



# **Biodiversity Lochs Environmental Improvement Action Plan**

**James Davidson, SEPA**

# Key Drivers

- SEPA = UK lead for mesotrophic lakes HAP
- WFD need to achieve good ecological status
- Nature Conservation (Scotland) Act

# Key pressures on lochs

- Diffuse pollution – nutrient enrichment (particularly P)
- Non-native invasive species



NZ Pygmyweed (*Crassula helmsii*)



# Biodiversity lochs

## Environmental Improvement Action Plan

- SEPA produces loch EIAPs to support partnership projects to compliment regulatory work.
- National Biodiversity lochs EIAP 2008 to 2011– 31 lochs, recorded presence of BAP priority species which are under threat of decline.
- Focus on catchment pressures

# Approach

- SEPA to instigate and support local loch partnerships
- Characterise and monitor pressures in catchment / loch
- Work in partnership to pursue projects which:  
address pressures → improve ecological  
status → safeguard populations of priority  
plants

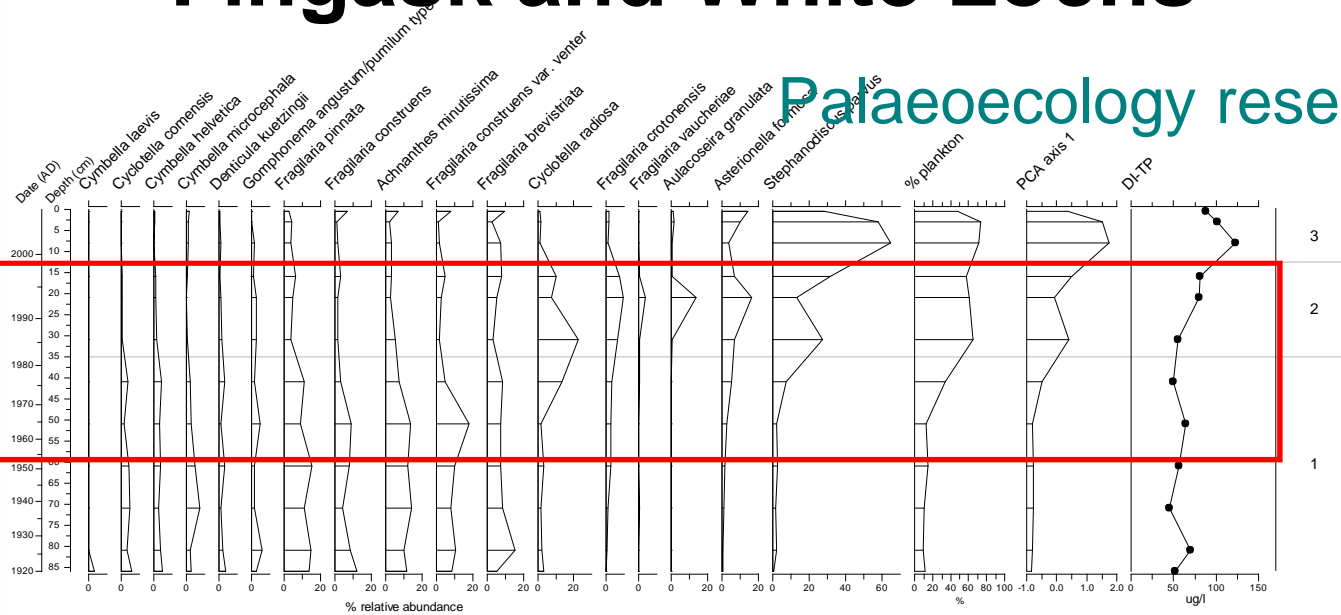
# Fingask & White Lochs, Tayside



- Small lochs <12 ha, flora indicative of mesotrophic status
- Records biodiversity priority species: slender naiad, Shetland pondweed, rough stonewort and bristly stonewort
- V small populations, nutrient enrichment, cyanobacterial blooms in recent years
- WFD TP classification = moderate status

# Fingask and White Lochs

## Palaeoecology research



White Loch formerly supported diatom and Cladocera communities typical of a mesotrophic loch

These have both undergone changes associated with enrichment most notably since ~1970.



# Fingask and White Lochs



Tayside lochs partnership established 2008

Tayside biodiversity funding (SITA) – diffuse pollution audit of farms, soil nutrient budgets, advice to landowners, buffer strips around both lochs.

Partners – FWAG, Tayside LBAP, Blairgowrie Angling Association, Kindrogan Field Studies Centre, Rosemount Golf Club, SNH, SEPA.





# Fingask and White Lochs



SEPA - review operation of a CSO, advice to householders on septic tanks (registration); slurry drainage, also continued water quality monitoring, macrophyte surveys.

## Tea Towel 'make the link to your sink'

To raise awareness of the problems of elevated phosphorus levels in freshwater and how local action can help

# Lindores Loch

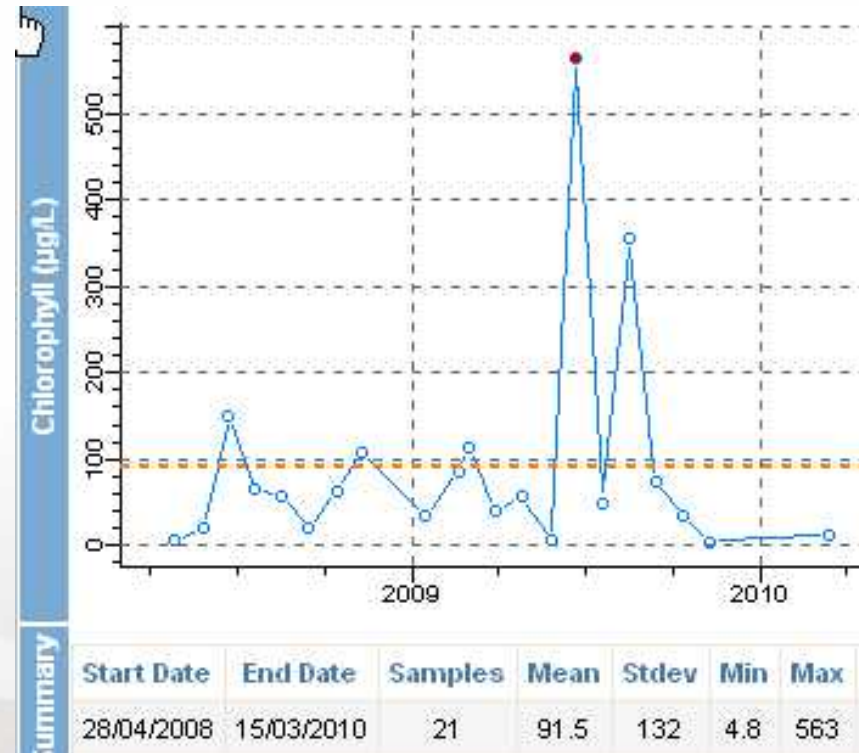
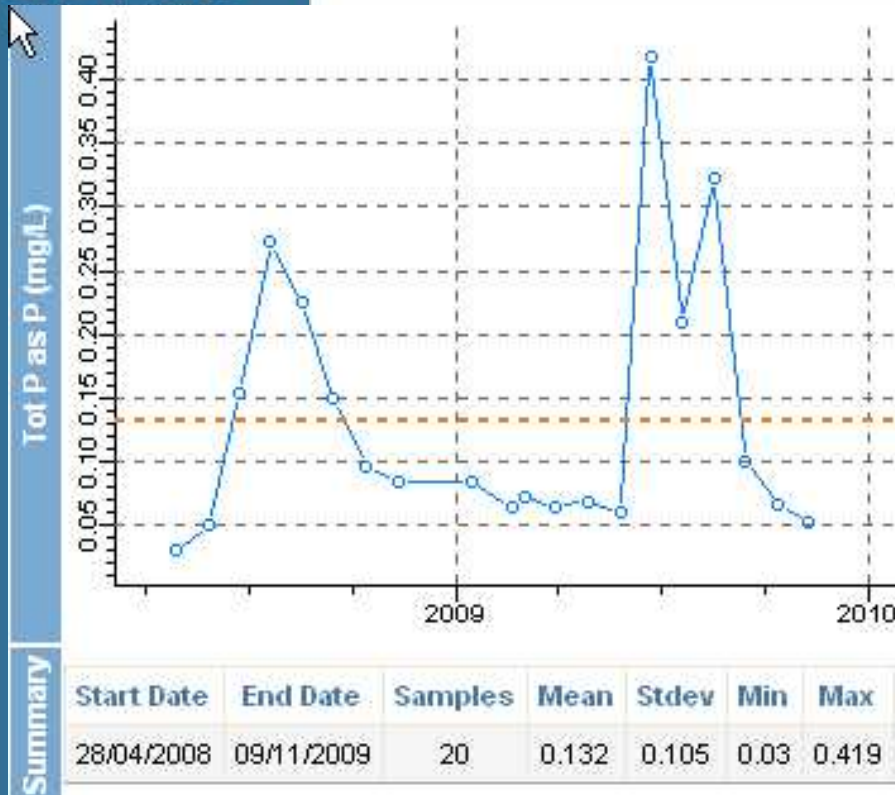


40.5 ha, shallow lowland mesotrophic loch, near Newburgh

Extensive charophyte beds, largest number of *Potamogeton* species of any open water site in Fife. Formerly supported slender naiad.

Extensive freshwater mire, adjoining rich-fen and alder willow carr

# Lindores Loch



SSSI mesotrophic loch feature – unfavourable no change

SEPA water chemistry data indicating nutrient rich conditions and v high algal biomass.

WFD TP classification = Bad status

## Lindores, Fife

- Palaeoecological evidence of enrichment most notably ~1970. Loch far removed from its reference.
- Zooplankton records suggest fish predation played role in maintaining high productivity = further fish stocking not recommended.
- Lindores Partnership established 2008 – aim to prevent further enrichment.
- SEPA investigates loch siltation, diffuse pollution sources. Initiating catchment management plan.

# Lindores, Fife

DP modelling

Indicates likely  
diffuse pollution  
sources and  
hotspots.

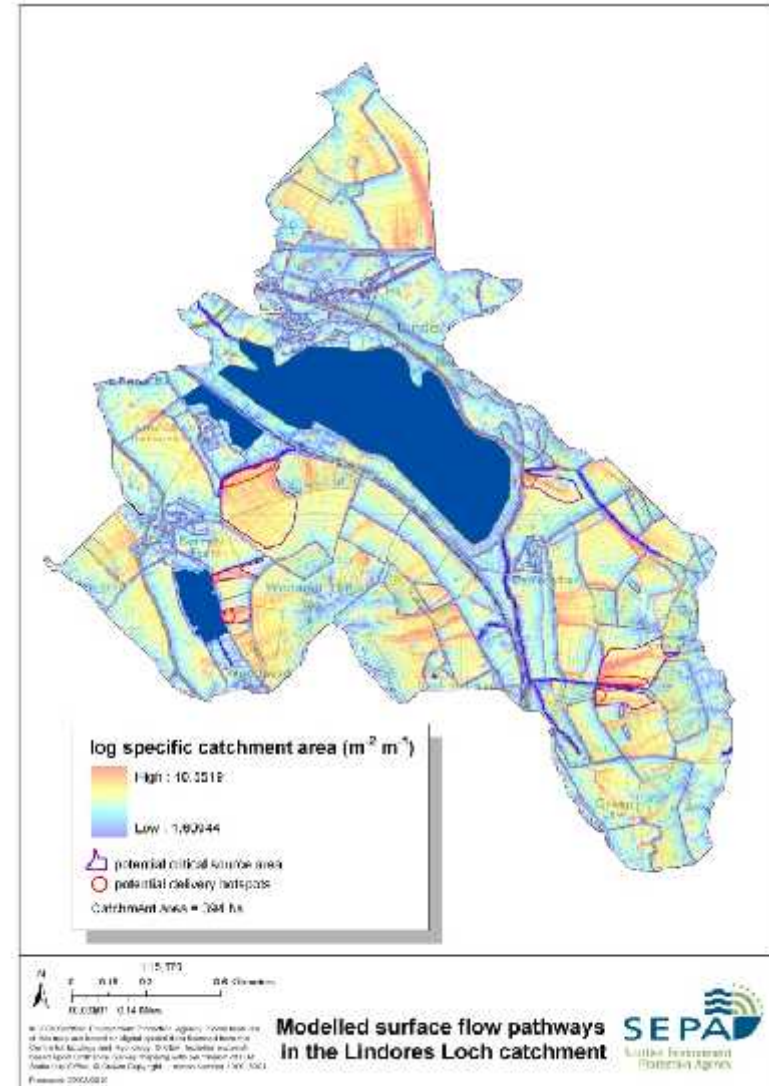
Uses:

Land use/cover

Topography

Drainage network

boundaries



# Outcomes / benefits

- Loch improvements take time
- SEPA provides impetus to start up and science support + monitoring
- Local partnerships become 'face' of works = landowner buy-in increased. Compliments regulation
- Carrot not stick approach (inc. searching for funding). Positive, pro-active.
- Important national elements – paleolimnology, invasives