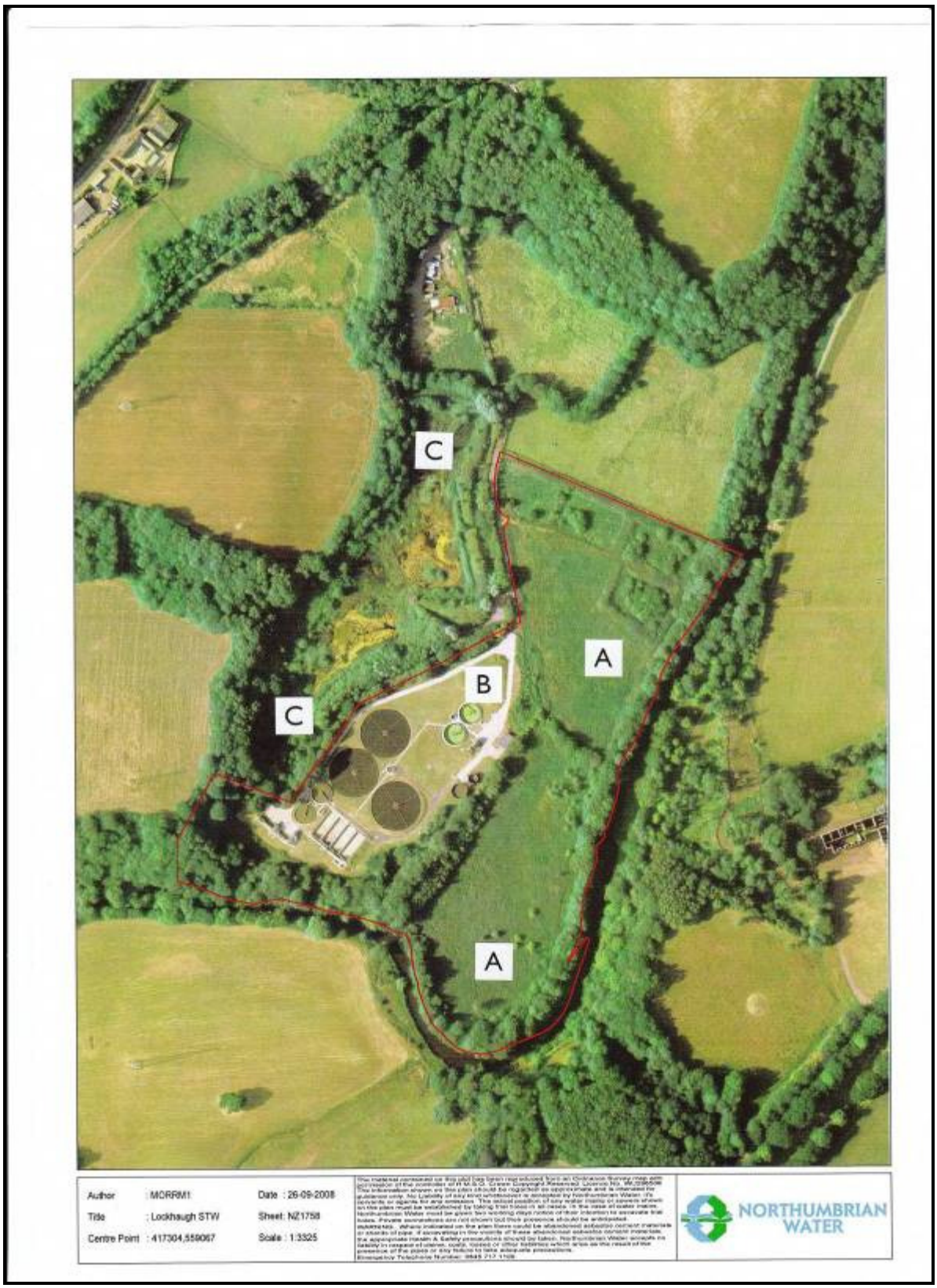
Butterflies recorded in 2008.

Green-veined White.
Orange Tip.
Large White.
Small White.
Red Admiral. A few in the Autumn
Small Tortoiseshell.
Peacock.
Comma.
Painted Lady. One specimen seen this year.
Meadow Brown.
Small Heath.
Wall Brown.
Ringlet.
Small Copper.
Small Skipper.
Large Skipper.
Dingy Skipper. Not found this year.
Common Blue.
Purple Hairstreak.

The lower numbers of specimens of each species seen this year was, in my opinion, due entirely to the poor weather encountered during 2007 and 2008. I would consider it likely that **The Dingy Skipper** seen in 2006 was a stray from a covered over landfill site to the south of Lamesley S.T.W. There is only a little Bird's-foot Trefoil present on the Lamesley site.

Conservation.

As the Reedbeds become fully vegetated and the open areas of water disappear, the numbers of dragonfly species will drop with only one or two Damselfly species being capable of breeding in the shallow edges of the lagoons. If there are no immediate future plans for the wasteland areas 'A' and 'B' it would be beneficial for dragonflies to construct a pond here. The land in both areas has a very high percentage of clay in its makeup so constructing a pond should not be a great problem, more a matter of finance more than anything else. Sowing seed of Bird's-foot Trefoil on parts of either area 'A' or 'B' would increase the chances of **Dingy Skipper** colonising the site and also increase the numbers of **Common Blue**. Only a few plants of this species are present. Once established it should proliferate rapidly.



Lockhaugh S.T.W.

Lockhaugh S.T.W. NZ 173 589

This site has not been surveyed previously for its insect populations. The modern part of this S.T.W is one of the smallest in the North-east area, and only occupies one third of the actual land area owned by Northumbrian Water. Within the fenced area of the S.T.W. the great majority of the grassland is regularly mown and does not constitute good Butterfly or Dragonfly habitat, except in one small area.

This is immediately inside the site entrance where the access road splits. Shown on the aerial photograph beside the letter 'B'. In the hollow of the 'Y' shaped angle there is an area of land which has been raised to some five feet above the surrounding land. This was apparently formed by the dumping of soil in this area when work was being carried out elsewhere within the site. Indeed it was being added to, by fresh earth excavated here this year. Not being mown, a good number of flowering plants have been come established here. These include; Red and White Clovers, Bird's-foot Trefoil, Scabious, Thistle, Teasel, Hardhead etc, all species which are attractive as either larval food plant or adult nectar plants, and provide flowers of some sort throughout most of the year.

Outside of the metal fenced site, there are two areas, each as large as the currently occupied and operational STW which are labelled 'A' and 'A'. These are areas where old settling ponds, (now out of service), exist. From the aerial photograph, it appears that the old settling ponds are only present in the northern part of these areas, but I was assured by the Site Manager, that this was not so, and that both areas labelled 'A' were in fact, places where old sludge lagoons existed. The northern part of section 'A' holds four Settling Ponds which are within raised 'Bunds'. These, like the immediate surroundings are overgrown with vegetation, mainly grasses with the occasional Sallow bushes, which have been permitted to grow in an uncontrolled manner. In early spring in the northern part of section 'A' pieces of metallic pipe work are visible, but as the year progresses these become hidden by the growth of vegetation. The vegetation over both areas marked as 'A' on the aerial photograph is predominantly Common Stinging Nettle, with patches of Bramble, Heraclium, Sallow and Willowherb. These grow to heights of five to six feet, making access very difficult.

As the season progressed, the vegetation grew higher, until it became at least six feet tall making access very difficult indeed, especially where Stinging Nettle predominated. Insects in general, do not like tall vegetation, and what few butterflies that were seen in area's 'A' were flying over, rather than alighting in this area. The exception was in the location of the strimmed track way, where the surrounding high vegetation provided good shelter from the elements. It was here that the great majority of the Dragonfly records were made. An abundance of small 'Diptera' was to be found along this strimmed track and these were what attracted the dragonflies to this particular area.

For a site with absolutely no Dragonfly breeding habitat within its boundaries, it had what may at first glance appear to be a very good Dragonfly population with more species present on it than many other Northumbrian Water Properties. The reason for such Dragonfly numbers is explained by an examination of the adjoining property known as the Far Pasture Nature Reserve, a part of the Thornley Woodlands NR run by Gateshead Borough Council. The area on the site photograph between the letters C-C is in fact a series of interconnected shallow lakes which is where all but one of the dragonflies seen actually breed. The exception (The Banded Demoiselle) breeds in the River Derwent which bounds the southern and eastern borders of the Lockhaugh STW.

The Dragonflies emerging from the Far Pasture NR leave the immediate vicinity of their breeding habitat to feed and become sexually mature. The old setting ponds and their surrounds provide an ideal maturing site for these insects as there is an abundance of small Diptera present here as well as a very large area of tall vegetation in which they can roost with almost complete safety from any predators.

One of the lakes at the Far Pasture Nature Reserve.

The Dragonflies recorded from within the boundaries of the Lockhaugh S.T.W., are as follows:-

Common Blue Damselfly
Azure Damselfly.
Banded Demoiselle.
Ruddy Darter.
Common Hawker.
Migrant Hawker.
Large Red Damselfly.
Emerald Damselfly.
Common Darter.
Four-spot Chaser.
Southern Hawker.

The Butterflies recorded from within the boundaries of the Lockhaugh S.T.W., are as follows:-

Green-veined White.
Orange Tip.
Large White. Occasional visitor to the site.
Small White. Occasional visitor to the site.
Red Admiral. Occasional specimens of this migrant species present in the late autumn.
Small Tortoiseshell.
Peacock.
Comma.
Meadow Brown.
Small Heath.
Small Copper.
Small Skipper.
Large Skipper.
Common Blue.

Other than where commented upon above, the butterfly species named are resident within the boundaries of the Lockhaugh site.

None of the species recorded from this site are unusual or exceptional, and none, even the most common, were only present in other than small numbers throughout the season.

Conservation.

It is suggested that the current mowing regime inside the fenced operational area is continued as it is presently structured, and that the raised area of land inside the gates be left to continue to grow wild as there is a good mixture of both larval food plants and adult insect nectar plants present.

The two areas A-A occupied by old sludge lagoons etc, have been left unmanaged for many years and are now dominated by vegetation that has the ability to grow to a considerable height and which shades out the low growing plants. Whilst some of these existing plants are known to be Butterfly larval foodplants the, butterflies are not utilising them for breeding purposes, because of the height they have grown too, butterflies like lower and more compact patches of larval foodplant.

The two areas A-A must comprise the largest acreage of Common Stinging Nettle that I have seen in my lifetime anywhere in Britain. It is in all honesty, difficult to come up with a Management Plan for this area. Without detailed plans of where all the old settling ponds are, and what the layout of pipelines present may be, it would be impossible to plough out the area. Grazing by Goats may reduce the amount of Nettle, but it would take a large number of animals to make any impression whatsoever given the vast volume of vegetation, and the site would have to be stock proofed (for Goats) around its perimeter, an expensive item in itself.

Tunstall Reservoir and Nature Reserve.

N.B. Note that the map is apparently incomplete. This is due to the aerial photograph ending on the eastern edge of the site and is not a fault in the reproduction of this picture.

Tunstall Reservoir. NZ 065 412

This reservoir has been surveyed by me, on one previous occasion in 2003. The Reservoir is at present out of service and is utilised solely as a Trout Fishery. Throughout the period of the 2008 Survey this Reservoir was full and there was a small but constant flow of water down the overflow spillway, therefore the water level was very stable throughout the year.

To the south of the dam wall the grassland within the site is regularly mowed from the rear face of the dam wall to the boundaries of the site perimeter. Few butterflies can exist under such a severe mowing regime and little other than the occasional transient butterfly was noted. The Oak Trees immediately inside the site access gate below the dam, did however support a small colony of **Purple Hairstreak Butterfly** and a very few **Common Blue Butterflies** were seen on Bird's-foot Trefoil, just a few yards away from the Oaks.

It is interesting to note that between the Surveys of 2003 and the current 2008 survey that a number of **Clouded Yellow Butterflies** were recorded by local naturalists as having been seen on the grasslands on the rear of the dam wall. This butterfly is a scarce migrant in the North-east of England but during the mid 1990's it did appear in considerable numbers in certain parts of Britain.

This butterfly has several broods per annum and could well have completed its entire life cycle in between the mowing of the grasslands, where its foodplant, Bird's-foot Trefoil grows in some abundance.

To the north of the dam wall the area of land surrounding the reservoir that is owned by Northumbrian Water is very small indeed. On the eastern side of the reservoir from the dam wall to the Nature Reserve, trees overhand and severely shade to ground, to such a degree that virtually no plants grow, there is no suitable Butterfly habitat here.

On the western side of the reservoir there is a narrow strip of land from the dam wall to the Nature reserve which although fairly depauperate in plant species, did have enough present to be of value to breeding butterflies as a place where they could breed.

It has been noted in my previous surveys, that reservoirs in general are very poor, as sites where Dragonflies may breed, due to their fluctuating water levels and the lack of shallow waters where pondweeds may take root and provide a reasonable Dragonfly habitat. Although the water levels here have been stable for some time, pond weed was only noted in one place, approximately half way up the reservoir where an un-named stream enters the reservoir from the west. This small bay beside the car park where this stream enters the reservoir looks to be good Dragonfly territory, but despite many hours surveying this site not one single Dragonfly was seen.

My initial survey in 2003 recorded no Dragonflies as being present, and there was no change to the situation during 2008.

At the northern end of the reservoir is a small area of reservoir surrounded by grassland, a feeder stream enters the reservoir here. During this year a large flock of wild Geese had taken up residence here, and the grassland had been eaten down to almost soil level by these birds. No Dragonflies or Butterflies were noted in the Nature Reserve section during any visit.

The narrow margins of the western side of the reservoir between the waters edge and the roadway although narrow in width, did produce a surprising number of Butterfly species. Some of these were simply transient in their occurrence as their foodplant does not occur within the boundary of this reservoir. Migrant species were noticeable by their absence this season.

In 2003 and 2008 I recorded the following butterfly species as being present here.

Butterflies recorded in 2003.
Large White.
Small White.
Green-veined White.
Orange Tip.
Small Copper.
Common Blue.
Small Heath.
Red Admiral.
Small Tortoiseshell.
Painted Lady.
Meadow Brown.
Small Heath.
Small Skipper.
Ringlet.

Butterflies recorded in 2008.
Large White.
Small White.
Green-veined White.
Orange Tip.
Small Copper.
Common Blue.
Small Heath.
Small Tortoiseshell.
Meadow Brown.
Ringlet.
Small Heath.
Small Skipper.
Purple Hairstreak.

In 2008 all the species recorded in 2003 were present with the exceptions of **Red Admiral**, and **Painted Lady**, both of which are migratory species, and **The Purple Hairstreak** which is newly recorded here.

The Large and **Small Whites** should be considered as transient visitors as their foodplants were not noted within the Reservoir Boundary. As far as numbers are concerned, **The Ringlet**, was perhaps the most numerous, which is not at all surprising as it favours damp situations. As elsewhere the numbers of Butterflies were considerably reduced in numbers.

Conservation.

I have no recommendations to make in respect of this site.

Waskerley Reservoir.

Waskerley Reservoir. NZ 023 442

Last surveyed for Dragonflies and Butterflies in 2003, there has been little change since. The water level in this reservoir fluctuates rapidly and falls of several feet take place in a very short period of time. Such changes preclude Dragonfly Nymphs successfully completing the aquatic part of their life cycle. The lack of aquatic vegetation and the numbers of predators both Avian and Piscean would offer little chance of survival for any nymph that hatched in this water body.

Around the periphery of the reservoir there are several small streams which run off the surrounding valley sides, there is also the Waskerley Beck, the main feeder stream. These streams being on valley sides are steep and therefore water, when present in them, does drain away very rapidly. None of these small streams were considered suitable for occupation by Dragonfly nymphs. The feeder streams and the Waskerley Beck are rough stone and water worn boulder lined with no mud or soils present where aquatic weed could get a foothold.

In addition there is a man made cut stone lined channel (albeit overgrown) feeding water into this reservoir at the northern end of the dam marked 'A' on the map. It was along this stream that the only dragonflies present on this site were seen. The water flow here is slow and various aquatic plants and emergent rushes have established themselves.

This stream flows into the woodland that lines the access road to the dam and then turns south and drains into the reservoir. There is a marked similarity here with the similar cut stone lined channels at Hisehope Reservoir which is nearby. Both have slow moving water flow and have accumulated silts and soils that have allowed the establishment of aquatic vegetation. The overflow spillways did not contain water as they only operate when the water levels exceed the maximum design level. This did not occur to my knowledge during 2008.

The land immediately surrounding this reservoir is much the same as that at Hisehope Reservoir being thin peat over Glacial Clays that are poor in nutrients, thus the plants that can survive here are relatively few. This in turn affects the insect life. The dominant plants are various grasses and Heather with some Sheep Sorrel growing on patches of freshly disturbed earth. Damp ground provides a foothold for Ladies Smock. Unusually Bird's-foot Trefoil a plant that prefers a lime rich soil occurs here, the seeds probably being transported in with stone ballast for road making and building purposes.

The Butterflies that occur here, other than those in transit, can only survive as breeding residents if their larval food plant is present in some abundance. The fewer plant species that are available, the fewer the butterfly species that can occur, hence the small number of Butterfly species that can be classed as breeding residents on this site.
In 2003 and 2008 I recorded the following butterfly species as being present here.

Dragonflies recorded in 2003.

Common Blue Damselfly.
Emerald Damselfly.
Blue-tailed Damselfly.
Large Red Damselfly.
Southern Hawker.
Common Hawker.
Golden-ringed Dragonfly.

Dragonflies recorded in 2008.

Common Blue Damselfly.
Emerald Damselfly.
Blue-tailed Damselfly.
Large Red Damselfly.
Southern Hawker.

The Dragonfly species that were seen were in very small numbers, indeed sometimes no more than just two or three individuals were present. **The Common Hawker** may have been lost here due to territorial battles with **The Southern Hawker**. Such fights were observed here in 2003, and **The Southern Hawker** invariably wins these disputes being the more aggressive of the two. No specimens of **The Golden-ringed Dragonfly** were seen, but this is not a resident species on this site, just a casual visitor.

Butterflies recorded in 2003.

Large White.
Small White.
Green-veined White.
Small Copper.
Meadow Brown.
Small Heath.
Common Blue.
Red Admiral.
Painted Lady.
Small Tortoiseshell.

Butterflies recorded in 2008.

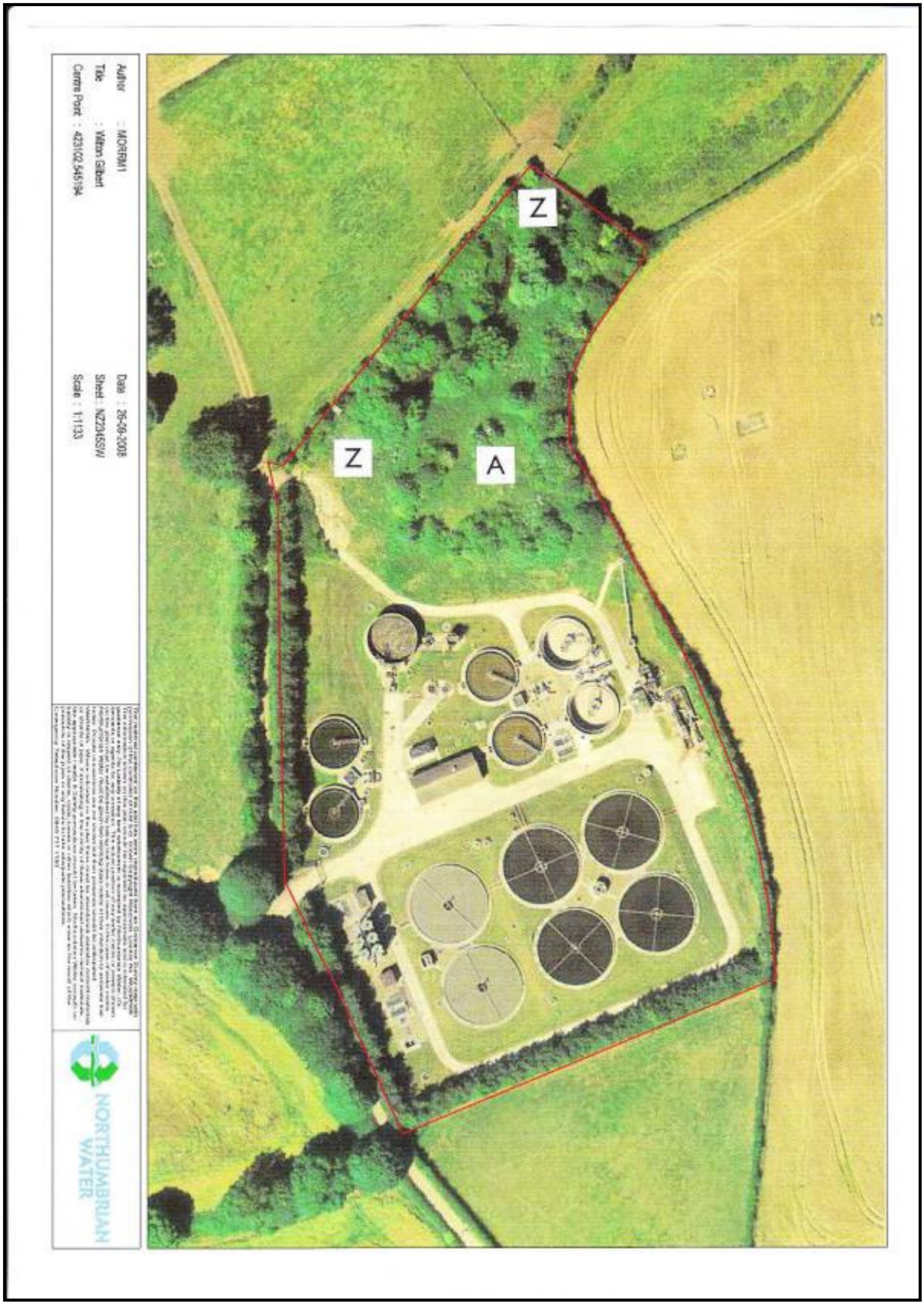
Large White.
Small White.
Green-veined White.
Small Copper.
Meadow Brown.
Small Heath.
Common Blue.
Small Tortoiseshell.

The **Large** and **Small Whites** are casual visitors rather than resident breeding species. The **Red Admiral and Painted Lady** are predominantly migratory species that scarcely seen in northern England this year. The **Small Copper** and **Small Heath** Butterflies faired best as they both managed to produce three broods on this site this season. This enabled them to maintain fairly high numbers.

The **Green-veined White** managed two broods instead of its usual three, but the **Meadow Brown** and **Common Blue** did very poorly, with only one brood per year they were still suffering from the effects of the very wet weather of 2007.

Conservation.

I have no suggestion in relation to this site; there is little that could be done to attract additional species of either insect order given the narrow confines of the landholding.



Witton Gilbert S.T.W.

Witton Gilbert S.T.W. Pond. Grid Ref. NZ230451

The main source on entomological interest at this S.T.W. is, or rather was, the long pond which runs along the line Z-Z on the aerial photograph. First surveyed by me in 2004 this pond was found to have seven resident breeding species, and an additional two visiting species of Dragonfly. In 2004 there was good growth of aquatic plants both submerged and emergent. This is ideal habitat for these insects even though the pond is somewhat heavily shaded.

In the intervening four years the shading has increased as the Willow trees lining the bank sides have grown. The emergent vegetation had died off, as has the submerged pondweed. There was a considerable volume of algae present this year, mainly caught up in the dead and rotting pondweeds. Not one single Dragonfly was seen either near the pond or anywhere else on this site. There also seemed to be a distinct lack of other aquatic wildlife in this pond.

The 2004 survey was purely for Dragonflies and no notes on other insect species were made. The current survey was to include any Butterflies seen. The Witton Gilbert STW site is relatively small in area, and like most other Northumbrian Water sites extensive mowing of vegetation is carried out on a regular basis. Fortunately there is an area adjacent to the pond indicated by the letter 'A' on the photograph of the site which has been left alone. This miniature wilderness is dominated by a variety of common trees and shrubs between which tall herbage is present. This is mainly comprised of Stinging Nettle which grows to heights varying between four and six feet. Whilst this plant is utilised by several butterfly species as a larval food, but it has to be growing in very specific aspects and locations and also be of a certain height, to be at all attractive to the adult insect as a place on which to lay her ova.

Fortunately the margins of this wilderness are occasionally strimmed; the ground is too rough and uneven for a power mower to be used. This has permitted a number of nectar providing and larval food plants to successfully grow. This area proved very popular with the butterflies that were present either as resident breeding or visiting species.

Considering the relatively small area of suitable butterfly habitat on this site it did in fact support more species than I initially expected to find. Three species breed on the periphery of the site as the larval food plants only grow outside the boundary fence, but these species, as adults, visited in order to nectar.

Butterflies recorded. Unless otherwise stated these are resident breeding species on this site.

Large White. A visitor to this site.
Green-veined White.
Small White. A visitor to this site.
Orange Tip. A visitor to this site.
Small Tortoiseshell.
Peacock.
Comma.
Red Admiral. A scarce migrant this year, only one specimen seen on this site, it could breed here.
Meadow Brown.
Small Heath.
Small Skipper.
Small Copper.
Common Blue.
Purple Hairstreak. A visitor to this site, breeding on Oak just outside the site boundary fence.

The boundary fence is edged in places with many Hawthorn and Elderberry shrubs. Whilst both of these species carry prolific volumes of blossom, these are not apparently attractive to butterflies but are very attractive to Bumblebees.

Dragonflies recorded.

None.

It is always disappointing when a Dragonfly breeding site is lost and whilst the number of species recorded here in the past wasn't particularly large, it will take some time before the previously recorded seven species are likely to return. There is a shortage of good Dragonfly sites in the valley of the River Browney.

Conservation suggestions.

The main cause for concern is obviously the loss of the pond as a dragonfly breeding site. It may well be that having a through flow of water, it will clean itself naturally. If the pond is to survive into the future it will be necessary for some selective felling of the trees that line the bank side and overhang the water to be carried out, so as to let a lot more light onto the pond.

Water bodies that exist in areas of deep shade seldom, if ever, prove attractive to insects as a place to breed. The lack of light cuts down on the amount of vegetation growing in the water and this in turn has an effect on many of the very small and medium sized aquatic organisms that use plant life for shelter from predators and for hunting out food for themselves. A well vegetated pond is a healthy pond.

Insect Species mentioned in the text. (including Scientific Names).

Butterflies.

Large White. ***Pieris brassicae.***
Small White. ***Pieris rapae.***
Green-veined White. ***Pieris napi.***
Clouded Yellow. ***Colias croceus.***
Orange Tip. ***Anthocharis cardamines.***
Meadow Brown. ***Maniola jurtina.***
Small Heath. ***Coenonympha pamphilus.***
Wall Brown. ***Lasiommata megera.***
Hedge Brown. (Gatekeeper). ***Pyronia tithonus.***
Ringlet. ***Aphantopus hyperantus.***
Small Tortoiseshell. ***Aglais urticae***
Peacock. ***Inachis io.***
Red Admiral. ***Vanessa atalanta.***
Painted Lady ***Vanessa (Cynthia) cardui.***
Comma. ***Polygonia c-album.***
Dingy Skipper. ***Erynnis tages.***
Large Skipper. ***Ochlodes venata.***
Small Skipper. ***Thymelicus sylvestris.***
Small Copper. ***Lycaena phlaeas.***
Green Hairstreak. ***Callophrys rubi.***
Purple Hairstreak. ***Neozephyrus (Quercusia) quercus.***
Common Blue. ***Polyommatus icarus.***
Holly Blue. ***Celastrina argiolus.***
Silver-washed Fritillary. ***Argynnis paphia.***
Marsh Fritillary. ***Eurodryas aurinia.***

Dragonflies.

Common Blue Damselfly. ***Enallagma cyathigerum.***
Large Red Damselfly. ***Pyrrhosoma nymphula***
Azure Damselfly. ***Coenagrion puella.***
Emerald Damselfly. ***Lestes sponsa.***
Blue-tailed Damselfly. ***Ischnura elegans***
Banded Demoiselle. ***Calopteryx splendens.***
Common Darter. ***Sympetrum striolatum.***
Ruddy Darter. ***Sympetrum sanguineum.***
Yellow-winged Darter. ***Sympetrum flaveolum.***
Red-veined Darter. ***Sympetrum fonscolombii.***
Four-spot Chaser. ***Libellula quadrimaculata.***
Common Hawker. ***Aeshna juncea.***
Southern Hawker. ***Aeshna cyanea.***
Migrant Hawker. ***Aeshna mixta.***
Emperor Dragonfly. ***Anax imperator.***
Golden-ringed Dragonfly. ***Cordulegaster boltonii.***

Acknowledgements.

The author would like to express his thanks to the Site Managers and the staff on each of the Northumbrian Water sites visited during the 2008 Insect Survey, for their assistance in accessing the various sites. Several showed a keen interest in what species occurred in the areas where they worked and yet others pointed out places where they had observed various insects themselves.

As always, thanks are due to Mr. Stuart Pudney of Northumbrian Water Conservation Department for commissioning this survey and to Mr. Mark Morris, of the same office for his enthusiasm and assistance in supplying the aerial Photographs of the various sites visited, contact information etc.

Appreciation is also extended to Mr. Steve Franks for the use of his photograph of a Migrant Hawker *A.mixta* shown on the front cover.
