# Appendix 10.6

# Kingfisher Survey Report

# M8 BAILLIESTON TO NEWHOUSE

## KINGFISHER ASSESSMENT OF NORTH CALDER WATER

**Final Report**

| | |
|---|---|
| **Prepared for:** | **Mouchel Fairhurst** |
| **Prepared by:** | **Malcolm Ginns** |
| **Approved by:** | **Karen Atkins** |
| **Date:** | **February 2006** |
| **Young Associates Ref:** | **B4400/R6/Rev2** |

# TABLE OF CONTENTS



## LIST OF FIGURES



## LIST OF APPENDICES

# 1. INTRODUCTION

## 1.1 Background

1.1.1 During the Stage 2 DMRB assessment of the M8 Baillieston to Newhouse scheme, consultees reported that kingfishers *Alcedo atthis* were known to be present along the North Calder Water in the vicinity of Bargeddie. The kingfisher is a species that is easily missed during general breeding bird and walkover surveys, therefore a dedicated kingfisher survey was undertaken along the North Calder Water.

1.1.2 In general, all wild birds, their nests and eggs are protected by law under Section 1 of the Wildlife and Countryside Act 1981 (as amended). It is an offence to:

- intentionally kill, injure or take any wild bird;
- intentionally take, damage or destroy the nest of any wild bird while that nest is in use or being built;
- intentionally take or destroy an egg of any wild bird;

1.1.3 Kingfishers are listed under Schedule 1 of the Act, which extends protection to cover them against disturbance to both adults and their dependent young at all times whilst they are breeding. The Nature Conservation (Scotland) Act 2004 extended protection for kingfishers further, to include the concept of "reckless" acts constituting an offence; adding protection at all times to sites habitually used for nesting, and making it an offence to obstruct or prevent the species from using its nest.

## 1.2 Conservation Status of Kingfisher in the UK

1.2.1 The kingfisher is listed as Amber (25-50% decline) in Birds of Conservation Concern (RSPB) on account of the historical decline in its population. The UK kingfisher population declined along linear waterways (its principle habitat) until the mid-1980s, since when, like many species whose ecology is closely bound with surface water quality, it seems to have made a recovery as water quality has improved. The UK population fluctuates significantly, but there is no long-term trend as the main determinant of numbers in the breeding population is weather-related mortality over the winter. Kingfishers need to feed constantly over winter in order to survive, and populations can suffer severely during harsh winters. However, due to their high fecundity and large brood sizes: (up to six chicks per brood) and up to three broods per season, their potential for rapid recovery is high. Southern Scotland represents the northern limit of the main British populations' distribution (excluding Northern Ireland). However there is a gradual colonisation northwards and there are small out-post populations in the highlands as far as Inverness.

## 1.3 Habitat Preferences of Kingfishers and Factors Affecting Their Presence

1.3.1 Kingfishers are found along rivers, canals and at still water bodies such as lakes and ponds. The nest is a deep tubular tunnel; eggs are laid between May and July with broods consisting of 5-7 eggs and up to three broods per season. River

engineering measures, e.g. reinforcement of banks, is one of the features that can greatly reduce the availability of suitable nesting sites, as it prevents kingfishers tunnelling into the banks.

1.3.2 Trees or bushes with branches overhanging the river provide important fishing perches. The kingfisher relies on its very sensitive sight to hunt fish such as sticklebacks and minnows and is hampered by pollution or heavy sedimentation that reduces its ability to locate fish in the water.

1.3.3 The upended roots of fallen trees along banks provide good nest sites and nests are usually constructed in vertical banks. Flooding and high river levels during the nesting season can have detrimental impacts on kingfishers by flooding their nest chambers.

## 1.4 Rational of the Kingfisher Survey

1.4.1 The aim of the kingfisher survey was to provide baseline information against which to assess the impacts that structures associated with the proposed re-alignment of the M8 motorway and associated improvements – particularly at Shawhead Junction, will have on kingfishers. To fulfil this objective this survey concentrated on areas close to existing and proposed crossing points.

1.4.2 The kingfisher is a difficult species to survey, due to its low population density, its shy nature and – in the case of the North Calder Water – the difficulties associated with surveying inaccessible portions of the watercourse. To fulfil the requirements of the kingfisher survey, the methodology was expanded to assessing the habitat along the river corridor for its suitability for kingfishers. The following seven criteria were chosen for assessment:

- water quality;
- river flow;
- bank features/substrate;
- angle of the bank;
- agricultural improvement of bankside habitat;
- availability of overhanging branches; and
- human (and dog) disturbance.

1.4.3 These criteria were selected as they encompass features identified in species action plans for kingfishers as key requirements/factors associated with the decline of the kingfisher in the UK.

## 2. SURVEY METHODOLOGY

2.1.1 The survey was conducted by an experienced ornithologist with experience in a wide range of bird survey techniques (including species-specific surveys).

2.1.2 The survey used a methodology based on that used by the Wildfowl and Wetland Trust's Winter River Bird Survey. The method was modified for the purposes of this study in that section lengths were reduced to 200m due to the focus of the study.

2.1.3 A total of 20 200m sections were assessed for signs of kingfisher and suitability of habitat for the species. Two surveys were undertaken, the first in June 2005 during the breeding season where 12 sections were surveyed and the second in October 2005 where 12 sections were surveyed. These will be referred to as the breeding season survey (BS) and the autumn season survey (AS) respectively. There was some overlap between sections in the BS and AS surveys, but higher water levels during the autumn survey prevented all of the July sections being closely re-surveyed in October.

2.1.4 The assessment for suitability of habitat for kingfisher was based on the following criteria:

1. Water Quality

Pollution affects the availability of prey (fish) in the watercourse and, in particular in the North Calder Water, pigmentation of the watercourse could affect the kingfishers' ability to see its prey, and thus has a negative impact on its hunting ability.

2. River Flow

River flow affects the levels of oxygen in the water column and thus the availability of fish for the kingfisher to prey on.

3. Bank Features/Substrate

The kingfisher requires vertical banks of compact sand or earth to excavate its 2m long nesting tunnel and nest chamber. Stony or rock/reinforced banks prevent the birds from excavating their nesting tunnels.

4. Angle of the Bank

The kingfisher prefers to excavate its nest tunnel into a vertical bank rather than a gently sloping bank, as those excavated into the latter are liable to flooding.

5. Agricultural Management of Bankside Habitat

The agricultural improvement of bankside habitat (for example where scrub has been cleared to allow pasture to be developed up to the waters edge or to allow cattle access to the watercourse) has a negative impact on kingfishers by reducing the number of perches available, increasing erosion and consequently allowing easier access to nests by predators. Agricultural run-off (cattle slurry,

fertiliser and pesticide run-off) cause problems by affecting the number of fish in the watercourse, or poisoning the kingfishers'.

6. Availability of Overhanging Branches

The kingfisher requires suitably situated perches to watch for fish in the water and to act as "marker-posts" to define the limits of its territory.

7. Human (and dog) Disturbance

The kingfisher is susceptible to disturbance from humans and dogs (although not necessarily from anglers) due to its reclusive nature.

2.1.5 It should be noted that the sub-categories of the categories outlined above (detailed at Appendix 1) do not conform to linear scales but are rather descriptions of habitat characteristics that are easily identifiable in the field.

## 2.2 Limitations of the Survey

2.2.1 Not all sections surveyed during the breeding season (May-July) were accessible during the autumn survey due water levels making some sections dangerous to survey. However it is considered that this would not materially alter the findings of the survey.

## 3. RESULTS (SEE APPENDIX 2)

### 3.1 Habitat Suitability for Kingfishers

3.1.1 The North Calder Water provides suitable foraging habitat for kingfishers along most of its length. The banks consist mainly of rock, large stones and gravel, or are artificially built up using concrete. As a consequence there are currently limited opportunities for kingfishers to nest.

3.1.2 Along most of the river there is little by way of disturbance to kingfishers and the water quality is for the most part suitable. In the vicinity of Bankhead Farm (NS711 629) there is a small watercourse entering the North Calder that was a deep red colour (probably from mining pollution) that would prevent the species from fishing.

### 3.2 Kingfisher Sightings and Nest Holes during the Breeding Season Survey

3.2.1 Details of sightings and signs of kingfishers along the North Calder Water and Luggie Burn during the July survey appear in the Table at Appendix 2. During the summer survey two sightings were made of kingfishers (one at NS712 849 and one at NS711 629) in BS 12 and it is probable that these were of the same bird, most likely a male patrolling its breeding territory by flying up and down the watercourse between the two limits of its territory. There was a possible (although un-confirmable due to bank erosion) old nest site on the north bank in section BS 9.

### 3.3 Kingfisher Sightings and Nest Holes during the Autumn Survey

3.3.1 Details of sightings and signs of kingfishers along the North Calder Water and Luggie Burn during the October survey appear in the Table at Appendix 2. During the autumn survey one kingfisher was seen at the weir in section 8 (NS734 619). No other sightings of kingfisher were recorded during the survey. No potential nest holes were identified during the survey.

### 3.4 Other Species Recorded

3.4.1 Signs of water vole burrows in the banks of the North Calder Water were not seen during the survey visits.

# 4. DISCUSSION

## 4.1 Habitat Characteristics along the North Calder Water

4.1.1 The North Calder Water runs through a range of substrates including earth and rock banks along with a large number of sections reinforced with concrete and sand bags. The sections of watercourse that consist of built up/reinforced banks are unsuitable for nesting kingfishers as they are prevented from excavating tunnels into the banks. For the most part the bankside habitat is dominated by naturally regenerating scrub and old industrial-related structures, such as water pipes, bridges and tunnels. Some of these structures will be beneficial to kingfishers by providing additional perches. Due to the historical reinforcement of the banks along much of the watercourse, there are currently limited opportunities for kingfishers to nest along the North Calder. Kingfishers are likely to be encountered flying along the entire watercourse and foraging along the majority of the North Calder Water's length with, the exception of those areas subject to pollution from incoming Red Burn and Luggie Burn.

## 4.2 Relationship between Habitat Characteristics and Kingfisher Sightings

4.2.1 The results of the survey show that, as might be expected, kingfishers are closely associated with steep or vertical banks of compact earth. The total length of watercourse surveyed was 3.2km (3200m). A total of 14 separate sections, constituting 2.8km (2800m) were suitable for foraging by kingfishers, the remaining 400m were unsuitable for the species. Kingfisher sightings were restricted to two sections (sections XII and XVI). Section XII showed signs of pollution from old mine workings but had vertical, wet earth banks suitable for nesting. Section XVI was silty and consisted of dry earth banks with an abundance of overhanging branches. Whilst no confirmed nests were found, if there are kingfisher nests along this stretch of watercourse section XVI is the mostly likely to host such nests. It is also possible that there are active nests along the Luggie Burn north of section II however; no active nests were found in section II despite intensive searching.

4.2.2 Overhanging branches are important for kingfishers in that they provide suitable perches for the birds to fish from. The shading of the water by branches and leaves is not an issue as the kingfisher has sharp sight and will be able to see clearly through any shadows cast by leaves and branches. However, heavy siltation or discolouration of the watercourse can hamper the kingfishers foraging ability.

# 5. SUMMARY

## 5.1 Key Points

5.1.1 The North Calder Water provides suitable habitat for kingfisher along its entire length, although some areas are unsuitable for nesting due to reinforced or rock banks. Some sections are of limited value for foraging due to heavy discolouration of the water by pollution from old mine workings.

5.1.2 Based on the results of the 2005 surveys, sections XVI, XIX and XX are the most likely locations for nesting activity.

5.1.3 During the October survey kingfishers were confirmed to be present suggesting that it is likely that the birds are present in the area all year round. It will be necessary for use by kingfisher of the parts of the North Calder Water where works are proposed to be monitored prior to the commencement of works on site, so that appropriate measures can be taken to prevent disturbing both wintering and breeding kingfishers (if confirmed) along the North Calder Water. Apart from the legal protection afforded to the birds during the breeding season under the Wildlife and Countryside Act, wintering kingfishers are particularly prone to disturbance as they are required to fish more-less constantly to provide the energy need to survive during the winter, this is particularly so during cold spells.

## 6. REFERENCES

Buckton, S.T. and Ormerod, S.J. (1997). **Use of a new standardized habitat survey for assessing the habitat preferences and distribution of upland river birds**. *Bird Study* 44: *327-337*.

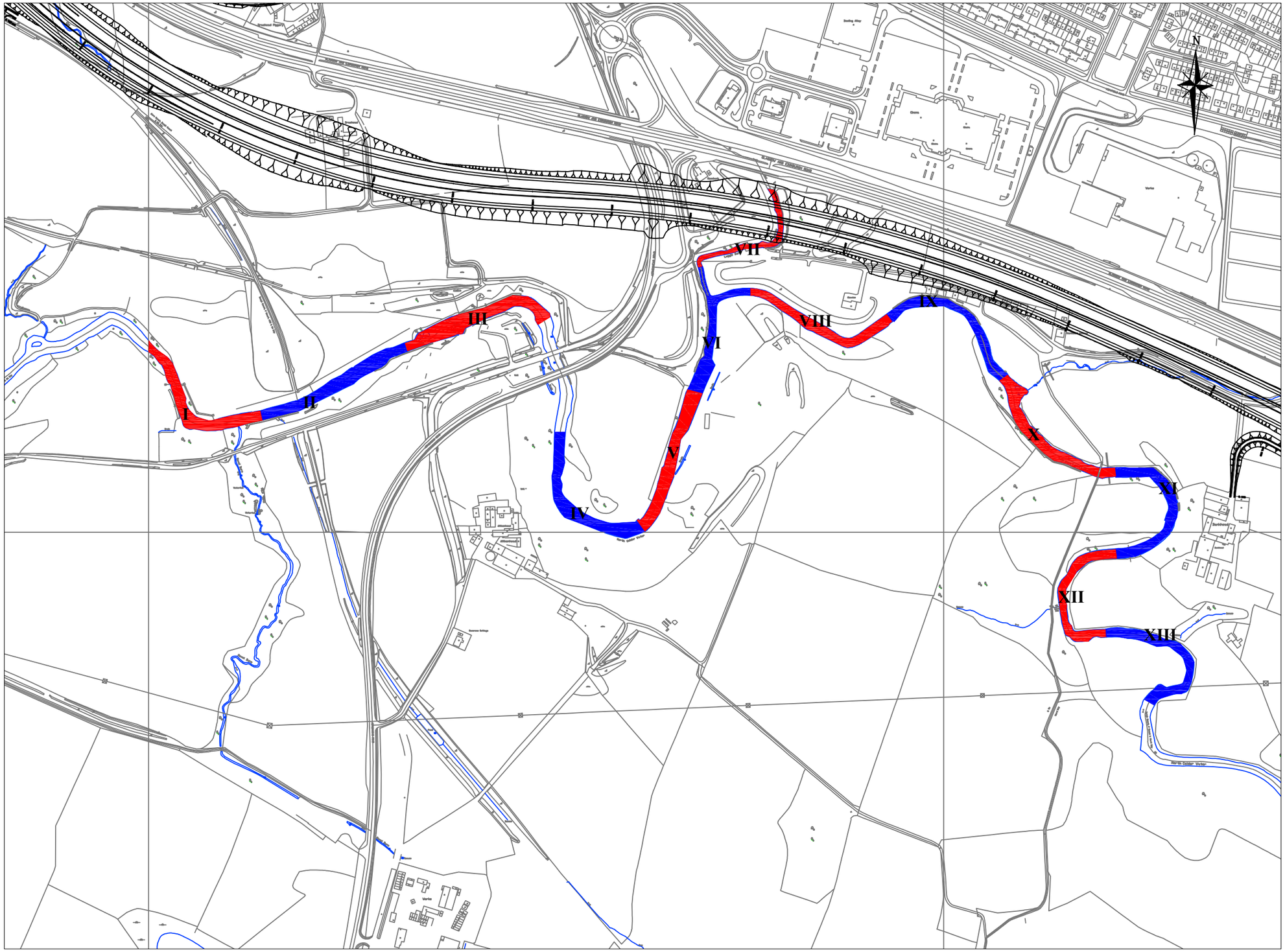
Gilbert, G., Gibbons, DW & Evans, J. (1998). **Bird Monitoring Methods: a manual of techniques for key UK species**. The Royal Society for the Protection of Birds.

Reynolds, S.J. and Hinge, MDC. (1996). **Foods brought to the nest by breeding Kingfishers *Alcedo atthis* in the New Forest of southern England**. *Bird Study* 43: 96-102.

Wilson, J.D. (1996). **The breeding biology and population history of the Dipper *Cinculus cinculus* on a Scottish river system**. *Bird Study* 43: 108-118.

Wildfowl and Wetlands Trust (2005). **Postponement of the Winter River Bird Survey January 2004**. http://www.wwt.org.uk/riversurvey

**FIGURES**




## Key

I Survey Section

Alternate sections

CLIENT

TRANSPORT SCOTLAND

An agency of SCOTTISH EXECUTIVE

PROJECT TITLE

M8 Baillieston to Newhouse

| REV | REVISIONS | BY | CHKD | APP'D |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

AMENDMENTS



| | | | |
|---|---|---|---|
| DESIGN BY: | MCG | CHECKED BY: | CM |
| DATE: | February 2006 | DATE: | February 2006 |
| DRAWN BY: | MCG | APPROVED BY: | UM |
| DATE: | February 2006 | DATE: | February 2006 |

X FINAL REPORT

ENGINEER

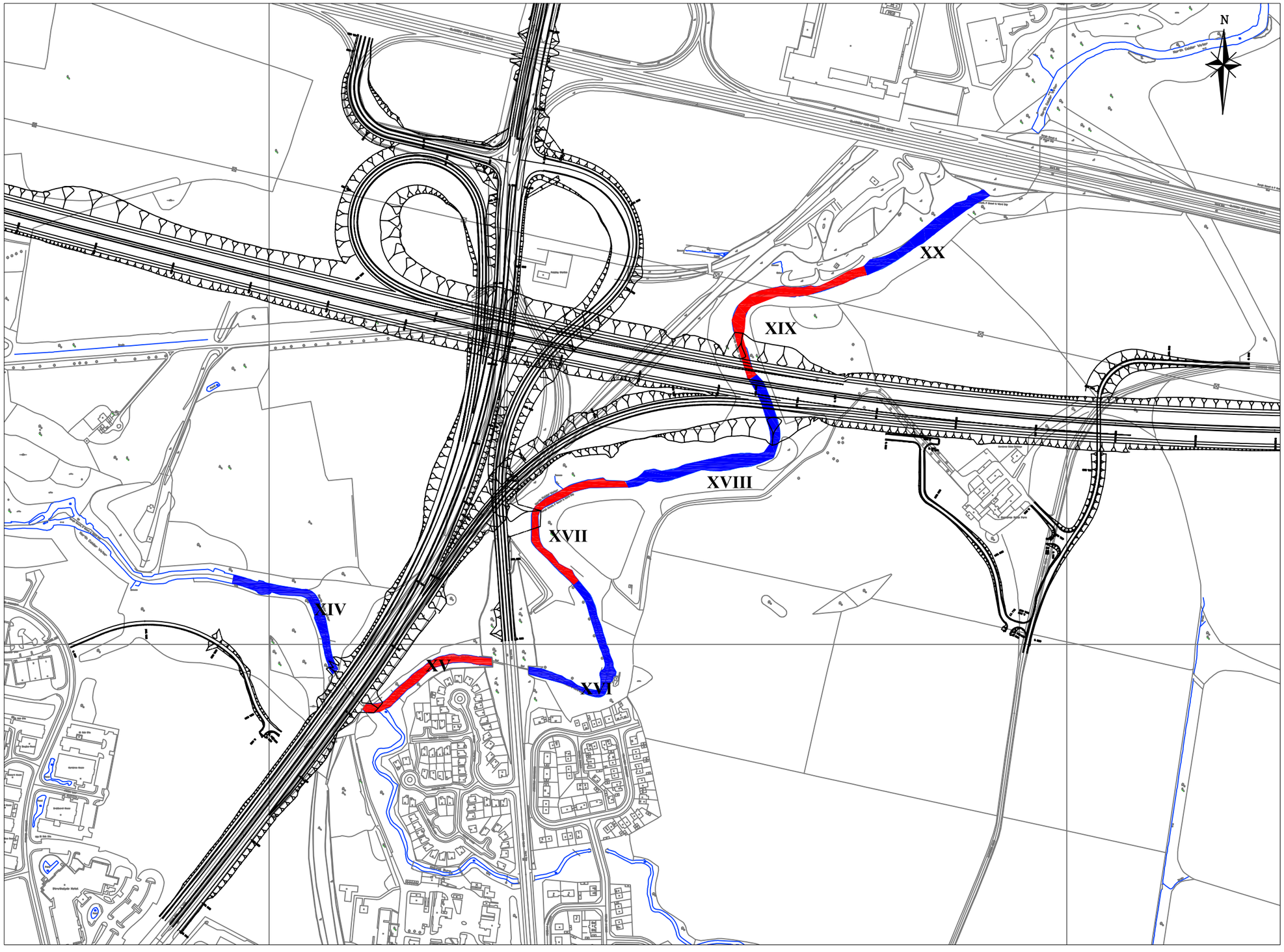
Mouchel FAIRHURST

IN ASSOCIATION WITH

SIAS YA

# Kingfisher Survey Sections

| SCALE | DRAWING NO | REV |
|---|---|---|
| 1:5000 AT A3 | Figure 1a | 2 |




## Key

I Survey Section

Alternate sections

CLIENT

TRANSPORT SCOTLAND

An agency of SCOTTISH EXECUTIVE

PROJECT TITLE

M8 Baillieston to Newhouse

| REV | REVISIONS | BY | CHKD | APP'D |
|---|---|---|---|---|
| | | | | |

AMENDMENTS



| | | | |
|---|---|---|---|
| DESIGN BY: | MCG | CHECKED BY: | CM |
| DATE: | February 2006 | DATE: | February 2006 |
| DRAWN BY: | MCG | APPROVED BY: | UM |
| DATE: | February 2006 | DATE: | February 2006 |

X FINAL REPORT

ENGINEER

Mouchel FAIRHURST

IN ASSOCIATION WITH

SIAS YA

DRAWING TITLE

**Kingfisher Survey Sections**

| SCALE | DRAWING NO | REV |
|---|---|---|
| 1:5000 AT A3 | Figure 1b | 2 |

# APPENDICES

**Appendix 1**

**HABITAT ASSESSMENT CRITERIA**

**Suitability of habitat for Kingfishers**

(Circle as appropriate)

Water Quality

| | | | | |
|---|---|---|---|---|
| Clear | Slightly Silty | Silty (but can still see bottom) | Very Silty (Can't see bottom) | Polluted |

River Flow

| | | |
|---|---|---|
| Rapid | Medium | Slow |

Angle of Bank

| | | | |
|---|---|---|---|
| Vertical slope (90˚ to water surface) | Steep slope (40-80˚) | Gentle Slope (20-40˚) | Very Slight (0-20˚) |

Bank Substrate or Features

| | | | | | | |
|---|---|---|---|---|---|---|
| Loose earth | Dry earth | Wet earth | Vegetated | Gravel | Stony | Rock |

Agricultural Improvement of Bankside Habitat

| | | | |
|---|---|---|---|
| Bankside habitat highly improved | Bankside habitat improved | Bankside habitat slightly improved | Bankside not improved |

Availability of branches overhanging river (to act as perches)

| | | |
|---|---|---|
| Lots of overhanging branches | Some overhanging branches | No overhanging branches |

Level of Human Disturbance (including dogs)

| | | | |
|---|---|---|---|
| No Disturbance | Slight Disturbance | Anglers | Regular Disturbance |

**APPENDIX 2**

**Table 1: Habitat Characteristics and Kingfisher Sightings along the North Calder Water, June and October 2005 (see Figures 1a and 1b for section numbers).**

| | Description of section/habitat features | | | | | | | Kingfisher signs recorded during surveys | | Section suitable or unsuitable for: | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Section<br>BS – Breeding Survey, AS – Autumn Survey | Water Quality | River Flow | Angle of Bank | Bank Substrate | Bankside Agricultural Improvement | Availability of Overhanging Branches | Level of Disturbance | Kingfisher Sighting | Nest | Foraging | Nesting |
| I<br>(1BS) | Slightly silty | Medium | Gentle Slope (20-40˚) | Wet earth, Vegetated | Slightly improved | No | Slight | None | None | Suitable | Unsuitable |
| II<br>(2 BS) | Slightly silty | Medium | Vertical | Wet earth, Vegetated | Not improved | Some | Slight | None | None | Suitable | Suitable |
| III<br>(3 BS) | Slightly silty | Rapid | Gentle Slope (20-40˚) | Rock | Not improved | No | Slight | None | None | Suitable | Unsuitable |
| IV<br>(4 BS) | Slightly silty | Medium | Vertical | Wet earth, Vegetated | Not improved | No | Slight | None | None | Suitable | Suitable |

| | Description of section/habitat features | | | | | | | Kingfisher signs recorded during surveys | | Section suitable or unsuitable for: | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Section<br><br>BS – Breeding Survey, AS – Autumn Survey | Water Quality | River Flow | Angle of Bank | Bank Substrate | Bankside Agricultural Improvement | Availability of Overhanging Branches | Level of Disturbance | Kingfisher Sighting | Nest | Foraging | Nesting |
| V<br><br>(5BS) | Slightly silty | Slow | Vertical on one side, gentle slope (20-40˚) on the other side | Stony | Improved on north bank. Unimproved on south bank | Lots | Slight | None | None | Suitable | Unsuitable |
| VI<br><br>(6 BS) | Slightly silty | Rapid | Gentle Slope (20-40˚) on one side, Vertical on other side | Wet earth | Slightly improved | Lots | No signs | None | None | Limited suitability | Suitable |

| | Description of section/habitat features | | | | | | | Kingfisher signs recorded during surveys | | Section suitable or unsuitable for: | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Section<br>BS – Breeding Survey, AS – Autumn Survey | Water Quality | River Flow | Angle of Bank | Bank Substrate | Bankside Agricultural Improvement | Availability of Overhanging Branches | Level of Disturbance | Kingfisher Sighting | Nest | Foraging | Nesting |
| VII<br>(7 BS) | Slightly silty | Medium | Vertical | Rock | Not improved | No | Regular use | None | None | | Unsuitable |
| VIII<br>(8 BS) | Clear | Medium | Steep Slope (40-80º) | Wet Earth, Vegetated, Gravel | Improved | Some | Slight | None | None | Suitable | Suitable |
| IX<br>(9 BS) | Clear | Medium | Vertical | Rock, Wet earth | Slightly improved | Lots | Slight | None | Possible old nest hole on north bank @ NS 70219 63180 | Suitable | Suitable |
| XI<br>(10 BS) | Slightly Silty | Medium | Steep Slope (40-80º) | Gravel and Stone | Not Improved | Some | Slight | None | None | Suitable | Unsuitable |

| | Description of section/habitat features | | | | | | | Kingfisher signs recorded during surveys | | Section suitable or unsuitable for: | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Section<br><br>BS – Breeding Survey, AS – Autumn Survey | Water Quality | River Flow | Angle of Bank | Bank Substrate | Bankside Agricultural Improvement | Availability of Overhanging Branches | Level of Disturbance | Kingfisher Sighting | Nest | Foraging | Nesting |
| XII<br><br>(11 BS) | Silty | Medium | Vertical | Wet earth | Not improved | Some | Slight | None | None | Suitable | Suitable |
| XIII<br><br>(12 BS) | Polluted | Medium | Vertical | Wet earth | Not improved | No | Slight | 1 at NS71243 62849<br>1 at NS71156 62943 | | Unsuitable | Suitable |
| V<br><br>(1 AS) | Slightly silty | Slow | Vertical on one side and gentle slope (20-40º) on the other side | Stony | Improved on north bank, unimproved on south bank | Lots | Slight | None | None | Suitable | Unsuitable |

| | Description of section/habitat features | | | | | | | Kingfisher signs recorded during surveys | | Section suitable or unsuitable for: | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Section<br>BS – Breeding Survey, AS – Autumn Survey | Water Quality | River Flow | Angle of Bank | Bank Substrate | Bankside Agricultural Improvement | Availability of Overhanging Branches | Level of Disturbance | Kingfisher Sighting | Nest | Foraging | Nesting |
| VI<br>(2 AS) | Silty | Medium | Gentle slope (20-40º) on one side, vertical on the other side | Wet Earth and Rocks | Slightly improved | Lots | No signs | None | None | Limited suitability | Suitable |
| VIII<br>(3 AS) | Clear | Medium | Steep slope (40-80˚) | Wet earth, Vegetated, Gravel | Improved | Some | Slight | None | None | Suitable | Suitable |
| IX<br>(4 AS) | Slightly silty | Medium | Vertical | Rock, Wet earth | Slightly improved | Lots | Slight | None | None | Suitable | Suitable |
| X<br>(5 AS) | Clear | Medium | Vertical | Rock | Not improved | Lots | Slight | None | None | Suitable | Unsuitable |

| | Description of section/habitat features | | | | | | | Kingfisher signs recorded during surveys | | Section suitable or unsuitable for: | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Section<br><br>BS – Breeding Survey, AS – Autumn Survey | Water Quality | River Flow | Angle of Bank | Bank Substrate | Bankside Agricultural Improvement | Availability of Overhanging Branches | Level of Disturbance | Kingfisher Sighting | Nest | Foraging | Nesting |
| XIV<br><br>(6 AS) | Clear | Medium | Gentle slope (20-40˚) | Rock | Not improved | Some | Slight | None | None | Suitable | Unsuitable |
| XV<br><br>(7 AS) | Slightly silty | Medium | Steep Slope (40-80˚) | Vegetated,<br><br>Rock | Not improved | Lots | No signs | None | None | Suitable | Unsuitable |
| XVI<br><br>(8 AS) | Silty | Medium | Steep slope (40-80˚) | Dry earth | Not improved | Lots | Slight | 1 at NS73405 61955 | None | Suitable | Suitable |
| (9 AS) | Silty | Medium | Gentle Slope (20-40º) | Wet earth, Vegetated | Not improved | Lots | None | None | None | Suitable | Suitable |
| (10 AS) | Silty | Medium | Gentle Slope (20-40º) | Wet earth, Vegetated | Not improved | Lots | None | None | None | Suitable | Suitable |

| | Description of section/habitat features | | | | | | | Kingfisher signs recorded during surveys | | Section suitable or unsuitable for: | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Section<br><br>BS – Breeding Survey, AS – Autumn Survey | Water Quality | River Flow | Angle of Bank | Bank Substrate | Bankside Agricultural Improvement | Availability of Overhanging Branches | Level of Disturbance | Kingfisher Sighting | Nest | Foraging | Nesting |
| (11 AS) | Slightly silty | Medium | Gentle Slope (20-40º) | Wet earth, Vegetated | Not improved | Lots | None | None | None | Suitable | Suitable |
| (12 AS) | Slightly silty | Medium | Gentle Slope (20-40º) | Wet earth, Vegetated | Not improved | Lots | None | None | None | Suitable | Suitable |

NB: Roman numerals show which sections were surveyed during both surveys (BS breeding season survey and AS autumn survey) due to repeat numerals.