# Gold as an indicator mineral and integration with other geochemical techniques

## Session 2

1. Site selection for gold collection and specialised field approaches
2. Sampling methodologies (HMC)

Short break

3. Case study in SE Ireland Caledonides : integrated sediment geochemistry (fines and HMC) with gold particle studies
4. Critique of methodology
5. Future directions
   Gold composition studies
   Integrated approaches

# Site selection for gold collection and specialised field approaches

# Key factors in choosing a site to test


Placer miners- mine everything


We don’t have that luxury ….

# Approaches to collecting gold particles

## Field geologist's approach

Very similar to sediment sampling

## Amateur gold panners

Targeted approach using bespoke tools- aim to maximise efficiency of collection as much gold as possible

# Collecting gold for scientific study

Need populations of gold particles to characterize a sample population - for all the reasons dictated by the nature of gold

Many gold studies constrained because researchers rely on either museum samples or donations

Adopt approach used by amateur panners, (or at least the sensible ones…)

Rationale: We often want to collect a sample population in an area where gold particles are  scarce. Techniques used to maximise gold collection from gold-bearing rivers are equally applicable to areas where abundance is low

## Which means what?

Developing approaches based on the specific behaviour of gold particles within the sedimentary environment

# The panning process: good and bad practice

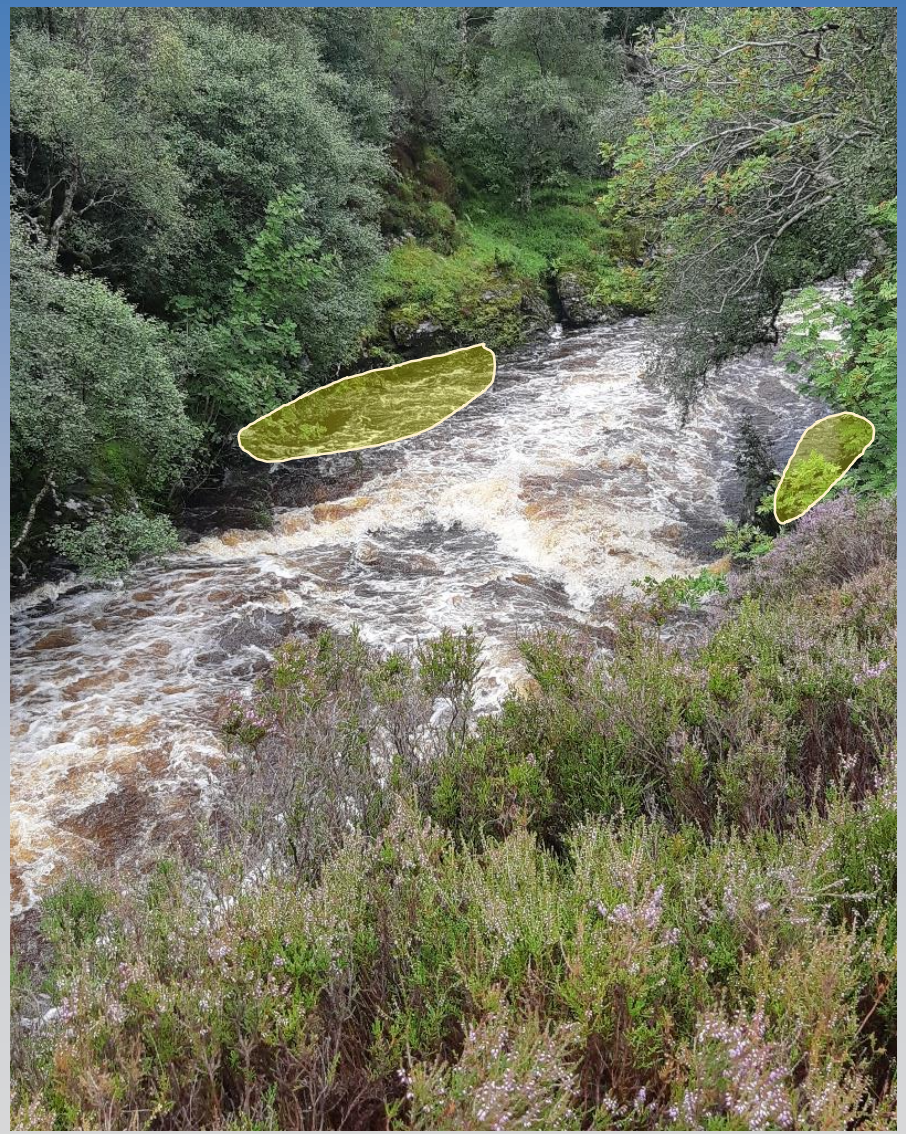
Video 2.1.1

# Targeting concentrations of gold in fluvial systems

Quite often we collect samples in the summer months when a target may look like this:

This setting has little resemblance to the conditions where gold particles may be mobile…

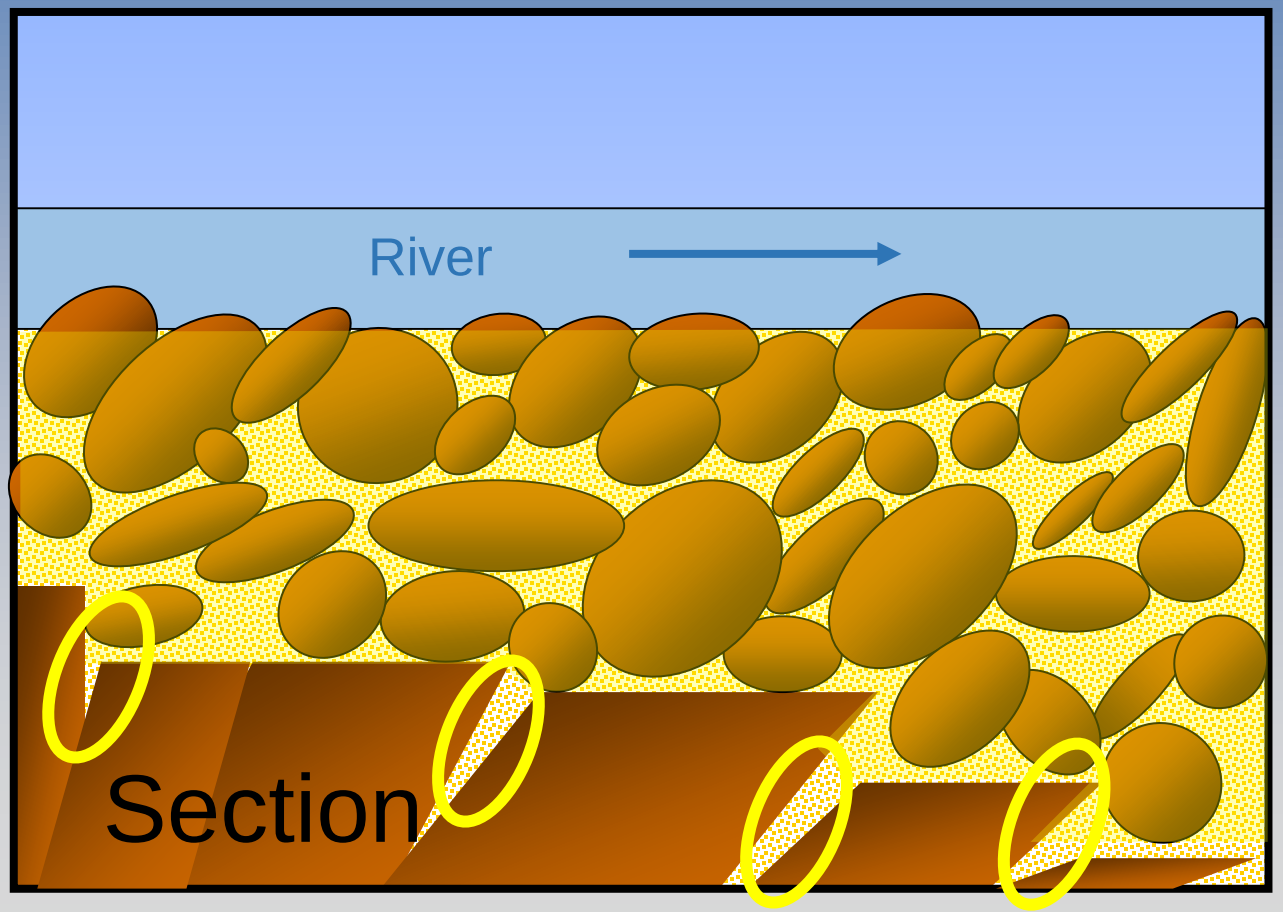
# A 3-dimensional problem…



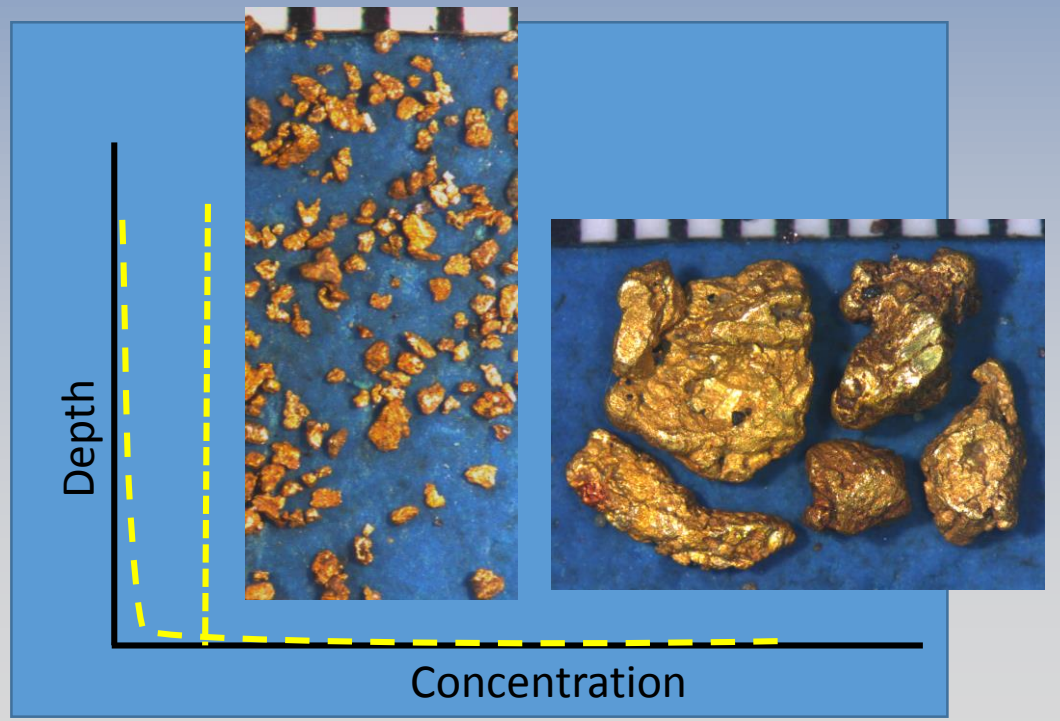
A 2D fix only helps so much….

# Strategies for gold seeking

The problem is predicting the nature of the 3rd dimension: how much do we need to dig before accessing the gold bearing layer?




Gold abundance is a function of both size and sedimentary setting



# Deposition zones in different types of rivers

Video 2.1.2

# Which setting have I missed….


Ones common in Finland:

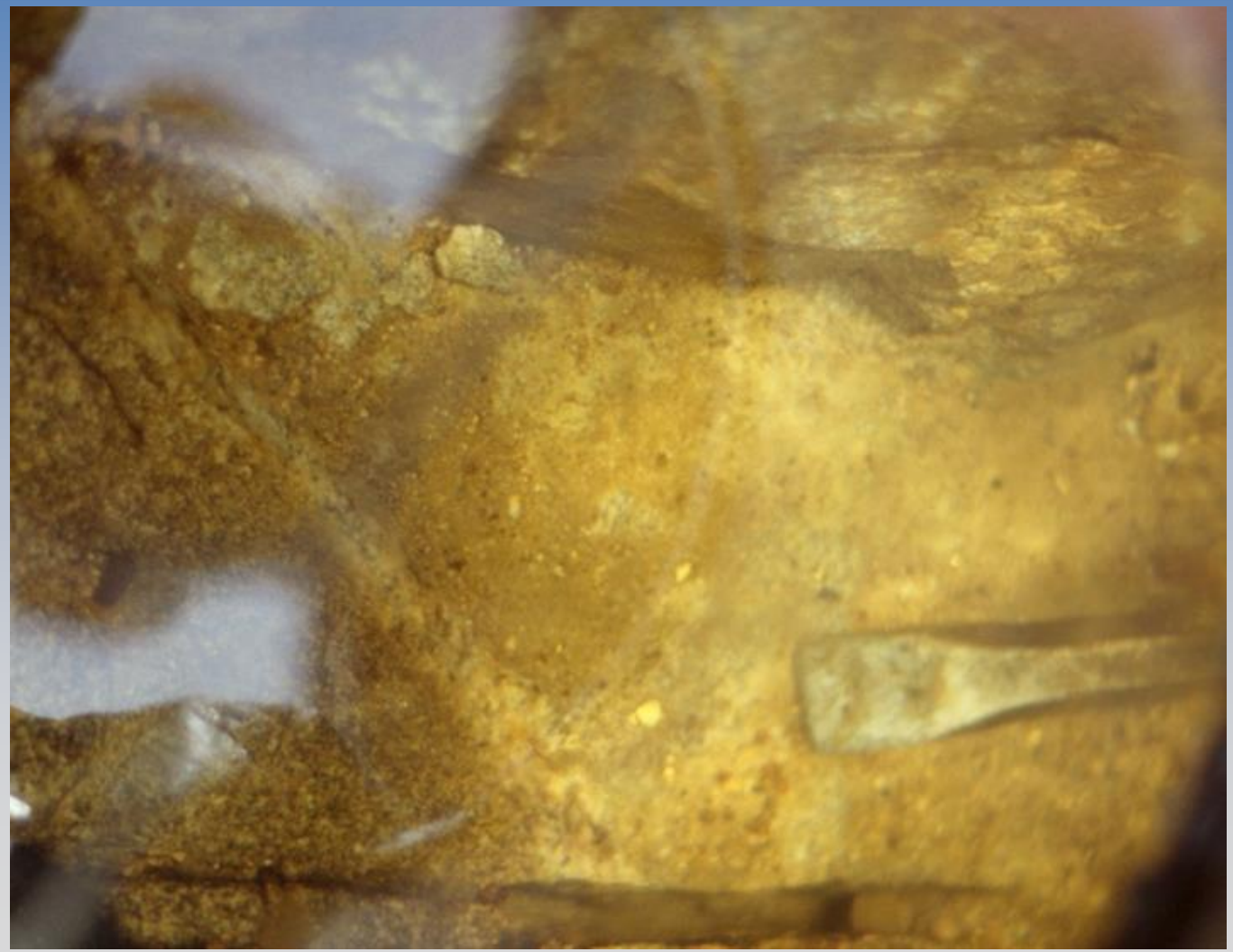
Low gradient

No bedrock

# What specialized tools have evolved to help us to overcome some obstacles?

## Collecting gold underwater from uneven surfaces

# Targeting gold-rich gravel



# Recovering gold from bedrock cracks

Video 2.1.3

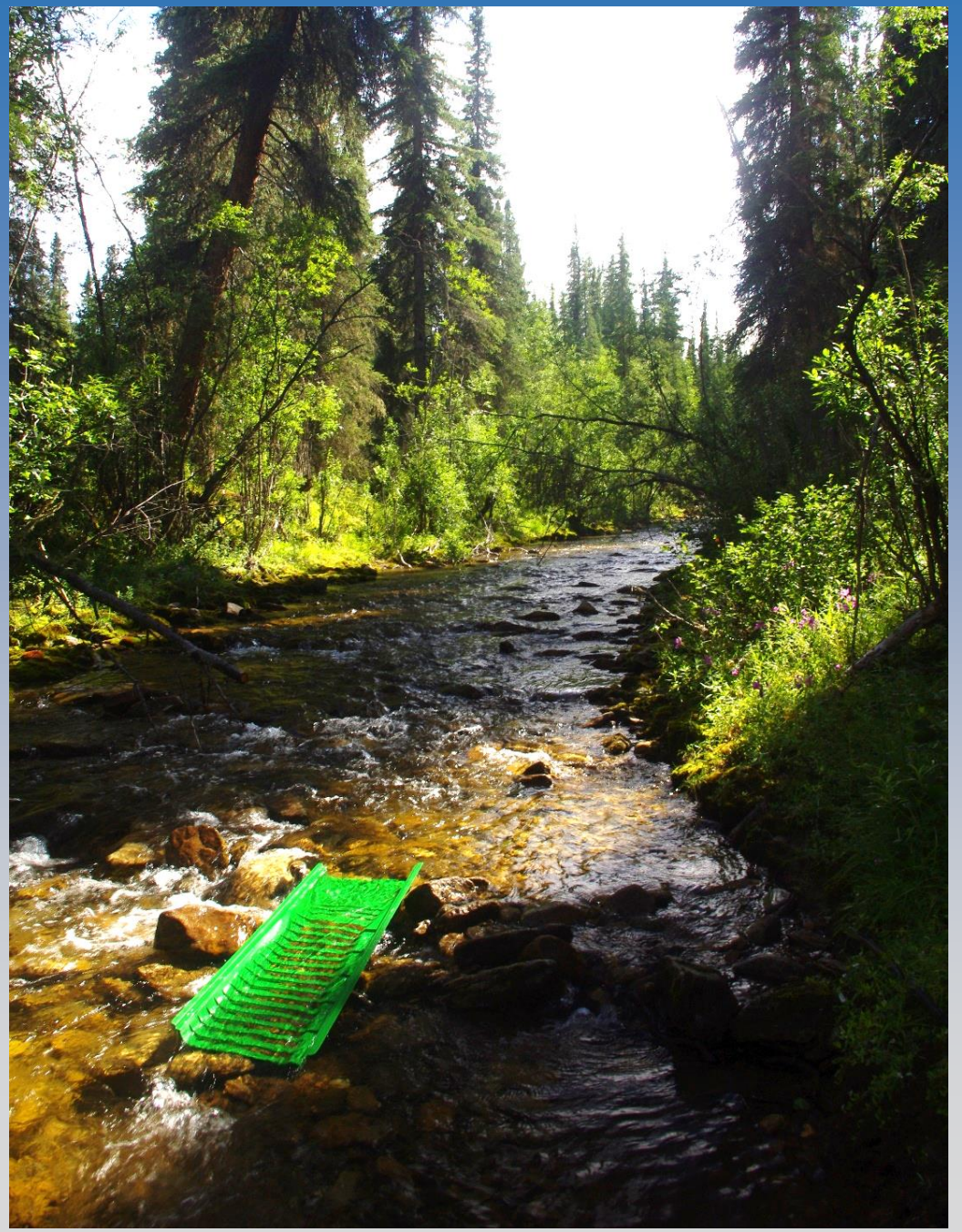
# More gravel faster…

Sluices : allow processing of larger volumes of material than panning.

Right:  typical example:

- No bedrock,
- inside of bend,
- low concentration of gold-
- need to process as much as possible.

(here shovels are better than pumps!)



# Sluicing

Video 2.1.4

# In summary

An understanding of the effects of fluvial sedimentology is really important for efficient gold collection

We have to work out where gold may be found in sediment: a 3D problem

Those considerations include the particle size of gold present

Different approaches to gold collection in the field accommodate all these factors

Record sedimentary setting: provides a context for interpreting results