

PINS RECEIVED

03 MAY 2012

11:25

IPC Examination of Heysham M6 Link  
Local Safety Impact  
Presented by John Wilding : Unique Ref.no. HEY  
Member of the Halton Residents' Group Unique Ref. no.

Four properties with families with five young children use the courtyard leading to the Boat House, the exit and entrance of which is situated opposite St. Wilfrid's Parish Church.

Using this exit at present is dangerous needing care and patience because of the blind bends to both sides. The daily traffic flow increase would produce peak flows of even greater volume making this exit and entrance almost impossible.

Waiting at the centre of the road to turn right into the courtyard can be a frightening experience due to the blind bend just behind. The forecast increase in traffic would have a very high impact on safety.

This proposal by the applicant is not feasible. Residents know that LCC officials confessed their unawareness of the dangers on this stretch of road (cf. letter to C.Potter from S.McCreesh 22July2011). Now that the LCC is aware it is unbelievable to us that they would wish to pursue the scheme as it now stands.

The intractable nature of the safety issues here stems from the proposed slip road to Shefferlands roundabout. We request that it be removed from the scheme.

John Wilding, The Boat House.  
30<sup>th</sup>.April 2012

IPC Examination of Heysham M6 Link TR 10008  
Environmental Impact on protected species *Lutra lutra* (Eurasian Otter)  
Presented by John Wilding of the Boat House Halton , Unique reference number  
HEY XXXX, member of the Halton Residents' Group, Unique ref no. XXXX

### Otter Presence on the River Lune Between Halton and the Army Training Camp

Lancashire County Council presented an Otter survey of this area in 2003. It was prepared by ADAS and found no evidence of otters. No recent survey has been presented by LCC. The 2003 negative findings do not accord with the Technical Report in the Environment Agency's Fourth Otter Survey of 2000-2002 which gave increases in otter presence on the Lune (5 out of 18 sites). The EA's Fifth Otter Survey found twice as many otter sites on the Lune and stated that "otters are now found throughout the catchment" and that the Lune provides one of the main corridors for the re-colonisation of the area north of the urban area of Manchester\Warrington/Liverpool, particularly the Wyre catchment".

Living over the river bank I have gathered evidence of otters on the Lune between Halton and the Army Training Camp showing a considerable growth of the population especially over the last year on the river and in the surrounding habitat.

I attach, for the examination, the following evidence :-

1. A detailed log of otters at the Boat House made over the last year. This contains more than 700 sightings.
2. A compact disc (which will be sent to you under separate cover) showing edited CCTV footage of the above sightings.
3. A photograph of an otter holt near Halton Hall.
4. A selection of photographs taken between the M6 bridge and the sewage works at the Army Training Camp. These photographs were taken from a boat on the river and show otter resting places (essential to their survival), spraints and prints and an otter slide.
5. Photographs of established otter tracks ascending through the woodland where the proposed bridge would be built.

As an Appendix I attach "A Confidential Otter Survey of the River Lune between Halton and the Proposed Lune Bridge" (April 2012) completed by John McMinn and Hugh Woods. I have informed the IPC that I wish the examination to use all the attached material and that the confidential description of the survey does not apply to the examination.

It will have been necessary for the applicant to present an up-to -date otter survey and to have obtained the necessary licences. The evidence that there was no otter presence on the Lune according to the ADAS survey does not easily accord with Environment Agency's data and is long out of date and has been completely surpassed by the McMinn-Woods study.

In addition the ADAS survey falls short of being complete and professional on several counts – it used only spot checks (from vantage points easily reached on foot) rather than a linear inspection; the survey was carried out from the bank and not by boat from

the river, which is essential when surveying for the presence of otters; it did not show a methodology giving what kinds of evidence it was searching for nor how this search was achieved. Because the worth of an otter survey is dependent on the author's professional expertise and knowledge, confidence in any future work by ADAS would be dependent on a more thorough methodology being used.

#### Mitigation.

The measures to mitigate disturbance to otters are based on an insufficient preliminary survey and show a less than adequate knowledge of the local area and also of the needs of this protected species.

The first proposal by LCC is to build an artificial holt on the south bank of the river. This would not have been put forward as a serious plan if LCC had known that the south bank is a popular route for dog walkers. The daily presence of dogs means that there are fewer signs of otter visits to this bank. Otters will only construct a holt where they will be undisturbed. They would not use an artificial holt on this bank.

Otters, contrary to popular belief, spend most of their lives on land. They need many resting places along rivers and tributaries in order to dry out their finer fur and to avoid hypothermia. Making an artificial holt, even in good habitat, would not be, by itself sufficient mitigation where the habitat is degraded.

The usefulness of constructing of an otter fence to prevent road kill at this site needs to be judged in the light of the fact that otters are determined travellers overland with a range of 11 miles and up to 25 miles and that any fence would have to be 2 metres high with an effective overhang and reach 1 metre underground.

Taking the quality of the ADAS survey and the mitigation measures proposed any confidence that LCC have, at present, the necessary information and therefore ability to protect the lives and habitat of this protected species is open to serious question.

#### Proposed Bridge Position

The woodland between the M6 bridge and the sewage works is a very favourable habitat for lower Lune otters in that it provides a section of undisturbed banking with many roots for resting places and sharply rising land up which otters have established tracks to move away from the river in flood, to hunt and to make natal holts.

This section of woodland is narrowly constrained on both sides and is effectively less than 200 metres wide. The proposed dual carriageway would pass through the centre of this habitat necessitating the removal of a wide swathe of trees with concrete construction for a pier on the bank.

There are alternative positions for a Lune crossing that have not been assessed from the point of view of avoiding the degrading or destruction of this remaining habitat on which the otters are dependent and without which they cannot be protected.

John Wilding. April 28<sup>th</sup> April 2012.

---

# *A Confidential Otter Survey of the River Lune between Halton and the Proposed Lune Bridge.*

---

*(April 2012)*

---

*by John M<sup>c</sup>Minn & Hugh Woods*

---

## **Intention**

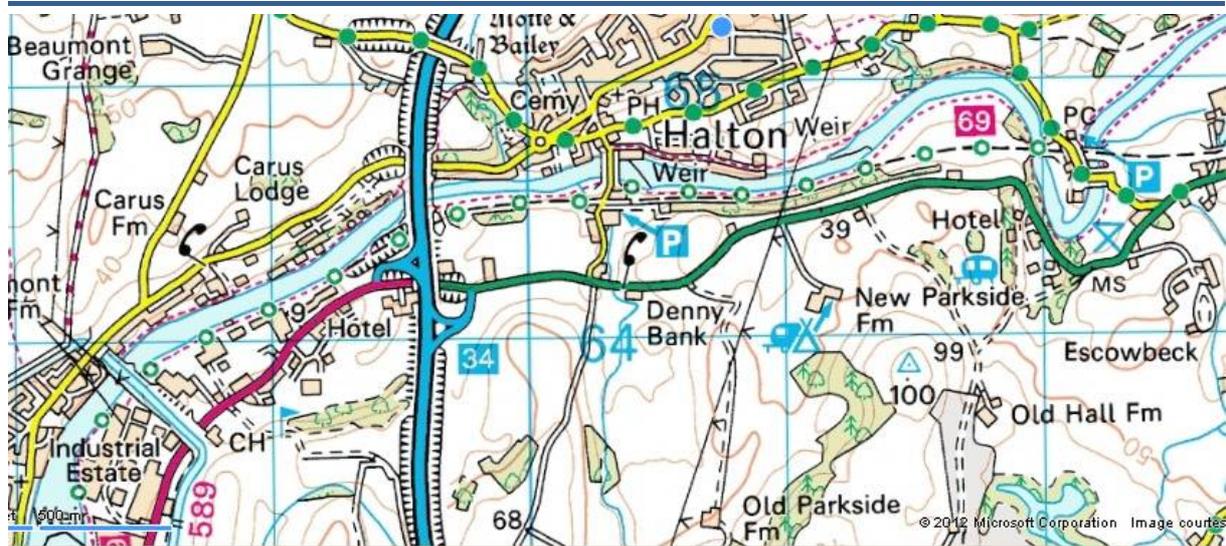
---

To establish the presence of and extent of the Eurasian Otter (*Lutra lutra*) within this area by surveying for the following otter signs :-

- Tracks
- Spraints
- Anal Jelly
- Prints
- Runs
- Layups
- Sign heaps
- Holts
- Castling

## **Map to show the general area under survey**

---



## Field Methods

---

- Linear surveying by means of electric boat, and on foot where practicable
- Use of long camera lenses/binoculars where access is restricted
- Recording by remote photographs and CCTV
- Identification of otter habitat
- Identification of otter prey
- Otter movements

## Historical Information

---

The European otter (*Lutra lutra*) is widely recognised as an emblem for nature conservation in the UK because it is an apex predator and an important biological indicator of the health of our rivers and wetlands. Monitoring the status of the otter, therefore, gives us a valuable measure of the state of our water and wetland ecosystems. In England it is a largely nocturnal animal and is rarely observed in the wild. It is, however, possible to detect its presence by searching for a variety of signs as outlined above. The otter suffered serious decline throughout most of its European range, and by the mid 1970s the UK otter population had been reduced to such an extent that it only survived in Scotland, parts of Wales and the West Country, with a few remnant populations in other parts of England. In fact the European otter was extinct in certain areas of the UK just 30 years ago.

## Eurasian Otter Current Legislation

---

The Eurasian Otter is listed as a UK priority species for conservation (UK Biodiversity Action Plan, 1995). The species is listed on Appendix I of CITES, Appendix II of the Bern Convention and Annexes II and IV of the EC Habitats Directive. It is fully protected under listing 5 of the Wildlife and Countryside Act 1981 with equivalent protection in Northern Ireland and Schedule 2 of the Conservation (Natural Habitats) Regulations 1994 (Regulation 38). The European sub-species are also listed as globally threatened in the IUCN/WCMC Red Data List.

## Legal status

---

Otters are currently increasing in number and distribution after a prolonged period of decline.

They receive protection under both the Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2010.

In the following description 'otter holt' includes hovers and couches, which are otter resting places above ground. Artificial holts are not considered as holts under the legislation until they are known to be used by otters.

### *The Habitats Regulations make it illegal to:*

- Deliberately capture, injure or kill an otter
- Deliberately disturb an otter in such a way as to be likely to significantly affect the local distribution or abundance of otters or the ability of any significant group of otters to survive, breed, rear or nurture their young
- Damage or destroy an otter holt
- Possess or transport an otter or any part of any otter
- Sell (or offer for sale) or exchange an otter

*It is also illegal under the Wildlife and Countryside Act to:*

- Intentionally or recklessly disturb any otter whilst it is occupying a holt
- Intentionally or recklessly obstruct access to a holt
- Otters and their resting places are fully protected
- It is an offence to deliberately, capture, injure or kill them
- To damage, destroy or obstruct their breeding or resting places.
- It is also an offence to disturb otters in their breeding or resting places.

## **Status of the otter in the local and regional area.**

---

The Eurasian Otter has historically been recorded along the extent of the R. Lune and its catchment area, largely due to the meticulous record keeping of successive otter hunting year books. In medieval times the otter was recorded as a fish, probably in order to overcome the Church's prohibition of meat consumption on Fridays. Otter hunting was never responsible for localized extinctions of otters as this would have been counterproductive to an activity designed to provide sport for humans, rather than a control method for the animal. The post-war rapid decline in numbers is generally considered to be attributable to the large scale introduction and use of organo-chlorine pesticides and PCBs, all of which are highly soluble, are environmentally persistent, concentrating successively in creatures as the food pyramid is ascended. The otter is the riverine apex predator, so consequently suffered the greatest ill effects, leading to biological inefficiencies especially in breeding. During this period until the discontinuation of these damaging chemicals the otter was rarely seen apart from anecdotal reports by fishermen. Since the protection afforded by, "The Wildlife And Countryside Act 1981" and "The Conservation Of Habitats And Species Regulations 2010" plus the accompanying directives on river water quality the otter has slowly re-colonized its former strongholds along the Lune, its tributaries and upland catchment.

## **Evidence For The Presence Of Otters In The Survey Area**

---

### *Video*

The first publicly documented photographic evidence was in the video format of a female otter swimming and gathering flotsam lining for a holt at the Crook o' Lune. This evidence proved crucial in preventing river bank development in 2006. The fact that this was (and still is) a natal holt demonstrates evidence of permanent otter presence, not simply as a transient otter "passing through", as cubs can remain with mothers for up to 18 months. This location is approximately 3 kms. (as the river flows) from the proposed development.

### *CCTV*

The owner of, "The Boat House", Halton has twenty four hour CCTV coverage in his boathouse which sits below his living room. Since the cameras were installed in 2010 he has recorded otters visiting up to four times per night, not only mother and cub and single dog otter, but also *different* mother and cub pairs. The CCTV coverage has a maximum memory of six months, but there is DVD coverage from previous periods. In recent months the owner has made a regular dated and timed inventory of otter visits.

### *Motion activated infra-red camera*

Bushnell motion activated infra-red camera sited in the above boathouse has recorded video and stills of various otter groupings in April 2012:

### *Spraints*

- Spraints are numerous in the above boathouse. They are deposited on the decking, on the deliberately placed boulders at the far end of the boathouse, on the boat securing ropes, and have been so plentiful in the boat itself that they have had to be removed by jet washing. On each visit each otter sprainted at least once, often leaving the black form of anal jelly without the undigested material of usual spraints.
- Sprainting points between Halton and the proposed development have been still photo recorded.
- All the spraints have been photographed from the vantage point of a flat bottomed electric boat which enabled close examination. Most were typical of river based otters being composed of fish scales and bones set in a black tar like matrix, with the typical otter olfactory signature. The latter is so strong within the boathouse that it can be detected in the entrance on a warm day.
- Nearly all the sprainting sites found were situated at the top of prominent features such as large rocks, or where a regular track way met the river. It is testimony to the regularity of the sprainting points that even after the Lune has risen and removed the looser components the black, tarry stains are still visible. Unlike in for example, Scottish coastal sprainting sites where lack of flooding allows considerable spraint deposition to form spraint mounds, no such mounds were discovered but as flooding receded otters have resprainted at the same sites.

### *Prints*

An otter has a most distinctive paw print quite unlike other potential river bank mammals such as dogs, foxes and badgers, and although mink is similar in pattern its much smaller size removes any conjecture. Prints were not visible in the light gravel leading up to some sprainting points, but were visible in the light, silty river deposits covering the concrete/stone of several landing stages, and in the shallow, silty areas leading out of the river. These were especially noticeable on the boat in the boat-house, as the boat-house contains very fine-grained silt overlain by shallow water...as the otters swim in they create a plume or cloak of very cloudy material which is transferred to the boat and to the decking at the side of the boat-house as they climb out of the water leaving distinctive prints.

### *Runs*

A run is a regularly used route made on land by otters. They are commonly found crossing meanders as a short cut in preference to swimming around the river bend. However, in this section of the Lune the suburbanised nature of much of the river bank, plus the lack of large meanders (apart from the Crook o' Lune) suggests such "short cut" evidence is unlikely, and was not surveyed for. In the section surveyed, whose bank side vegetation is characterised by overhanging willows and alder, with the tangled roots of many other broad-leaf tree species, plus the multitudinous cavities offered by the deteriorating stone-block masonry, it would be very easy to miss the type of otter run so conspicuous on a grass clothed river bank. However, a run was discovered in the vicinity of the Sewage Plant, clearly marked by a sprainting rock below it on the river edge, and leading up the soil based bank up into the ground layer foliage of bluebells. In places faint prints were discernible, and although the run *could* have been made by another mammal the signature of a spraint suggests otherwise. The run did not have vegetation high enough to produce the tell-tale otter type of "tunnelled" run, which distinguishes it from that of a badger or fox. In addition a fox or badger run tends to run laterally i.e. *along* a river in order to scavenge, quite the reverse of this run.

### **Layups**

A layup is where an otter rests or sleeps. In a less suburbanised environment an otter will often layup in an open position. No open layups were discovered, as was predicted. The river bank nature (as described in the section on Otter Runs), due to its abundance of potential layups, proved it difficult to distinguish *used* individual layups. Without extensive remote camera imaging it would be extremely difficult to itemise each potential cavity and root entanglement as an *actual* layup. Compared to a muddy estuarine or peat bog habitat the Lune otters have an almost unlimited choice of where to layup in well-concealed peace. However, layups were detected in river bank cavities on the North bank where the soil had been smoothed and compacted by repeated movement. They were inaccessible except from the river, they were externally marked by a spraint, and necessitated a short, but near vertical climb from the river. The remains of a fish was found in one of them.

### **Sign Heaps and Castling**

Sign heaps are usually composed of vegetation, either growing or dead, which is “scrabbled” into a pile by the otter’s front paws. It is then often used as a spraint point. Castling is a similar constructive process whereby an otter gathers sand, gravel, mud etc. together, often over a considerable period of time, in order to create a raised point. Similarly, they tend to be used as a sprinting point.

The topography of the Lune’s banks in the survey area dictated that there would be little evidence of either sign heaps or castling. Most of the riverside lawned areas suitable for sign heap creation appeared too used and too meticulously maintained to attract otters, and with the prevalence of alternative, superior sprinting points none were discovered. However, the longer grassed, less regularly mowed lawn at the boat house at Halton revealed an abundance of pulled grass where otters had rolled and played after immersion in the river. The otter run here to the river was evident on the bank, suggesting that this area is regularly used for such activities.

### **Holts**

A holt, in this report, is intended to signify a potential breeding place, although it can be used to describe a non-breeding layup such as a deep cavity in which an otter can sleep or rest. One such holt was identified. However, due to the sensitivity of a breeding otter to disturbance (and they can, and do breed at any time of the year), plus the illegality of potentially disturbing an otter the surveyors are reluctant to reveal the exact location of the holt as the introduction of this knowledge into the public domain could jeopardise the welfare of the animal(s). Suffice to say that the location has been logged by the Lancashire Police Wildlife Protection Officers in Preston, who have already acted to prevent the illegal felling of trees close to the holt. The holt may only be approached from the river and is set within a tangle of willow roots and thick scrub in sandy silt. It is unknown how far the cavity extends, but it appears to be a considerable distance. The entrance is smoothed soil, compacted by regular movement, and below the entrance there is a sprinting point on a prominent, horizontal root.

### **Habitat**

The right hand (North) habitat of the bank in the survey area is distinctly superior to the left hand (South) bank in terms of otter cover and opportunities for layups/holts due to its heavily vegetated and unkempt, overhanging nature, with its difficulty of access for people or in places only accessed by the residents of large houses with river frontage gardens. The left hand (South) bank is far less wooded, fewer trees overhang the water, and although there are plenty of river-bank sycamores whose exposed root networks are attractive to otters (85% of otter holts/layups along English rivers are within sycamore or willow roots) the area is far too open and receives far too much human access (the Lune Cycle Path follows the river closely here) particularly by walkers with unleashed dogs, that except at night this habitat is likely to prove far less attractive to otters. In a two hour morning period on a weekday on a warm April day in 2012 76 people were counted, 11 with dogs. The survey was not repeated, but if the figures were extrapolated it seems certain that during high Summer weekends this number would be considerably greater. It would be safe to assume for the largely (but not exclusively) nocturnal hunting of the Lune otters

this disturbance would place strain on hunting effectiveness in the reduced hours of darkness of the Summer months. The Lune could be classified as a mesotrophic system in terms of its productivity suggesting that otter "home ranges" (otters are not overtly territorial) probably overlap judging from the number of different individual otters caught on CCTV, and, therefore, do not need to forage as far as otters further upstream where the Lune is in a more oligotrophic i.e. less food productive ,catchment. All the otters viewed on camera appeared to be in good condition, and although the Lune, like many other North West rivers has suffered a decline in rod caught salmon and sea trout, plus a decline in eels, the piscine productivity of this area of the river appears high. There are very large numbers of shoaling fry and minnows, and it is probable that the resident otters follow a hunting principle known as optimal foraging theory, whereby the number of small fish caught is more energy efficient than a smaller number of larger fish. Catching enough food to survive would appear to be a stress otters here do not have to combat. CCTV footage shows otters eating small fish, eels, frogs and the occasional "spent" salmon returning from spawning. On the left hand bank there is far more open grassland/ pasture with a high density rabbit population. Otters will predate rabbits on occasion (as evidenced within their spraints) and this could provide a food reservoir should the riverine ecosystem experience stresses such as pollution incidents, severe icing up etc. The high quality of the water is revealed not only by the presence of the otters but also by other indicator species such as the plentiful dippers, kingfishers and goosanders, none of which will tolerate poor quality water (CCTV also shows an endangered water shrew which is also an indicator species). Mink have been trapped in the survey area until as recently as 2011 but there has been no visual evidence since then. There is apocryphal evidence suggesting that once otters fully re-colonize an area resident mink move out, and this may be true for riverine systems but the report surveyors have observed otters and mink sharing the same coastal habitat at Loch Suinart (Western Scotland) in close proximity, in fact ignoring each other, so it may be that the productivity of the habitat and the resulting competition or lack of competition for food may be the telling factor. However, if this theory is true it may well be that the Lune otters are only now approaching a threshold population.... in other words their population has not yet reached an equilibrium with the river's carrying capacity, and any threat or disturbance to their breeding or feeding success could threaten their population expansion downriver to the Lune estuary which, although it has high quality productive otter habitat, has yet to be re-colonized.



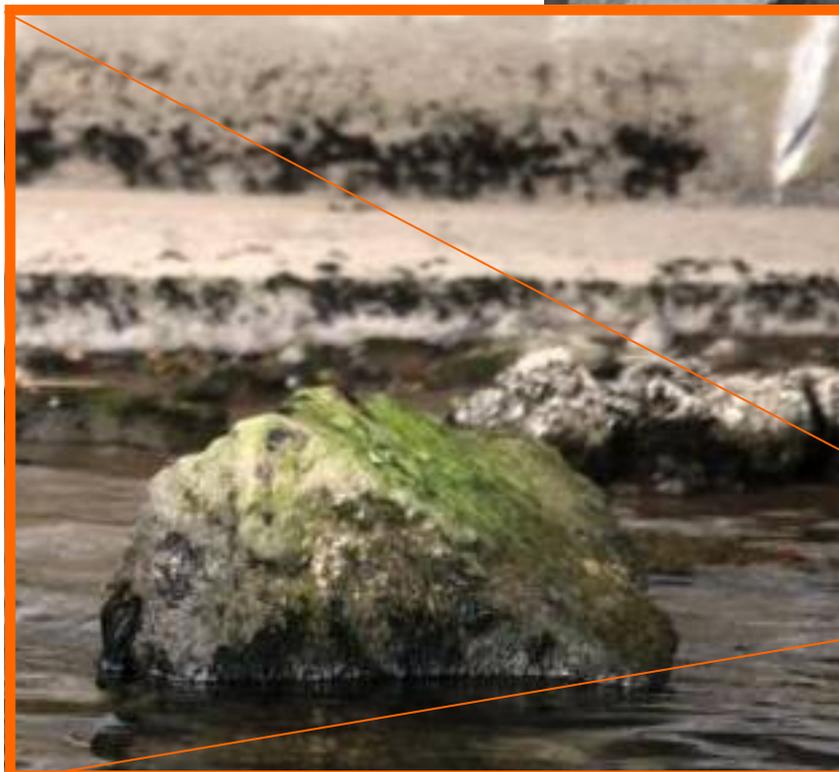
Photo 1

**Photo 1** shows an otter run rising from a gravel /boulder beach up into the woodland close to the sewage plant on the North bank. The boulder below the run is a sprainting site.

**Photo 2** shows the M6 bridge supports (South side). In the river is a large boulder used as a sprainting site. N.B. the green coloration on the down-stream surface indicates algal growth resulting from nutrients leached out of successive otter spraints. In contrast the adjacent rock is both spraint and algae free.



Photo 2





**Photo 3** shows the same boulder from a different angle clearly displaying the frequency of sprainting, revealed as the black, tar-like stream to the left and on the top. Otters often spraint below arches and overhangs, probably because the olfactory messages they contain will last longer. In more exposed locations the rate of spraint loss is linear with time, 50% disappearing in about 2 weeks., and 90% gone in 8 weeks.



**Photos 4 & 5** show numerous otter prints in both the [wet silt](#) and in the [dried silt](#) on the concrete at the base of the South side of the M6 bridge. The prints indicate a variety of paw size proving visits have been made by more than one individual otter.





**Photo 6**

**Photo 6** shows “The Boathouse” at Halton which is the scene of the CCTV otter footage. The owner has allowed the unrestricted growth of river bank vegetation in order to enhance the habitat for otters, unlike the bankside (**Photo 7** below) which has been “manicured” by felling to reveal what would otherwise have been an enclosed layout which would have had more otter appeal.



**Photo 7**



**Photo 8** shows the location of a holt (centre) within a thick tangle of undergrowth. **Photo 9** shows a close-up of the holt entrance revealing compacted earth, paw prints and the bones of a waterfowl.





Photo 10

Photo 10 shows the interior of the boathouse at Halton which provides the CCTV and stills footage of otters. The owner placed the rocks on the decking and the adjacent rectangular block in the water in order to provide the elevated features otters prefer to spraint on. These rocks and the ropes are coated with spraints. Photo 11 shows an otter run in a typical “tunnel” format with a spraint rock at the river margin. The undergrowth almost completely covers the run as it ascends the North bank of the river..



Photo 11



**Photo 12**

**Photo 12** shows a typical example of the narrow wilderness fringe of a lawned riverside property on the North bank, which if it is frequented by otters is likely only under the cover of darkness.

**Photo 13** shows an infra-red still of 3 otters visiting the boathouse at Halton one evening in April 2012. The 2 otters “peeping” out of the culvert are a mother and cub who are inspecting a dog otter who arrived later. The 3 otters all sprainted and inspected each other’s spraints.....the boathouse owner has at least 18 months of high quality CCTV footage showing a wealth of otter behaviour and interaction worthy of a PhD study.



**Photo 13**



**Photo 14** shows a typical RTA casualty with little external trauma but instantly fatal internal impact injuries. In the Summer of 2011 the UK officially became the most densely populated country in Europe, and one of the most tragic consequences of this crowded life-style is the damaging effect this has on our beleaguered wildlife.

## Survey Conclusions

---

- There is a healthy and varied population of otters in this surveyed stretch of the Lune. Although no very young cubs were recorded the ages ranged from several months to adult. Both male and female otters were recorded, although females outnumbered males considerably.
- The river appears to offer a sustained and varied diet to maintain the current otter population.
- Despite the fact that the Lune floods up to 9.97 meters (1995 at Halton) so at times inundating the optimum terrestrial habitat e.g. layups, holts, the runs running perpendicular to the river suggest the otters may have holts some distance from the river above maximum flood levels in order to avoid such events. It is imperative, therefore, that the areas these runs lead to remain undeveloped and undisturbed.
- The left hand bank (South) side appears to have less otter presence probably due to (i) the presence of the Lune Cycle Path and attendant disturbance, and (ii) the lack of thick bank side vegetation cover.
- The right hand bank (North) side has the greatest evidence of otter presence for the inverse of the reasons given for the South bank.
- Neither bank offers much more than a narrow fringe of “wilderness cover” with too much existing development and human disturbance to allow otters to range far from the river banks (as otters have the freedom to do in areas such as Western Scotland). It is, therefore, of paramount importance that this cover remains intact and undisturbed.
- Otters are the river’s apex predators and are threatened by few animals other than dogs. Their main threat to survival, especially in an area such as this with medium to heavy traffic levels, are RTA’s (road traffic accidents) . Otters do not attempt to evade vehicles at night or speed up to complete their road crossing safely. They often cross roads diagonally and thus, increase their time of exposure to danger. When a male cub reaches maturity it leaves its mother and searches for its own home range, a vacant stretch of river without a resident male. This can entail months of cross country travel, often crossing water sheds to reach another river system, and contrary to popular belief such otters can be encountered many miles from water. It is at such times that otters fall prey to RTA’s, and the vast majority of such casualties are male. Any increase in traffic in this area would therefore result in further mortality. Lancashire County Council estimates an increase of 74% in road traffic along Halton Road which runs parallel to the Lune. Green (1991) identified road traffic as the largest and most rapidly expanding cause of otter mortality.
- Otter populations in Eastern and South West England and in the Netherlands have suffered from very shallow gene pools resulting in genetically caused breeding problems. The successful migration of neighbouring dog otters to invigorate resident populations is vital to overcome this problem of genetic insularity. Every time a young dog otter is killed on a road this genetic diversity, necessary for the congenital health of a population is reduced.
- Otters reach sexual maturity at two years old; their life expectancy in the wild averages 4-5 years (although in captivity they may reach 15); a female generally rears two cubs per litter, taking usually just in excess of 12 months before they are ready to leave their mother. These stark facts mean that in her lifetime a female will produce only four cubs, which given the high mortality rate of both cubs and adults explains the very slow re-colonization of England by the otter. These population dynamics dictate that where traffic increases the general otter population and its expansion will be jeopardized.

- The turbidity of the Lune varies according to flood rates, time of year of catchment run-off e.g. ploughing times, BOD and fertility etc. Otters can locate and catch their prey in water with poor visibility as experiments with captive animals have proven, but their diving times increase and their hunting success rates decrease so any proposed development which results in increased silt/ soil run off will reduce otter hunting efficiency, and as an animal with minimal subcutaneous fat to act as a food reserve the otter has to eat frequently to maintain (a) its energy levels for its demanding lifestyle and, (b) to fuel its high metabolic rate, caused by cold water submersion. In addition more widespread ecological repercussions could ensue from increased turbidity, silting etc. within the food web which could result in negative effects in terms of bio-diversity e.g. prey numbers, prey variety, etc.
- The Lune otters are primarily nocturnal hunters and any night time construction, movement disturbance would have an especially detrimental effect on their hunting efficiency and breeding/ nurturing of cubs.

*In conclusion the surveyors can assert with complete confidence:-*

- Otters are permanent residents i.e. are indigenous, along this stretch of the Lune .
- The North bank offers by far the most otter attractive terrestrial-river fringe habitat (although this is already dangerously narrow due to the existing suburban/ industrial infrastructure encroaching on it).
- Finally, with considerable confidence that, the area of woodland between the M6 bridge and the sewage plant, on the North bank, where there is a regularly used otter track leading up above maximum flood-levels is the optimum site for a natal holt.

## Bibliography and Acknowledgements

---

- Bouchner, M. "Animal Tracks"
- Chanin, P. "Natural History of Otters"
- Chanin, P. "Otters"
- Davies, M.J. "The Chemical Ecology of Mustelids" Dept. of Biological Sciences, Hull University
- Davies, M.J. "The Chemical Basis of Odour Recognition in the Eurasian or European Otter, *Lutra lutra*" PhD dissertation [2008] Dept. Of Biological Sciences, Hull University
- Environment Agency, "5th Otter Survey of England 2009/10 Technical Report"
- Gorman, M.L, Jenkins, D. and Harper, R.J. "The Anal Scent Sacs of the Otter [*Lutra lutra*]" *Journal of Zoology* 186 [London]
- Green, J. "The Impact of Hunting, Poaching and Accidents on Otter Survival" *Habitat* 6
- Hutchings, M.R. and White, P.C.L. [2000] "Mustelid Scent Marking in Managed Eco-systems: Implications for Population Management" *Mammal Review* 30
- Kruuk, H. "Otters: Ecology, Behaviour and Conservation"
- Kruuk, H. "Wild Otters: Predation and Populations"
- Mason, C.E. & MacDonald, and S.M. "Otters: Ecology and Conservation"
- MacCaskill, B. "On The Swirl of the Tide"
- Sarney, T&E. For allowing access to the Crook o' Lune video footage of 2006.
- Spiby, D. "Survey to Record and Assess the Distribution of Otters in South Cumbria 2006". Tech. Note:NB847 Environment Agency.
- Trowbridge, B.J. "Olfactory Communication in the European Otter [*Lutra lutra*]" PhD. dissertation. University of Aberdeen
- Wayre, P. "The Private Life of the Otter"
- Wilding, J. For allowing us to survey both his boathouse and garden, and to allow access to his CCTV footage and written records.
- Williams, J. "The Otter Among Us"
- Williams, J. "Otters"
- Wolkers, H. [www.edepot.wur.nl/164943](http://www.edepot.wur.nl/164943) (problems with genetic isolation in Friesland)



1.03.2012

under M6 bridge - north side.

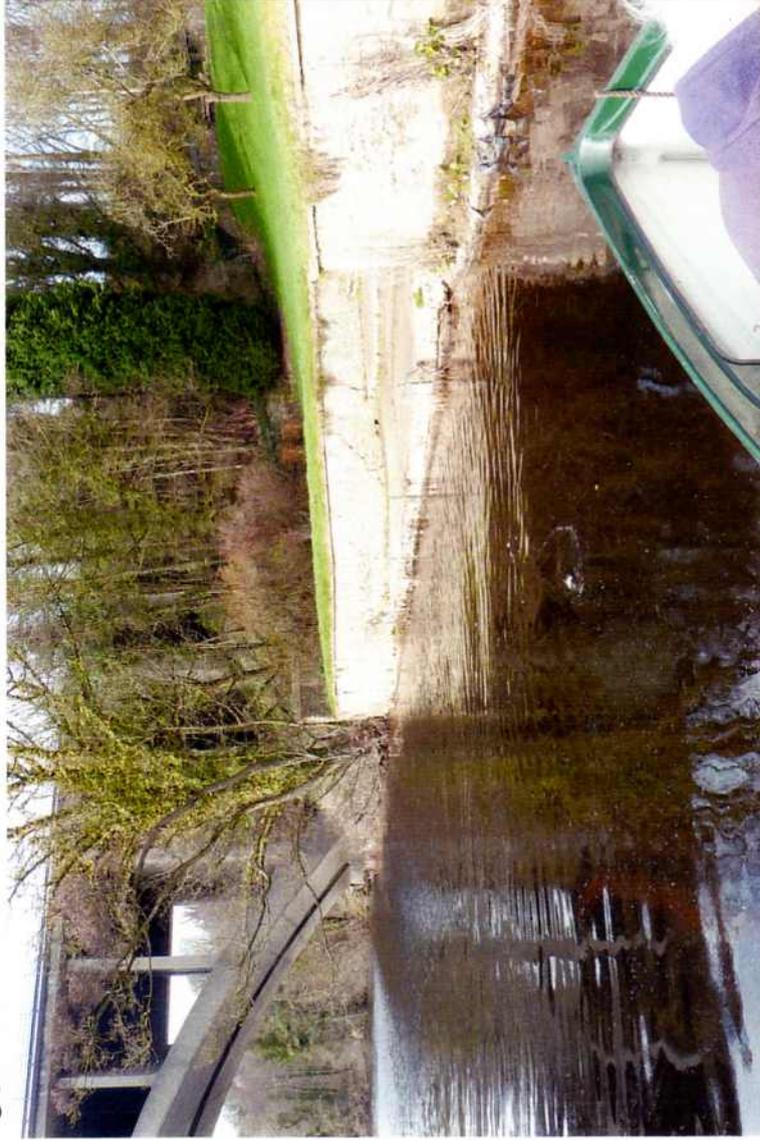
otter prints 1. looking downstream

2. looking upstream

6.03.2012

Garden bankside  
adjacent to M6  
bridge,  
showing position  
of photos 7 and 8.

6.

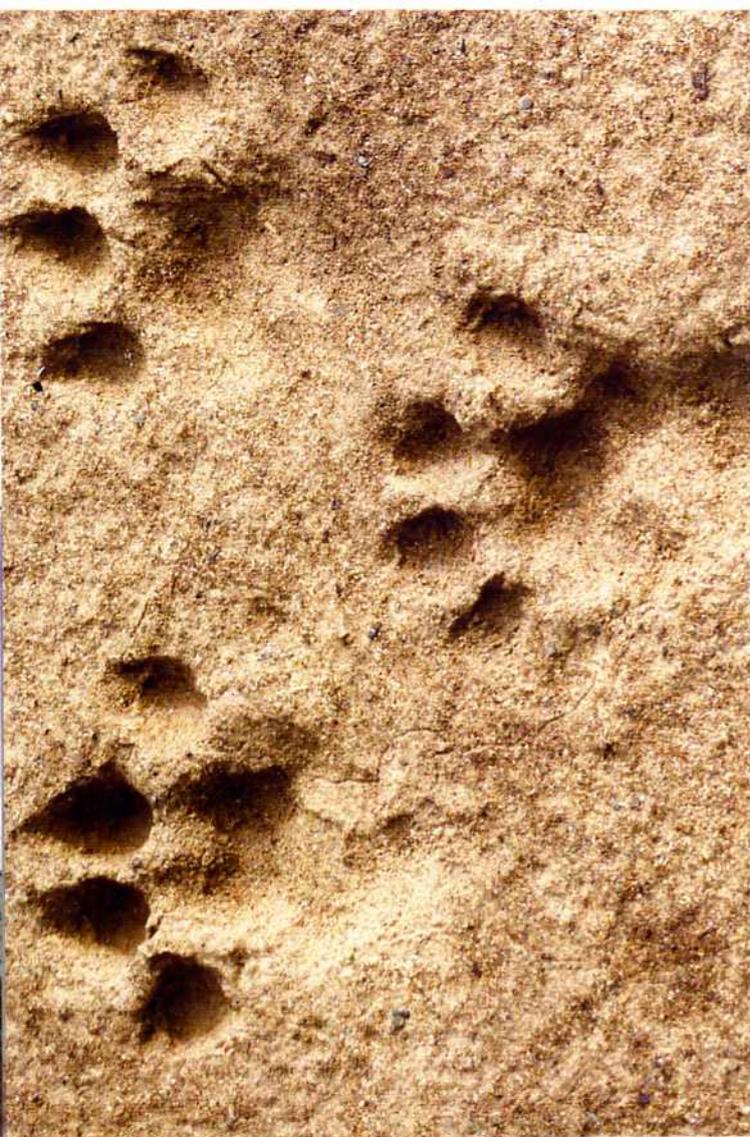


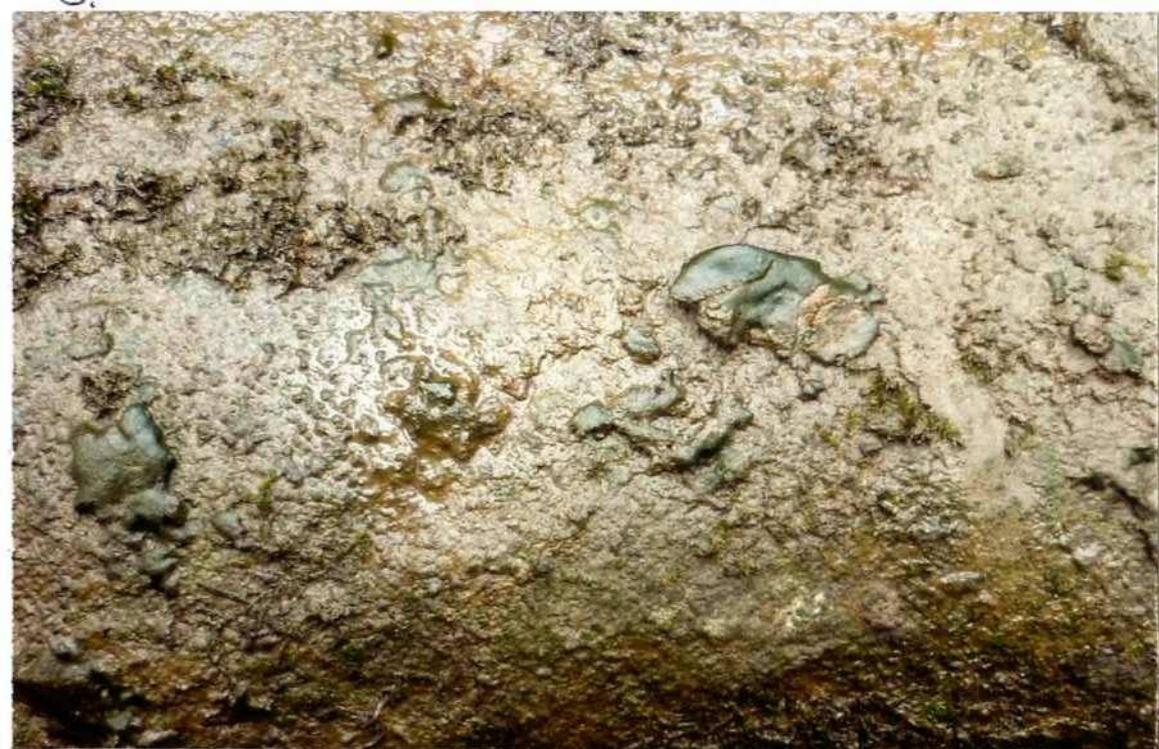
7 and 8 other prints  
in river silt on  
lowest step of photo 6.

7.



8.





otter spraints and otter holt in woodland  
between Mb bridge and sewage works.  
Bottom photograph is a close-up.

5. Otter resting place, approx 50 metres downstream from centre of M6 bridge.

3.



4. Otter spraints on muddy area in front of resting place (3).  
5. Otter prints at the same position.

5.







ess up of 11. showing prints by holt



and 14 show location of photos 3, 4, and 5 in relation to woodland





... 71 1 data 2 4 25 in distance 2 21 12



16. Pismo Lake with 1.5m of water, a large amount of water to the lake.



