

**APPENDIX C**

RECONNAISSANCE SURVEY FINDINGS

## INTRODUCTION

Reconnaissance-level surveys were carried out on three of the water bodies in the Nith catchment (River Nith upstream of New Cumnock, Glenesslin Burn/Castramon Burn, and Wanlock Water). The aim of the reconnaissance surveys was to validate the existing data on pressures in these water bodies and to identify any additional pressures.

### RIVER NITH UPSTREAM OF NEW CUMNOCK

The Nith upstream of New Cumnock can be divided into three broad sections based on morphological characteristics and pressures (Figure C4). The downstream-most section is between New Cumnock and Dalricket Mill. SEPA's morphological pressures database indicates that the river downstream of the minor road bridge near Ford Mouth is affected by embankments and set back embankments. The reconnaissance survey confirmed the presence of embankments in this section (Figure C1). Reach type was passive meandering (type F), becoming active meandering (type D) and then plane-riffle (type C) further upstream. Rates of bank erosion increased upstream, with bank protection becoming increasingly prevalent upstream in relation to this (Figure C1). Minor stock pressure on banks was also observed. Upstream of the minor road bridge the valley becomes more confined with increased incidences of hillslope erosion. Embankments were observed to be minor and intermittent upstream of the minor road bridge and are not recorded in SEPA's morphological pressures database.

The central section of the water body is between Dalricket Mill and the southwestern extent of the mine workings. This section of the river has been severely impacted by open-cast mining. The river has been realigned twice in order to allow mining within its valley (Figure C1). This is recorded in SEPA's morphological pressures database as an approximately 3 km long reach of high impact realignment. Access to this reach was not possible during the reconnaissance visit because of restrictions in relation to the mining operations. However, the realignment of this section of river has been documented elsewhere. Given the large scale of the realignment works in this section of river, and the fact that this work is being overseen by SEPA already, the pressures are not considered further within the appraisal of restoration options on the Nith undertaken in this study.

The upper section of the water body extends upstream from the boundary of the mine workings. No pressures are recorded within SEPA's morphological pressures database for this section. The reconnaissance survey also found little evidence of morphological pressure. The river through the downstream part of this section (downstream of the B741 bridge) is typically plane-riffle or active meandering, becoming steeper upstream of the bridge with wandering sections interspersed with plane bed or step-pool reaches. Throughout the section there was evidence of high rates of morphological activity. Frequent bank and terrace erosion, bar deposition and evidence of avulsions were observed (Figure C1). Land use throughout much of the section was commercial forestry. However, trees were typically more than two metres back from top of bank and are therefore not considered to be impacting on the channel (based on the rules/assumptions used in MImAS).



**Figure C1 Nith upstream of New Cumnock – A: embanked channel near New Cumnock; B: bank protection in downstream part of water body; C: realigned reach through mining area; D: active upstream section with forestry.**

#### **GLENESLIN BURN/CASTRAMON BURN**

Morphological pressures for this water body within SEPA's morphological pressures database are restricted to several bridges. The reconnaissance survey indicated the presence of additional pressures. Embankments were found intermittently between approximately NX 805 841 (near Whiteside) and NX 836 843 (near Milton) (Figure C2, C5). Evidence of high impact realignment was also observed in some locations within this extent.

Reach type for almost all of the water body was plane-riffle, becomes active meandering close to its confluence with Cairn Water. Point bar development and bank erosion were observed within the active meandering reach (around NX 850 833) and some extents of boulder bank protection were also located here (Figure C5).



**Figure C2 Glenesslin Burn – Embanked and possibly realigned channel in central part of water body.**

### **WANLOCK WATER**

SEPA's morphological pressures database includes only bridges and fords for Wanlock Water. The reconnaissance visit indicated significant pressures on the upstream part of the water body, around Wanlockhead (Figure C6), associated with former lead mining in the valley. These are described below.

- Upstream of the village the channel was a step-pool type within an incised valley. There were minor impacts from gabion bank protection associated with an adjacent footpath and footbridges.
- The burn flowed through a culvert beneath the road through Wanlockhead and a short open culverted section then led to a second closed culvert.
- Downstream of here the reach type became plane riffle. The burn had been realigned to the left hand side of the valley (high impact realignment) and embanked on its right bank (Figure C3). (There appeared to be some recent alteration to the upstream end of the embankment.) Further downstream the burn had been diverted around the valley side (Figure C3).
- At the time of visit (during low flow) the entire flow in the burn was observed to seep into the bed at around NS 869 132, with the channel downstream being completely dry. However, the presence of exposed, unvegetated gravel in the dry channel suggests that it becomes active during high flows.
- Much of the dry channel downstream was an open culvert (Figure C3). The channel remained dry for approximately 500 m until a significant input of flow from a tributary. The origin of the tributary was unclear as the flow emerged from a subsurface channel in a hillslope on the left side of the valley.
- Downstream of the tributary input was a further section of high impact realignment for about 400 m (ending at NS 854 143), through old mine spoil (Figure C3).
- Downstream of this point the reach type became active meandering and not directly impacted by morphological pressures, other than riparian vegetation loss. Evidence of possible minor dredging and a minor weir were observed close to the downstream extent of the water body.



Figure C3 Wanlock Water – A: recently modified embankment; B: upper realigned section; C: dry, open culvert channel; D: lower realigned section through mine spoil.









