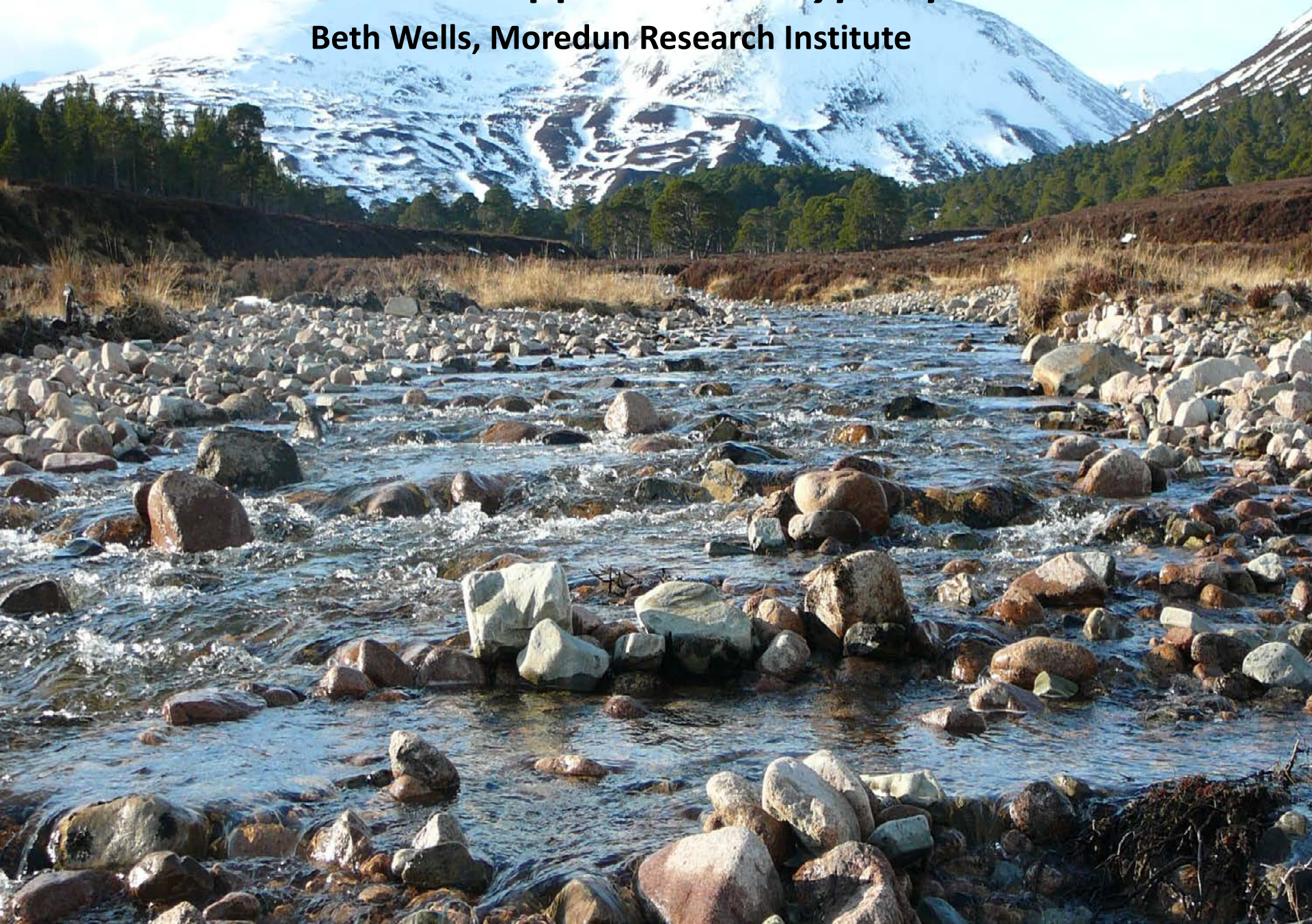


A whole catchment approach to *Cryptosporidium* control

Beth Wells, Moredun Research Institute



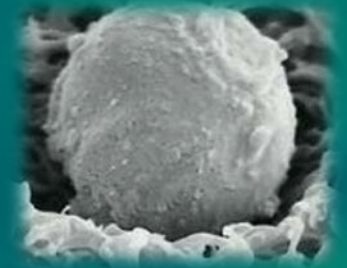
Cryptosporidium

Cryptosporidium is an environmentally ubiquitous protozoan parasite

Of particular public health concern is *C. parvum* - a zoonotic species infecting livestock, humans and wildlife

Problems for control include:

- Environmentally stable oocysts
- Low infectious dose and ability to multiply rapidly in the host
- Host can shed huge numbers of oocysts
- Oocysts resistant to many common disinfectants including **water chlorination**



The problem.....

Water is considered an important mechanism in the transmission of *Cryptosporidium*

This is particularly important where livestock have access to water courses

The *Cryptosporidium* (Scottish Water) Directive 2003: risk assessments for all public water supplies for *Cryptosporidium* was carried out and testing regimes implemented to monitor each supply according to the risk level



The problem: Public water supply at Tomnavoulin, Glenlivet being continually contaminated by *Cryptosporidium* oocysts resulting in public health risks.

Collaborators: Moredun Research Institute, Scottish Water and The Crown Estate

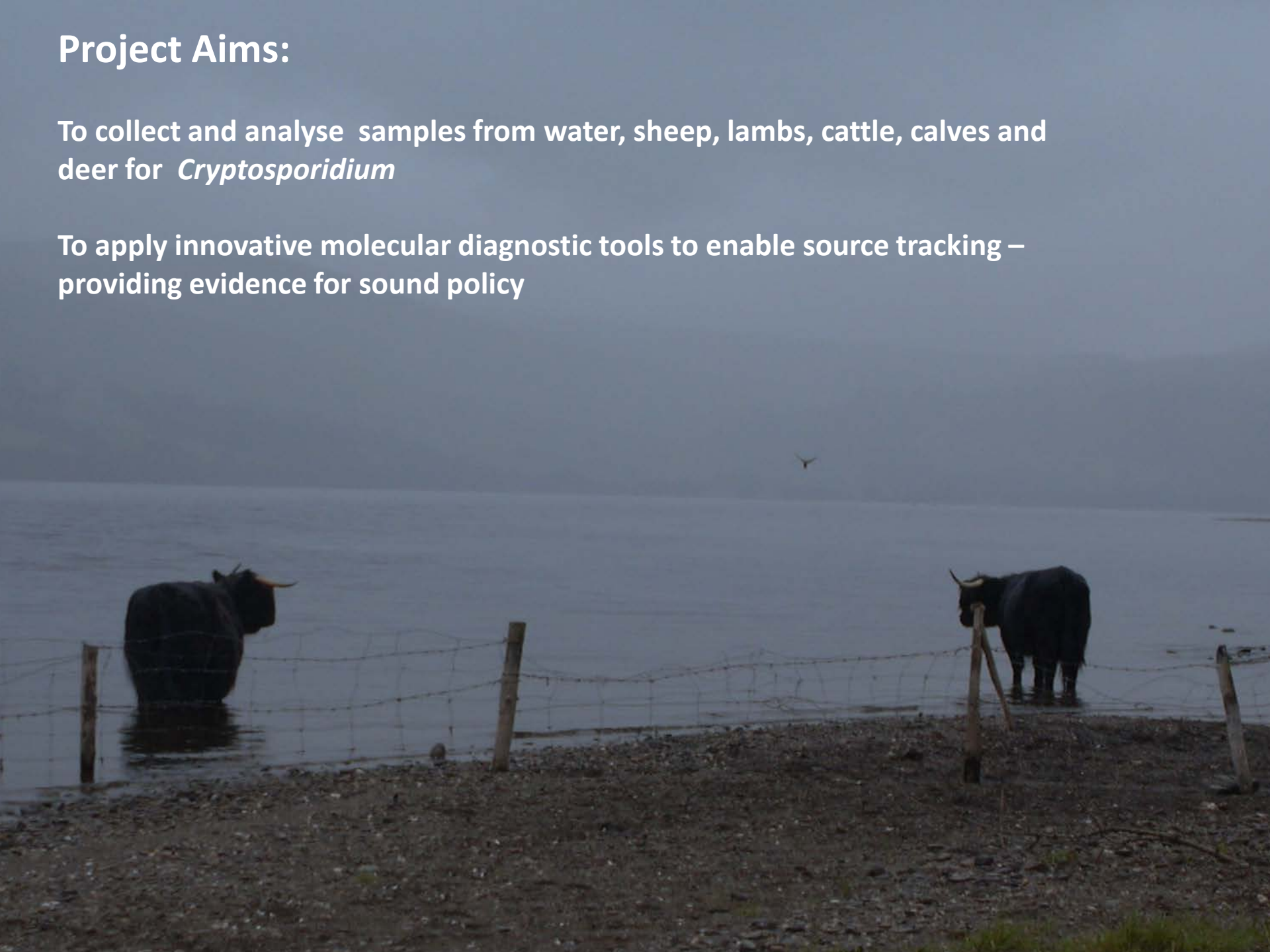
Transmission of *Cryptosporidium* oocysts in catchments



Project Aims:

To collect and analyse samples from water, sheep, lambs, cattle, calves and deer for *Cryptosporidium*

To apply innovative molecular diagnostic tools to enable source tracking – providing evidence for sound policy



C. parvum prevalence : farms and red deer tested

33%
n=6



70%
n=20



Water: *C. parvum*
detected at each site

63%
n=57



80%
n=30



Genotyping *C. parvum*:
Molecular tool allowing
tracking of parasite
transmission routes

69%
n=23



22%
n=47



Project outputs

1. Improved land management: PES

- Fencing, riparian woodland creation and grazing management
- Provision of water troughs for livestock



2. Knowledge Exchange:

- Meetings with Scottish Water Catchment Officers – improving understanding and dialogue
- Management advice to farmers and vets – reduction of *Cryptosporidium* prevalence



IMPACT: Did the water supply improvements have any effect on water quality?

Historical data from Scottish Water shows:

- In the **two years** following water supply improvements at Tomnavoulin - one final water crypto positive and two raw water positives
- In the **6 months** before the improvements there were 21 raw water positives and 16 final water positives



Land management decisions and disease control

- Land management decisions may adversely affect livestock and public health
- These decisions should be:
 1. Investigated before they are implemented
 2. Based on scientific evidence
 3. Involve collaborative discussions representing all interests



Future catchment work in collaboration with SRUC, Stirling University, Scottish Water and CEH



Thank you for listening



AQUA VALENS



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