



West Lothian Council

COUNCIL EXECUTIVE

LINLITHGOW LOCH CATCHMENT MANAGEMENT ACTION PLAN

REPORT BY HEAD OF PLANNING & ECONOMIC DEVELOPMENT & HEAD OF OPERATIONAL SERVICES

A. PURPOSE OF REPORT

The purpose of this report is to inform the executive about the ongoing work undertaken by the Linlithgow Loch Catchment Management Group, highlight the results of two recent academic studies commissioned to examine the quality of water in the Loch and consider the potential way forward.

B. RECOMMENDATION

It is recommended that the executive notes:

- the updates on the two recent studies relating to Linlithgow Loch; and
- the Environment PDSP consideration that the potential formation of a charitable Trust would be effective in promoting improvements in water quality and the environment of the Loch and officers will report back on the legal and fundraising potential of such a Trust.

C. SUMMARY OF IMPLICATIONS

I Council Values	Working in partnership, focusing on our customers' needs and making best use of our resources.
II Policy and Legal (including SEA, Equality Issues, Health or Risk Assessment)	Policy: West Lothian Local Plan policy ENV 4 supports the protection of Linlithgow Loch, as it is a Site of Special Scientific Interest (SSSI). The Flood Risk Management (Scotland) Act 2009 requires local authorities to exercise their powers with a view to reducing overall flood risk. The Water Environment & Water Services Act 2003 requires local authorities to carry out their statutory duties in a way which adheres to the principles of the European Water Framework Directive. The Nature Conservation (Scotland) Act 2004 places a duty on public bodies to further biodiversity. The Scottish Biodiversity Strategy identifies the role of local authorities in meeting national species and habitat priorities. The Local Biodiversity Action Plan is supported in the adopted West Lothian Local Plan.
III Resources - Financial	None – consider whether establishing a

Staffing and Property

charitable Trust might be an appropriate way to secure funds to carry out water quality and other environmental improvements in and around the loch. The loch is owned by Historic Scotland.

IV Consultations

Operational Services: Flood Risk Management Team; Planning & Economic Development Service: Environmental Health. Environment Policy Development & Scrutiny Panel 2 June 2011.

D. TERMS OF REPORT

1.0 Introduction

1.1 Linlithgow Loch was formed from a block of ice left behind by retreating glaciers at the end of the last Ice Age. It is one of only two remaining natural lowland lochs in the Lothians and provides the setting for Linlithgow Palace. It is also a key part of the tourist destination experience and is well used by local residents for recreation. It supports water sports and a fishing club.

1.2 It is designated a Site of Special Scientific Interest (SSSI) by Scottish Natural Heritage for its botanical interests that are characteristic of a naturally eutrophic loch and is owned and administered by Historic Scotland.

1.3 However, in recent years the appearance of a seasonal blue / green algal bloom on the surface of the Loch had lead to concerns about potential public health issues and about the serious deterioration in water quality that has led to the formation of the blooms.

2.0 Linlithgow Loch Catchment Management Group (LLCMG)

2.1 A working group of stakeholders was established c2000 initially to tackle the algal bloom issue and to provide a forum to allow environmental issues related to the Loch to be explored. The group was based on a similar organisation covering Loch Leven, which also experienced water quality issues, albeit on a larger scale.

2.2 The group meets quarterly and consists of the following stakeholder organisations:

- West Lothian Council (Flood Risk, Planning, Environmental Health Services);
- Scottish Environment Protection Agency (Ecologist / Area Officer);
- Historic Scotland (Area Manager / Rangers);
- Scottish Natural Heritage;
- Scottish Water;
- Forth Area Federation of Anglers;
- The Natural Environment Research Council Centre (NERC) for Ecology & Hydrology; and
- Scottish Agricultural College.

2.3 While the group was previously chaired by SEPA, it is now chaired and administered by council officers. Appendix 1 shows the boundary of the loch catchment.

3.0 Two recent academic studies on Linlithgow Loch

3.1 In 2010, the LLCMG commissioned two wide ranging studies to look at water quality and catchment management issues, as well as the wider catchment and potential for nutrients that cause the algal bloom to enter the water body. They both reported in March 2011.

3.2 ***“An assessment of water quality and management requirements at Linlithgow Loch”*** was undertaken by the Natural Environment Research Council - Centre for Ecology & Hydrology.

3.3

The aim of this study was to:

- 1) compile and review available data and reports on the loch;
- 2) summarise or propose water quality targets for the loch;
- 3) assess long term water quality data against targets;
- 4) investigate nutrient (especially Phosphorous that encourages the algal bloom transformation processes within the loch); and
- 5) suggest future management solutions.

3.4 While the scientific report goes into detail on the complex chemistry of the loch, the main findings were:

- a) the status of the macrophyte (i.e. aquatic plants) community has improved;
- b) nitrogen availability limits algal bloom biomass in the summer;
- c) chlorophyll concentrations are increasing;
- d) internal phosphorous release is significant in the summer months; and
- e) routine monitoring of the loch’s wider catchment loading is required.

3.5 An associated study on ***“Linlithgow Loch external nutrient loading”*** was undertaken by Scottish Agricultural College (SAC). As it had been assumed that phosphorous pollution is the main cause of elevated algal biomass in the loch, alongside nitrogen and that these nutrients enter the loch from a variety of sources in the surrounding catchment, SAC was commissioned to assess the potential recent external nutrient loading and compile a risk analysis against the sources identified. (See Appendix 2: Risk Matrix)

3.6 The study also assessed the:

- available data from Scottish Water and WLC on nitrogen and phosphorous loadings entering the loch, including assessing the town drainage plan;
- effects of agricultural practices - through interviews with farmers;
- potential for soil erosion depending on soil type, cropping and cultivation techniques;
- effects of the amenity sector from run-off from non-agricultural sources;
- effects of light industry in the catchment; and
- impacts of other factors such as birds, the canal, motorway and railway drainage.

3.7 The report demonstrates the variety of sources of nutrients in what is a very complex catchment. A list of actions were identified that could be undertaken to reduce the risks of nutrients entering Linlithgow Loch.

3.8 The importance of awareness-raising amongst farmers, householders and the general public is considered a main priority. Reduction of external nutrient loading will only be achievable if all the community acts together.

4.0 Linlithgow Loch Flood Risk Management issues

- 4.1 The council also commissioned the Centre for Ecology & Hydrology through their sub-consultants, Wallingford Hydro Solutions, to undertake a study of the catchment to determine the extent of flood risk in so far as it has the potential to affect the built environment. The findings are provisional due to uncertainties because the catchment is not gauged and the data is therefore uncalibrated.
- 4.2 Flows from the Loch are also controlled by a complex series of trash screens, a weir, a sluice and a culvert, which are difficult to replicate accurately in a hydraulic model. There are therefore uncertainties, which need to be ironed-out before flood risk assessments can be finalised.

5.0 Symposium

- 5.1 In March 2011, the Natural Environment Research Council Centre for Ecology & Hydrology organised a symposium among the existing catchment management partners and consultants, to “provide a forum for the dissemination and synthesis of current and recent research and to set out roles and responsibilities at Linlithgow Loch”.
- 5.2 The key output of the workshop was a number of management priorities. These are:
- 1) increase public awareness of the environmental issues facing the Loch;
 - 2) conduct nutrient source apportionment in the catchment area;
 - 3) monitor hydrology of inflowing streams;
 - 4) manage water outflow to reduce flood risk;
 - 5) investigate macrophyte / waterfowl interactions and management;
 - 6) assess options for controlling internal phosphorous loads within the loch;
 - 7) secure funding to undertake the management solutions identified;
 - 8) assess the ecological impacts of fish stocking;
 - 9) improve the accuracy of flood risk data using monitoring data; and
 - 10) conduct a cost / benefit analysis on a wide range of management options.
- 5.3 Indeed, in relation to priority 3, Scottish Agricultural College, on behalf of the management group partners, is submitting an application to the Central Scotland Green Network (CSGN) for “monitoring stream inflow and also engaging with the local community” about the loch’s plight. Grants awards are known in July 2011 for implementation by March 2012. Further grant applications related to work in the wider rural catchment are under consideration.

6.0 “Yellow Fish” Campaign

- 6.1 Alongside the on-going research work, Historic Scotland’s Ranger Service has recently led on an environmental awareness-raising campaign with local school children called “Yellow Fish”. Springfield Primary were the pilot school and among the various tasks the Rangers undertook with the school children was painting “yellow fish” identification logos beside drains in the Springfield Estate to warn against inappropriate disposals down road drains and to highlight the correlation between what goes down the drain and the impact on the loch.
- 6.2 There is scope to roll out the campaign to other primary schools in Linlithgow and involve the Academy in future years.

7.0 Future issues and way forward – establishment of a charitable Trust

- 7.1 There are several issues related to progressing improvements to the water quality and the general environment of Linlithgow Loch. These relate to finance and awareness-raising.

Finance

- 7.2 Any future funding from West Lothian Council at a sufficient level to fund substantial works to improve water quality would need to be considered against priorities at the time. SEPA investment is under review and Scottish Water's Quality & Standards 3 investment programme is currently committed until 2015/16. Historic Scotland continues to provide a ranger service for the Peel and the environs of the Loch. Scottish Natural Heritage will continue to monitor the condition of the SSSI, but cannot guarantee funding for improvements.
- 7.3 There might be scope for a charitable trust to be established that could draw together interested parties currently within the Catchment Management Group, but also include elected members and public representatives and other relevant organisations. The remit of the trust would be to engage with local people and visitors and to work with others to secure funding to improve water quality and the environment of the loch and to oversee implementation.
- 7.4 This would be brought together in the preparation of a long-term 20-year Linlithgow Loch Catchment Management Action Plan similar to that successfully undertaken at Loch Leven.
- 7.5 There is an existing Linlithgow Loch User's Committee administered by Historic Scotland that covers the recreational aspects of the Loch. It is envisaged that this would continue.
- 7.6 Officers could investigate the potential for a Linlithgow Loch Trust, consult with existing stakeholders and report back to the panel and Council Executive identifying if there is merit in formally establishing a Trust and the council becoming involved.

Awareness raising

- 7.7 Following the success of the recent symposium organised by Edinburgh University, there may be merit in running a similar meeting and / or exhibition in the refurbished Burgh Halls or Linlithgow Library to inform local residents, relevant groups and the wider general public within the town and hear their ideas for improvement.
- 7.8 This could include such groups as Linlithgow and Linlithgow Bridge Community Council, Burgh Beautiful, Transition Linlithgow and the Town Centre Management Group and various other local organisations, such as the Low Port Centre and Linlithgow Business Association.
- 7.9 In addition, there are two other important issues. The loch is valuable as an important magnet for tourism and associated economic activity as well as contributing to the appearance of Linlithgow.
- 7.10 Finally, there is the impact of the declining quality of the loch on submerged and marginal species and the knock-on effects on waterfowl and other species that depend on the loch and contribute to its statutory protected status. These factors also have an impact on users of the loch such as the Low Port Centre and anglers.

E. CONCLUSION

Linlithgow Loch is an important asset to the town and to West Lothian generally. However, its location, previous uses and a complex series of interrelated issues have affected the water quality of the loch.

Linlithgow Loch Catchment Management Group has been working to better understand these issues and where possible progress improvements. After the completion of recent academic studies, now may be the time to establish a more formal vehicle, such as a 'Linlithgow Loch Trust', dedicated to raising awareness and securing funds to improve water quality of the general environment of the Loch and its catchment. The outcome of these investigations will be reported back to committee.

F. BACKGROUND REFERENCES –

- 1) *"An assessment of water quality and management requirements at Linlithgow Loch"* - Edinburgh University Centre for Ecology & Hydrology, March 2011
- 2) *"Linlithgow Loch external nutrient loading"* - Scottish Agricultural College, March 2011
- 3) *Linlithgow Loch & Mill Burn Flood Study – Phase 1* – Wallingford Hydro Solutions, December 2010

Appendices / Attachments: 1) Plan of Linlithgow Loch catchment boundary.

2) Risk matrix from SAC report.

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