

**Regulatory Update**  
*Area Based Ecology Environmental  
Standard- Salmon Farming  
Switching From Traditional Taxonomy to  
DNA Based Analysis of Bacteria*

# Outline

Background to method

Implementation

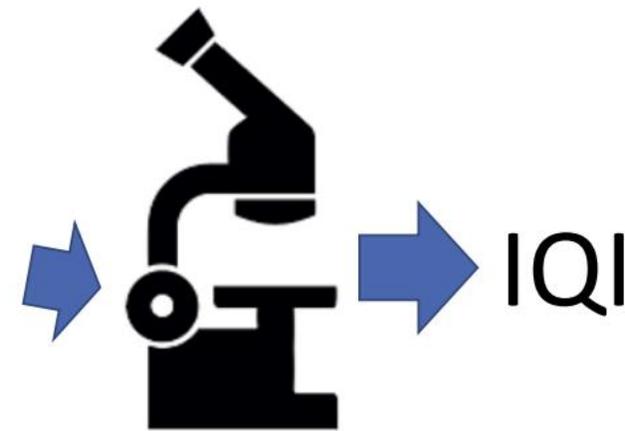
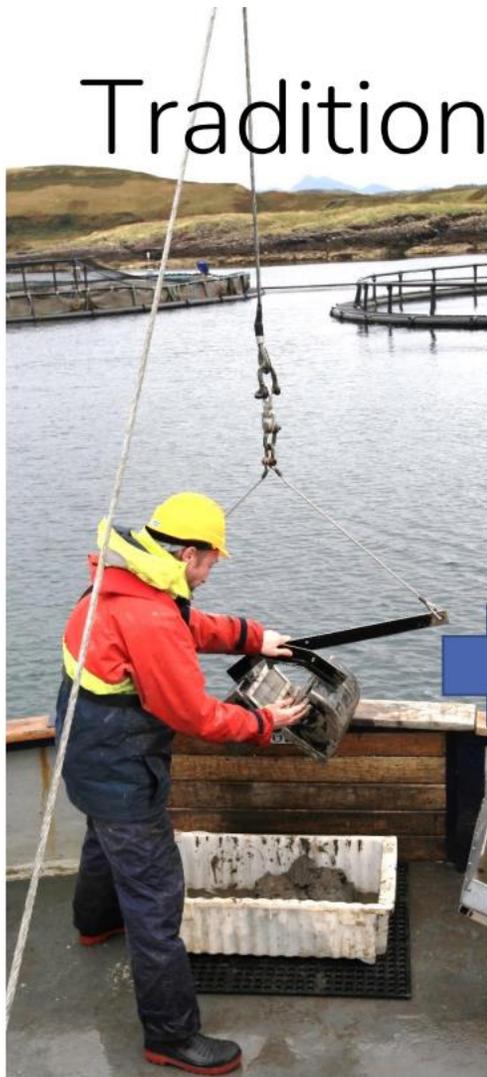
Questions

# Meiometbar/1.5

- Collaborative project between industry, SEPA and the R&D community.
- Meiometbar was a proof of concept study
- Meiometbar 1.5- improved outputs and made suitable for a regulatory screening tool.
- BACTMETBAR



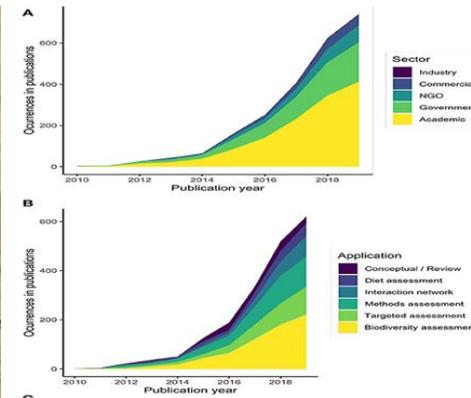
# Traditional approach



DNA Based  
Methods in  
Environmental  
Assessments

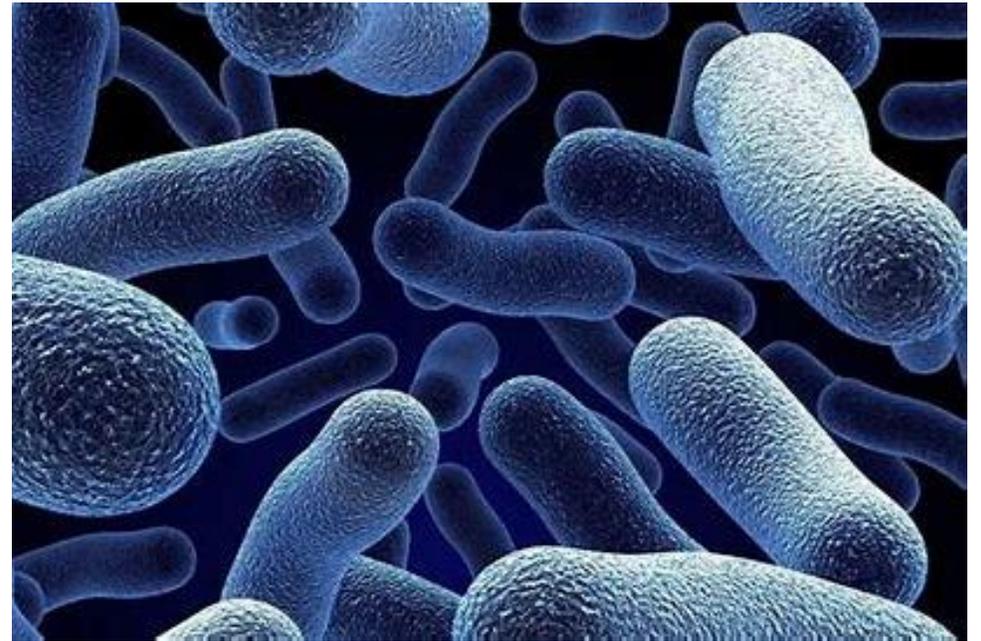
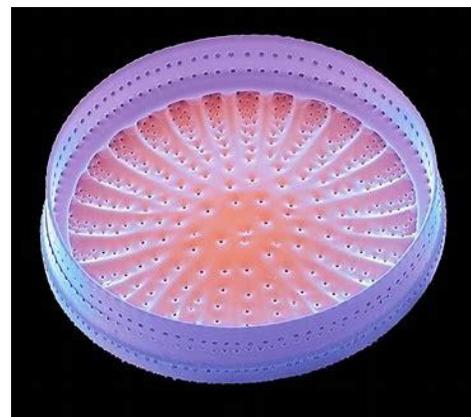


# Does the method work?



# SEPA Engagement

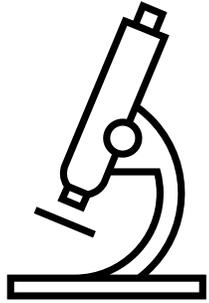
- Microbial Source tracking-qPCR
- Lake Fish PCR
- Diatoms PCR
- Bacteria PCR
- COVID



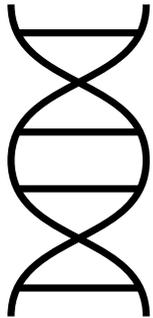
# DNA Method Adoption Benefits

- Greater taxonomic resolution
- Utilise new indicator groups
- Cheaper
- Faster- Just over 1 week
- Taxonomy Capacity



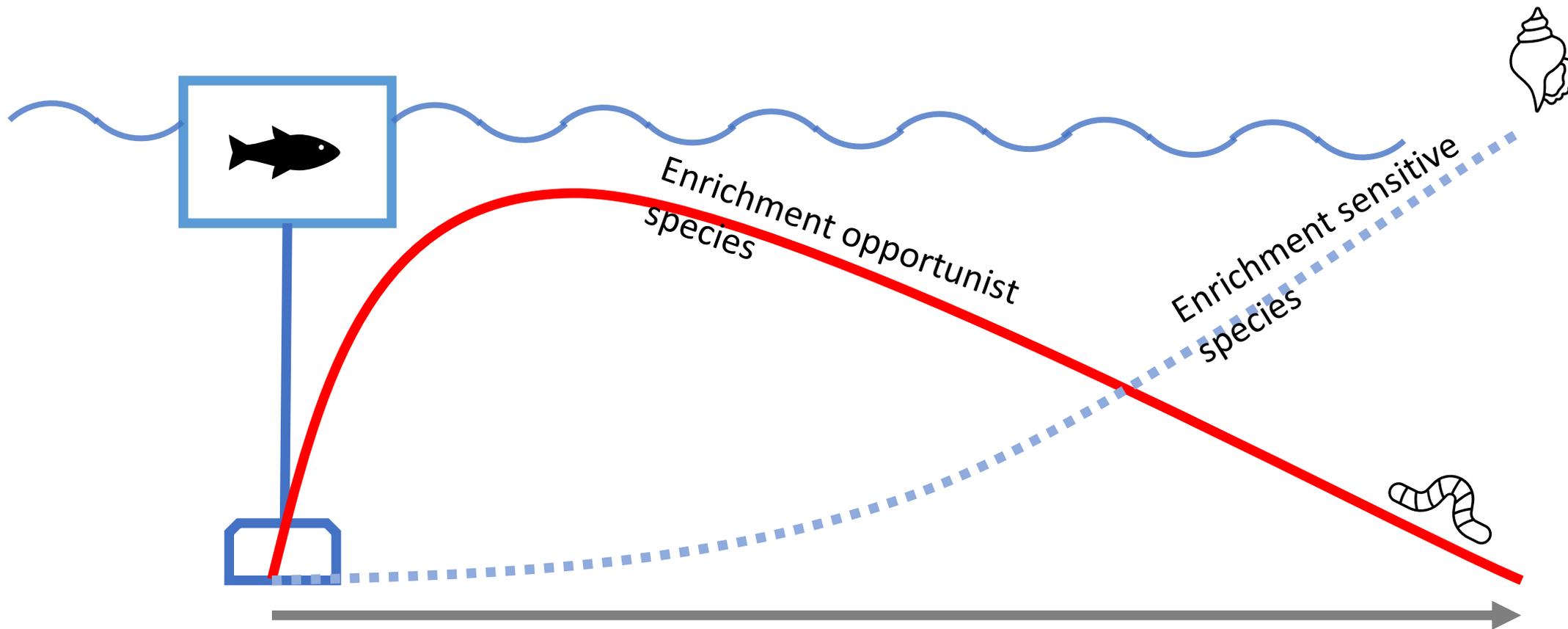


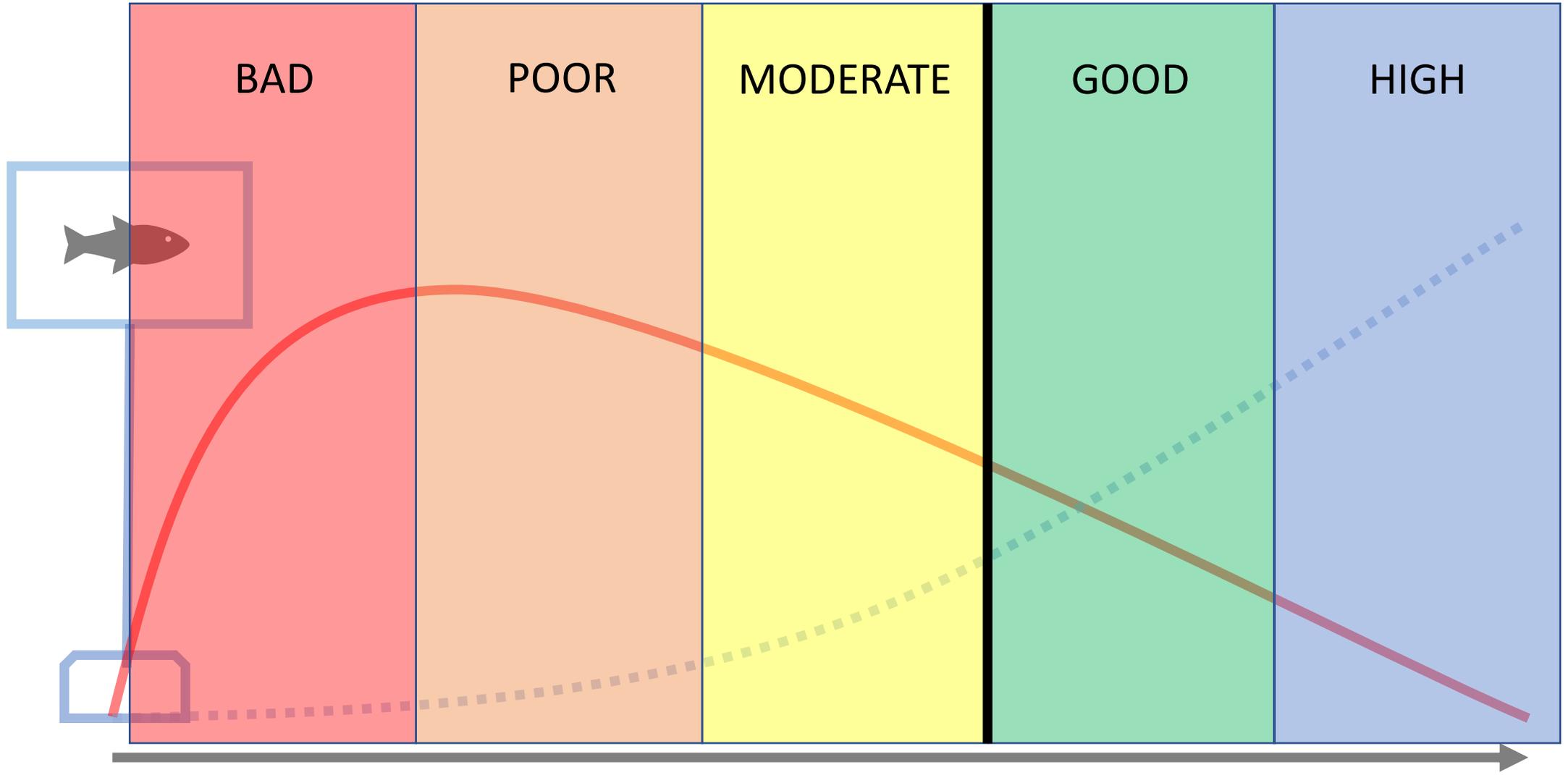
=  $\sim$  2 samples in 6 days

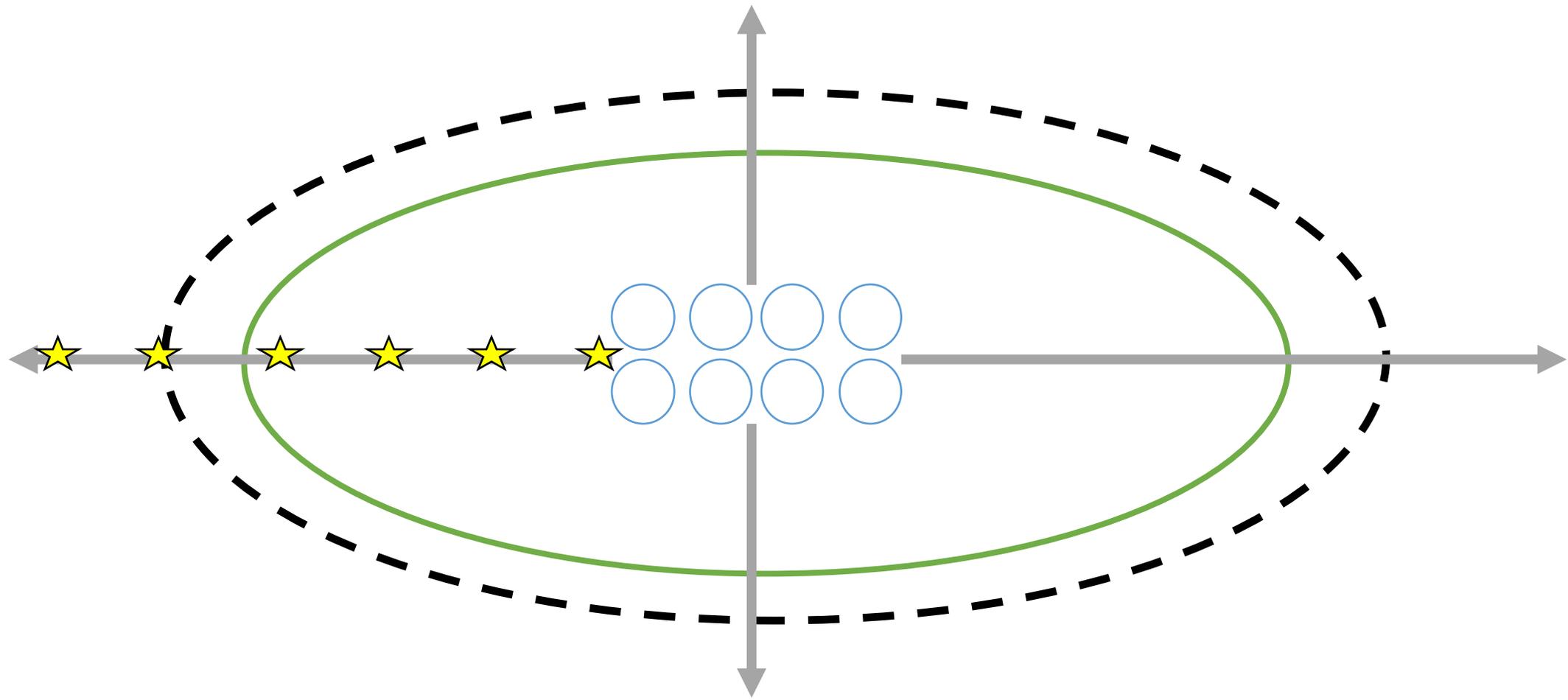


=  $\sim$  100 samples in 7 days

# Meiometbar/1.5



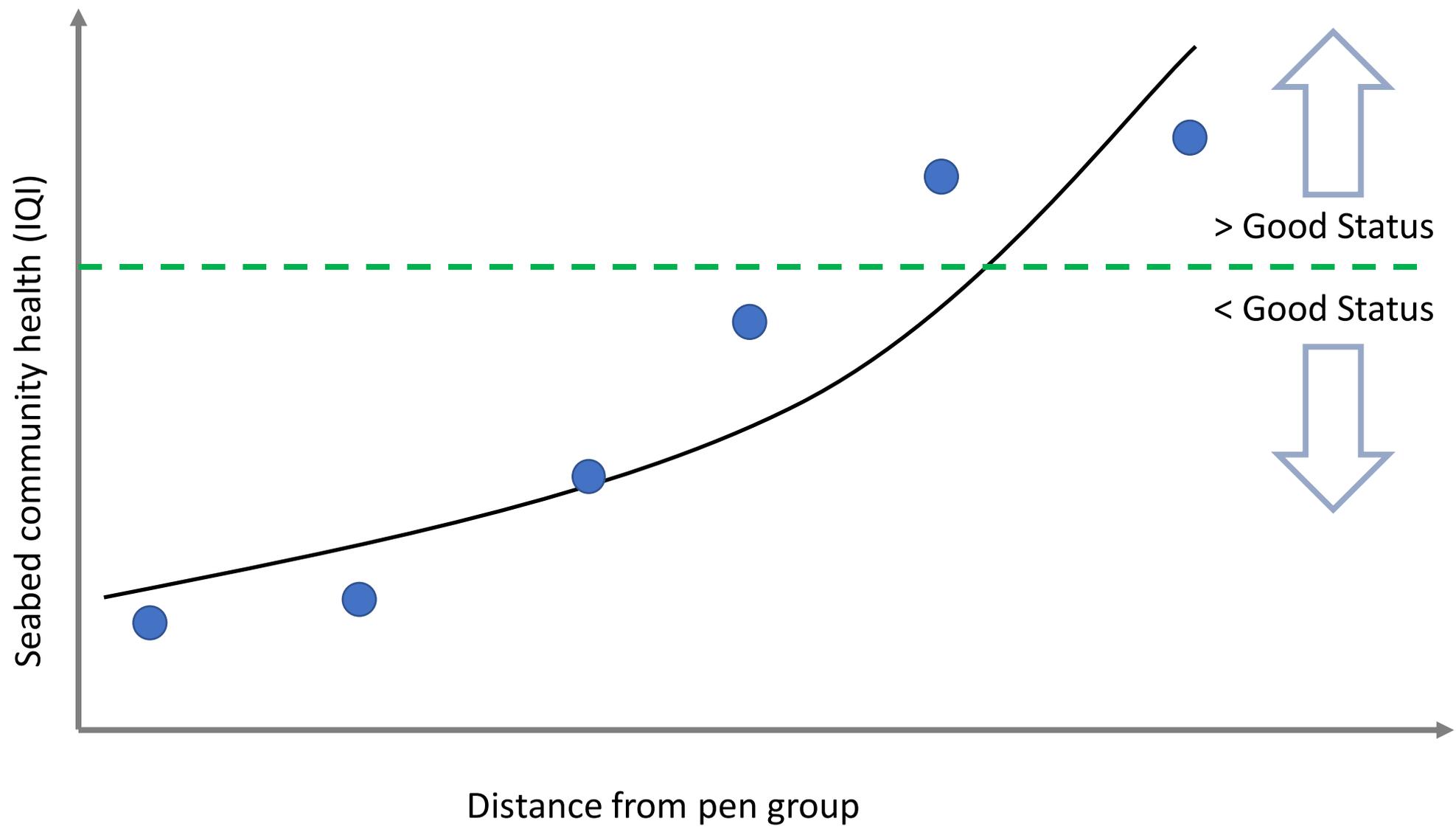


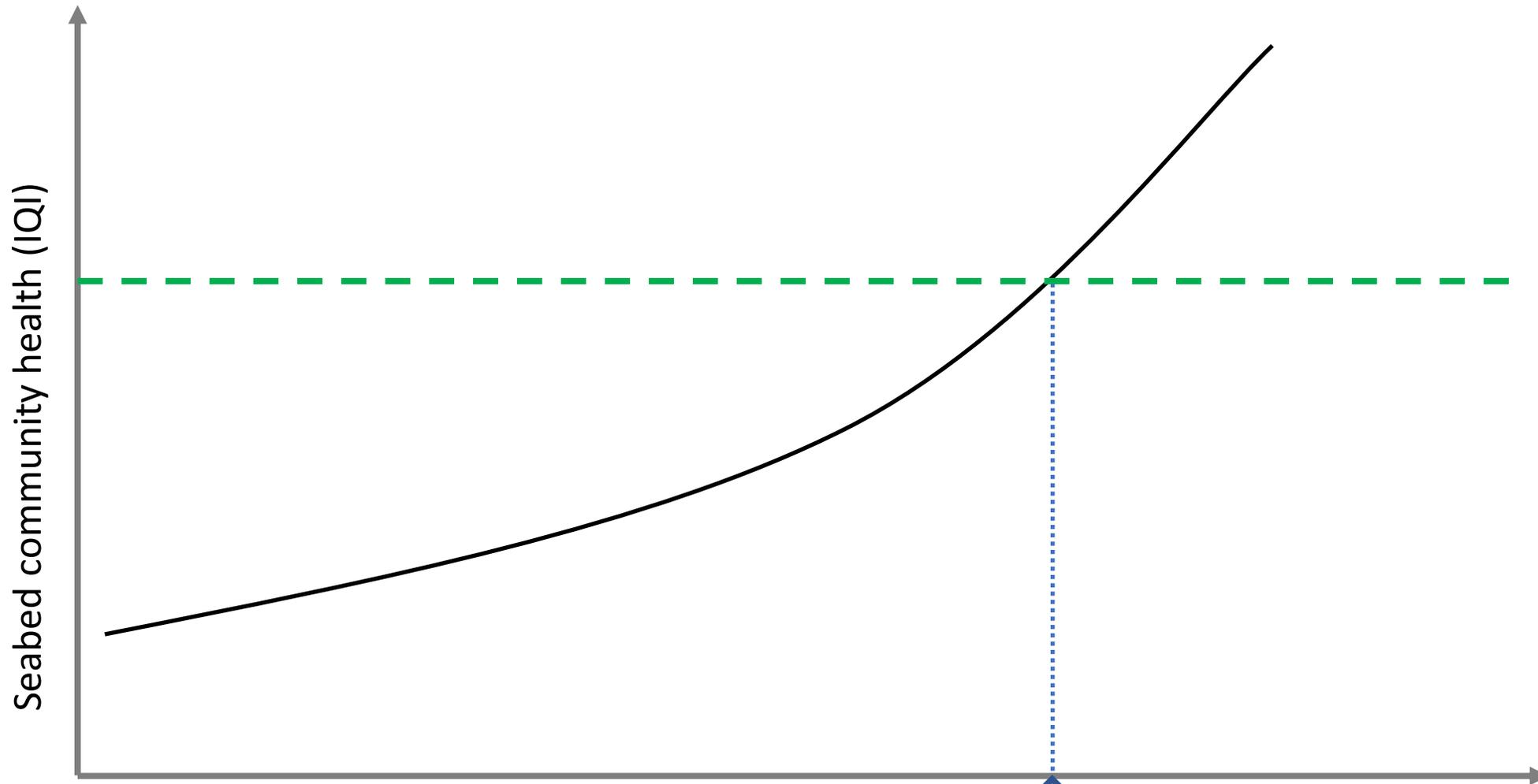


— — — : Mixing zone area

————— : Area < Good

—————> : Survey transect



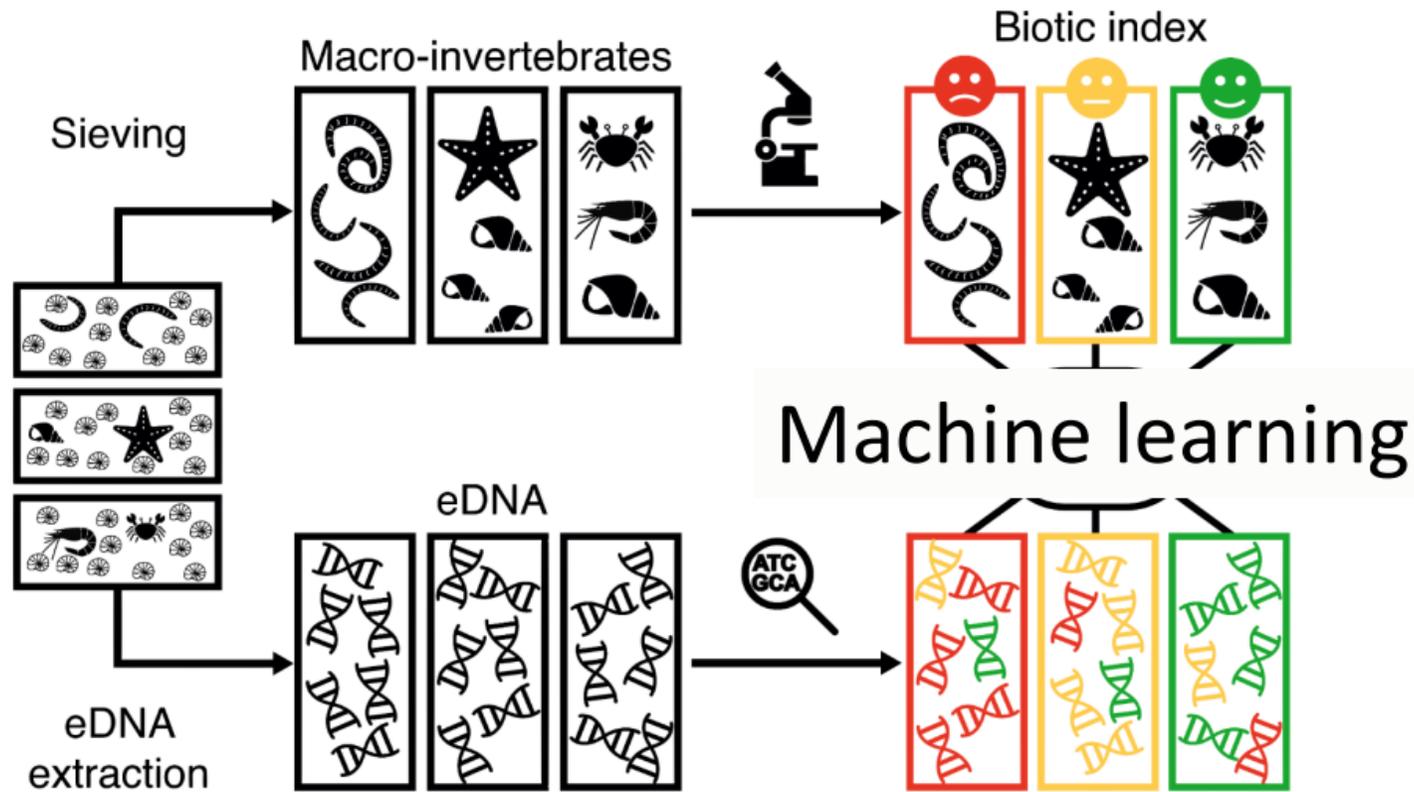


Distance from pen group



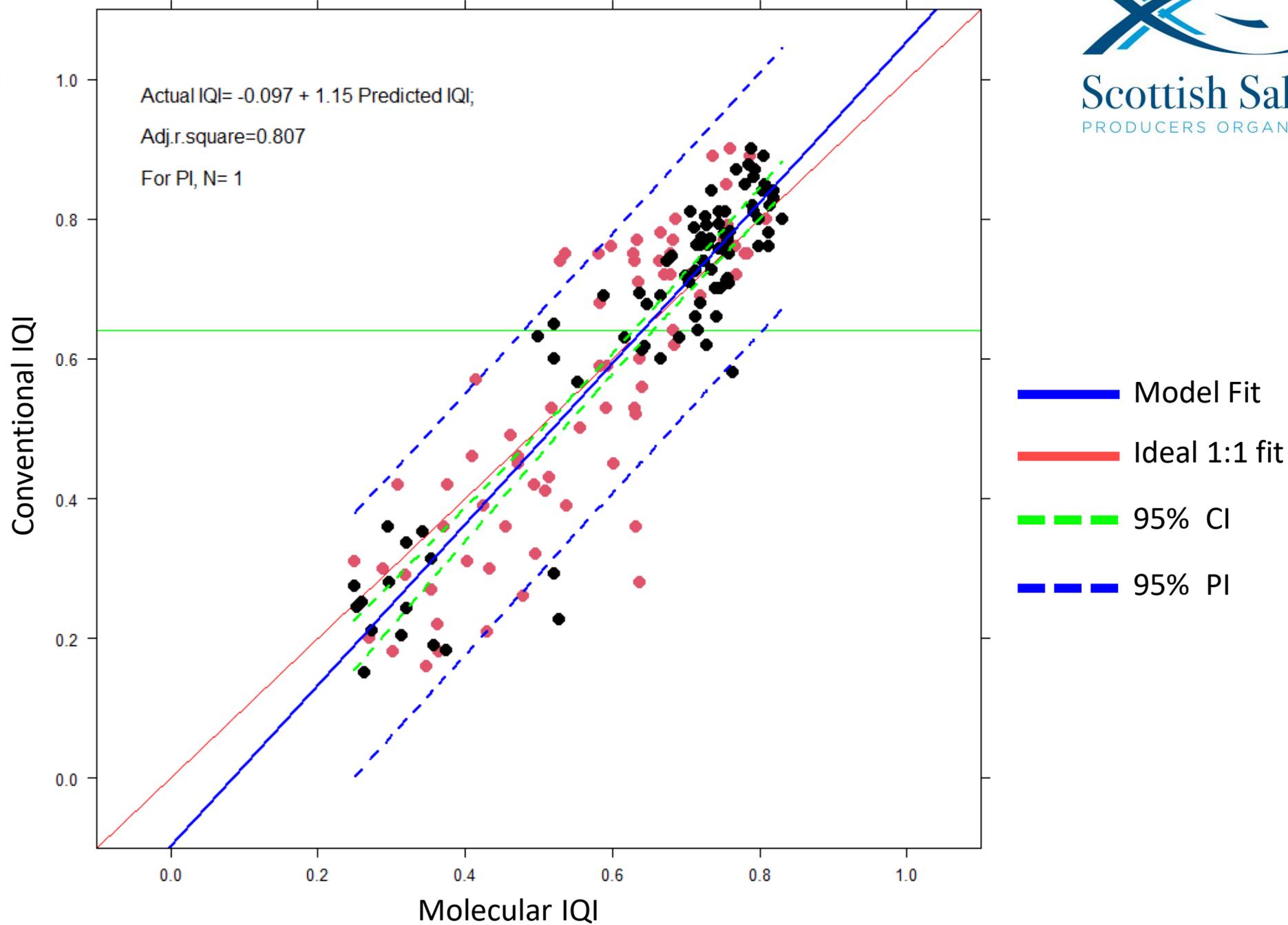
Where is here?

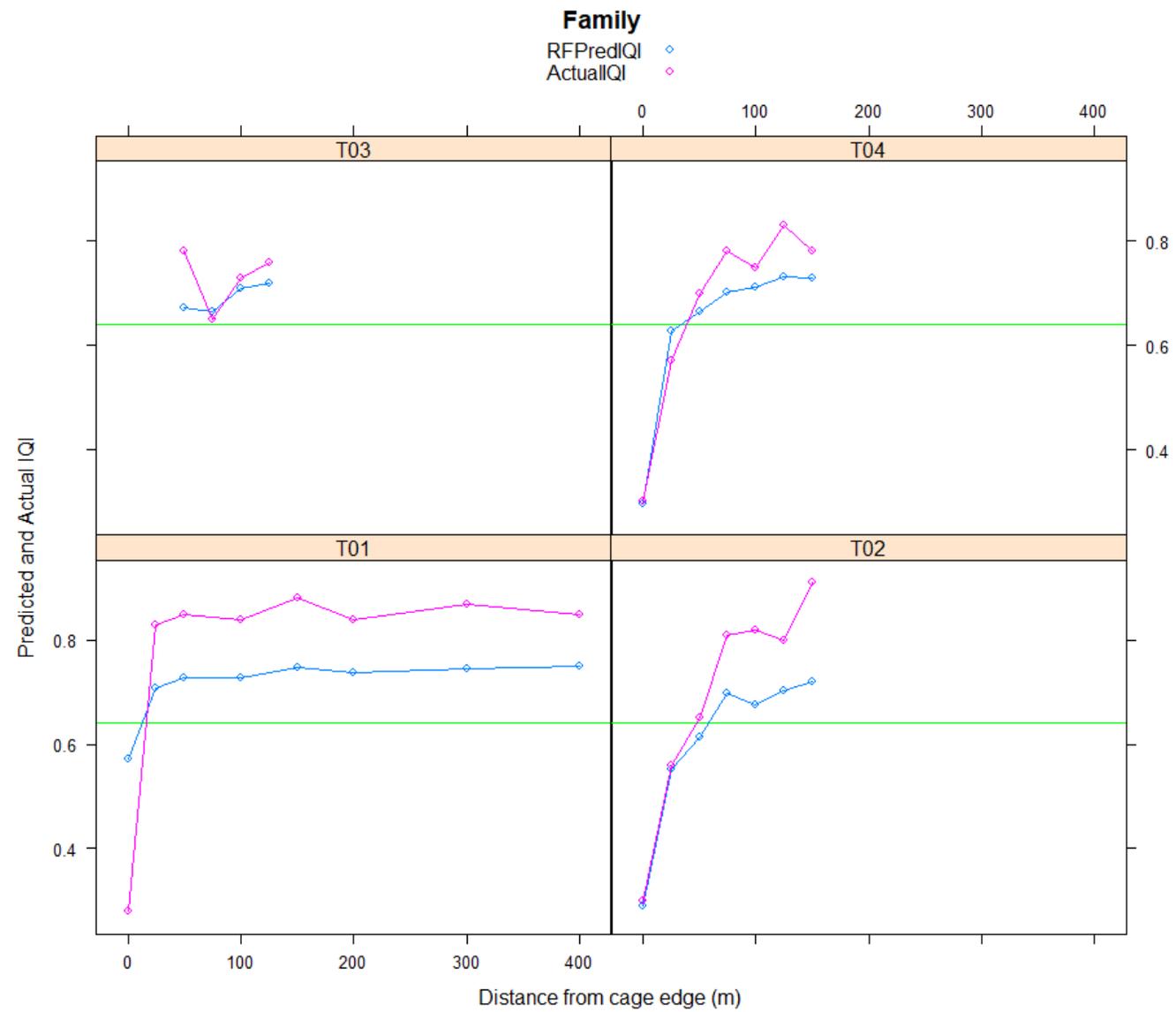
# Linking eDNA and traditional approaches



- For each grab sample generate traditional metrics and eDNA profiles
- Train a machine to link the profile to the IQI metric
- Use the machine to predict metric from a profile (blind-testing).

-  MeioMetBar
-  Kaiserslautern





# Current Position

## **Meiometbar/1.5**

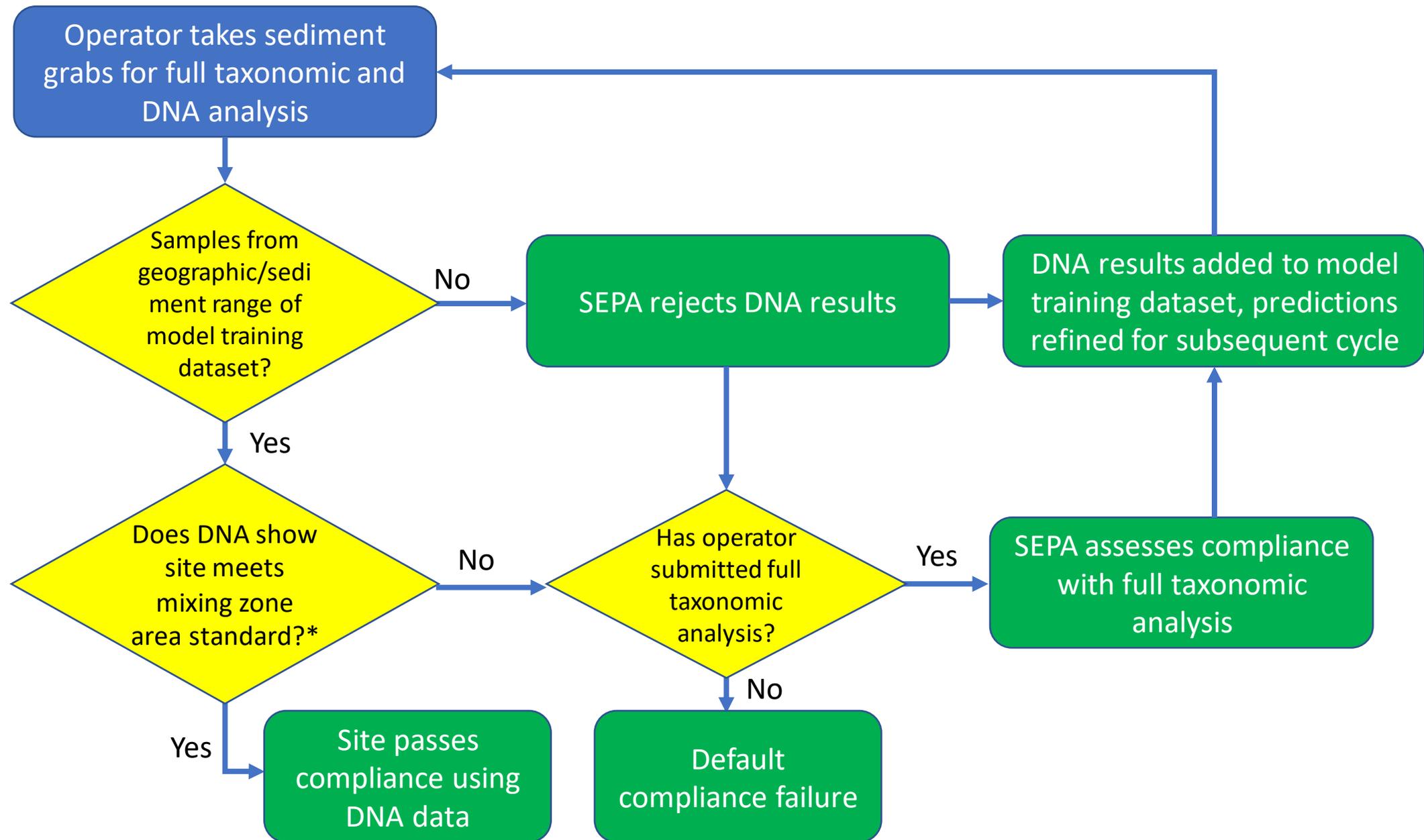
- Reliable relationship that can be used for screening in regulation.
- Covers a subset of Scottish sea bed habitat types.
- Describes impact gradient
- BIOSIS Reviewed Statistical Integrity

## **BACTMETBAR**

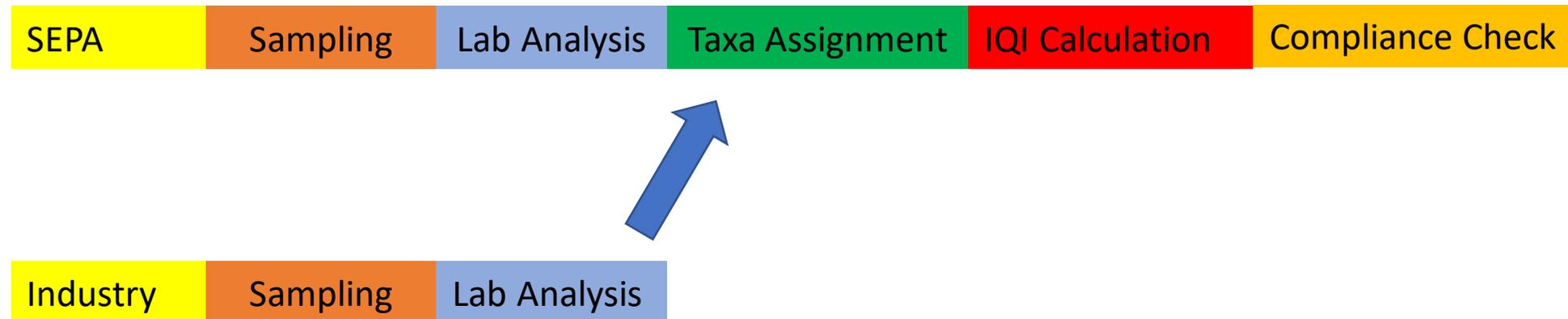
- Extending habitat types/geography.
- Additional data on impact gradient.
- Temporal variability
- Inter-laboratory calibration
- Update software
- £2.1M, 3years

# Implementation

- Screening Tool
- Making it Operational- Ramping Up
- Work Flow
- Time scales



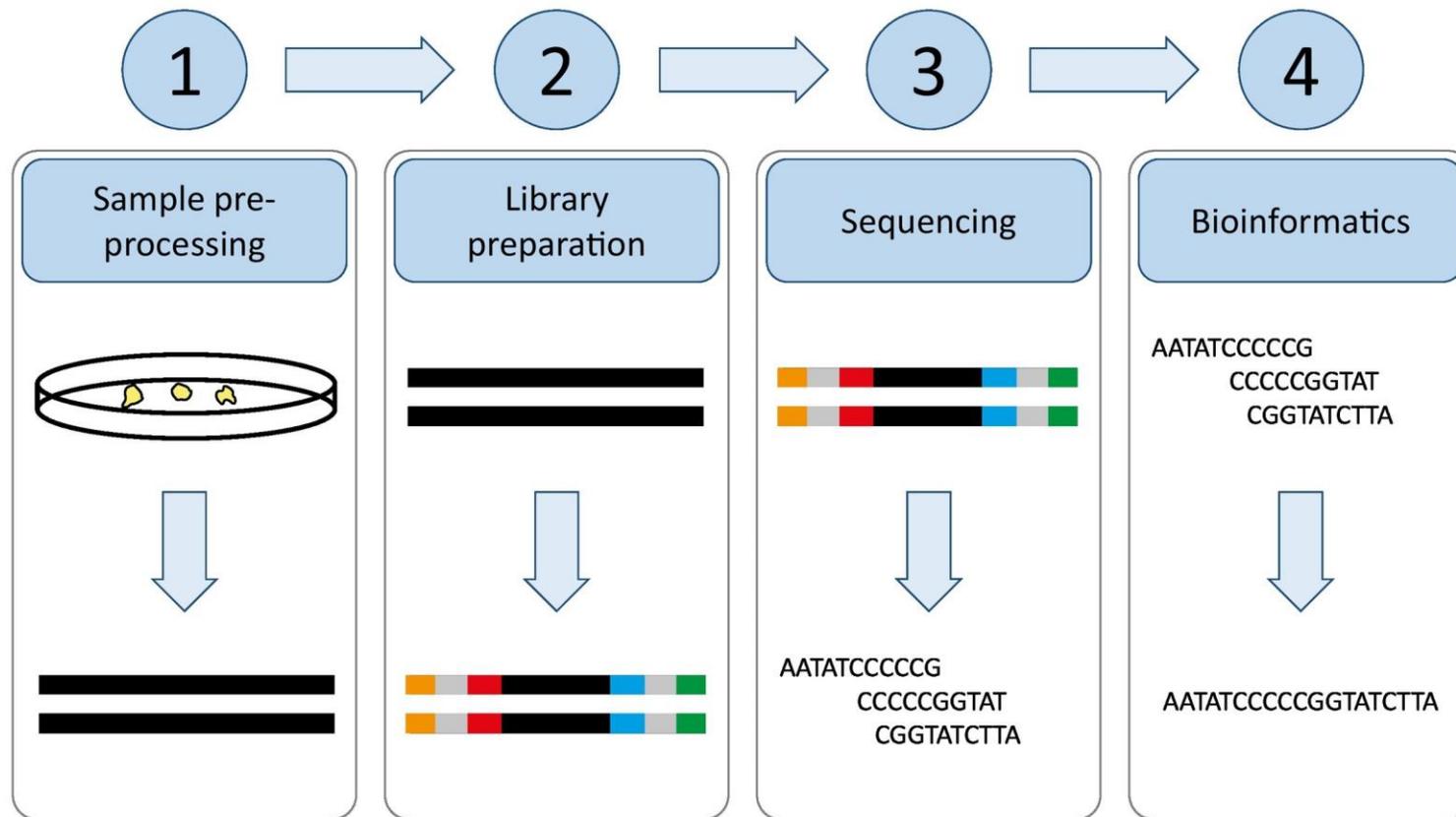
# Regulatory Work Flow Schematic





# Sampling





# Data Management Tasks

Establish a data portal, define submission needs.

Bacteria taxonomic assignment.

IQI Calculation

Compliance Assessment.

**Go Live Date- End of June**

# Questions?