



DEAKIN
UNIVERSITY



CERRF
CENTRE FOR REGIONAL
AND RURAL FUTURES



Quantitative Aquatic
Ecosystem Laboratory



Water
Research
AUSTRALIA



Barwon Water

PhD Research Project

Mariah Sampson

Stream restoration for
water quality, stream
morphology, and ecology?



Restoration planting,
Photo from Corangamite Catchment Management Authority



Removing willows can complicate
restoration



How do willow
restorations recover?

Restoration of Charley Creek Tributary in the
Gellibrand Catchment

photo from Corangamite Catchment Management Authority



What do we know about
the recovery process?

Restoration of Charley Creek Tributary in the
Gellibrand Catchment

photo from Corangamite Catchment Management Authority

Key Research Questions

1. How does the restoration of a willow dominated river reach impact the water quality, morphology, and instream ecology?



Key Research Questions

2. How does different vegetation and restorations sites of different ages and sizes influence water quality, aquatic plant community composition, and stream morphology?



An aerial photograph of a vast, dense tropical forest. A river, with a brownish, slightly murky water color, winds its way through the center of the forest, creating a natural corridor. The forest canopy is a rich, textured green, with varying shades indicating different tree species and heights. The overall scene is one of a remote, undisturbed natural environment.

Where do we collect the data to
answer these questions?

Sites for restoration monitoring

2020 – 2021

Before restoration

Vegetation
Types

4 Willow

1 Treatment

Sites for restoration monitoring

2020 – 2021

Before restoration

2022 – 2023

After restoration

Vegetation
Types

4 Willow

1 Treatment

Sites for vegetation comparison

2021

Vegetation
Types

4 Willow

3 Revegetated

3 Thin-Strip

Sites for vegetation comparison

Vegetation Types

2021

4 Willow

3 Revegetated

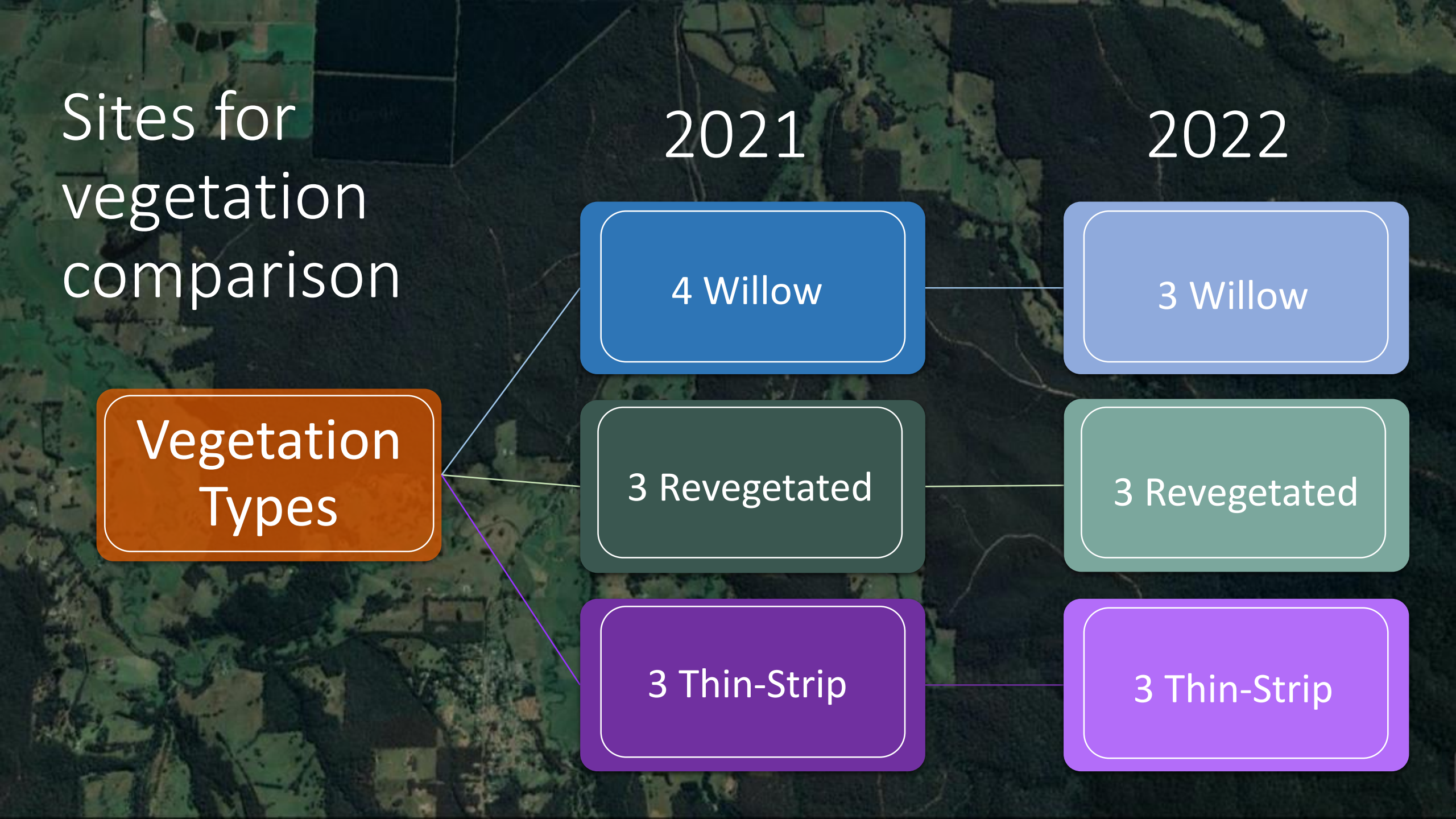
3 Thin-Strip

2022

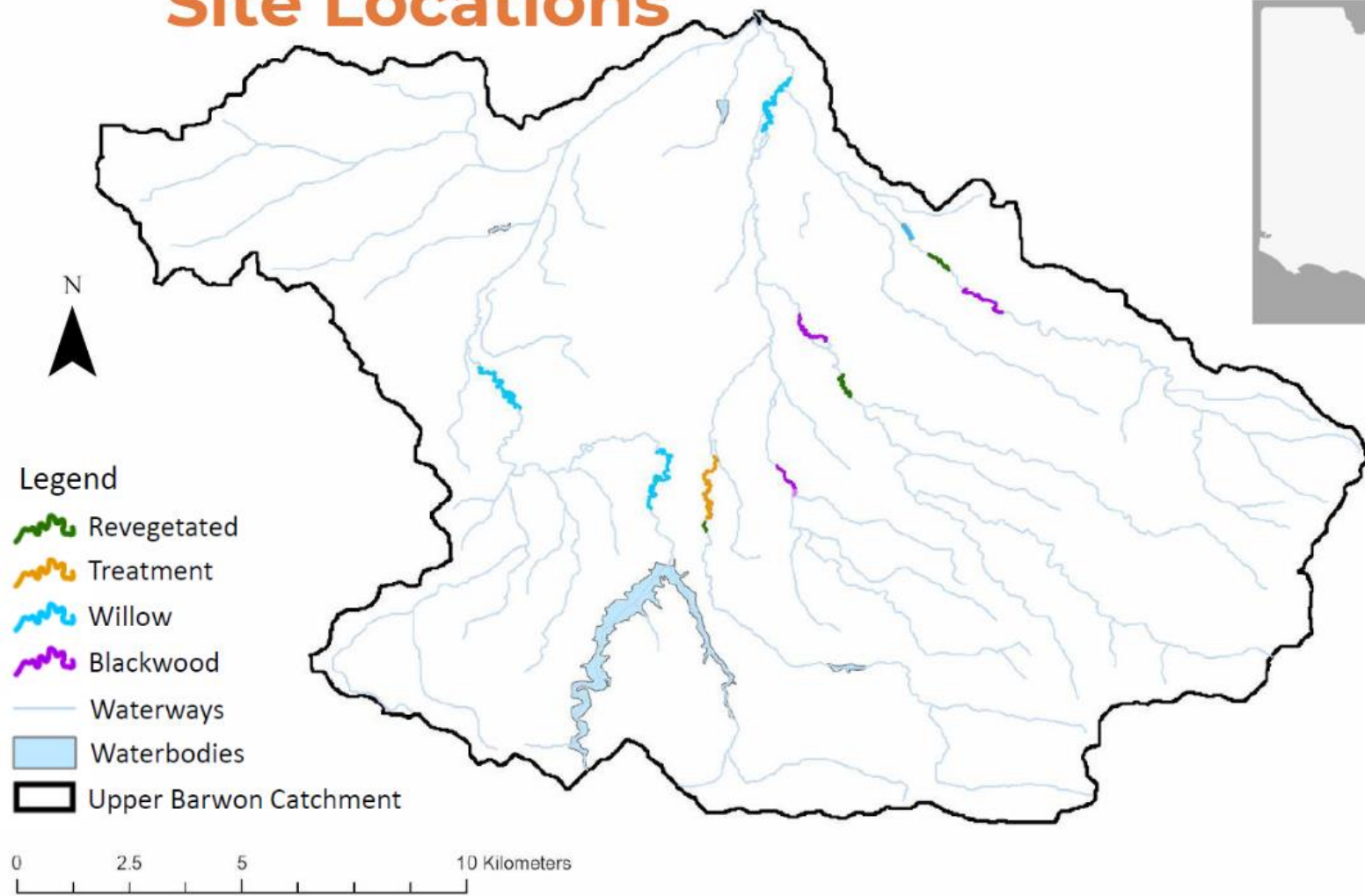
3 Willow

3 Revegetated

3 Thin-Strip

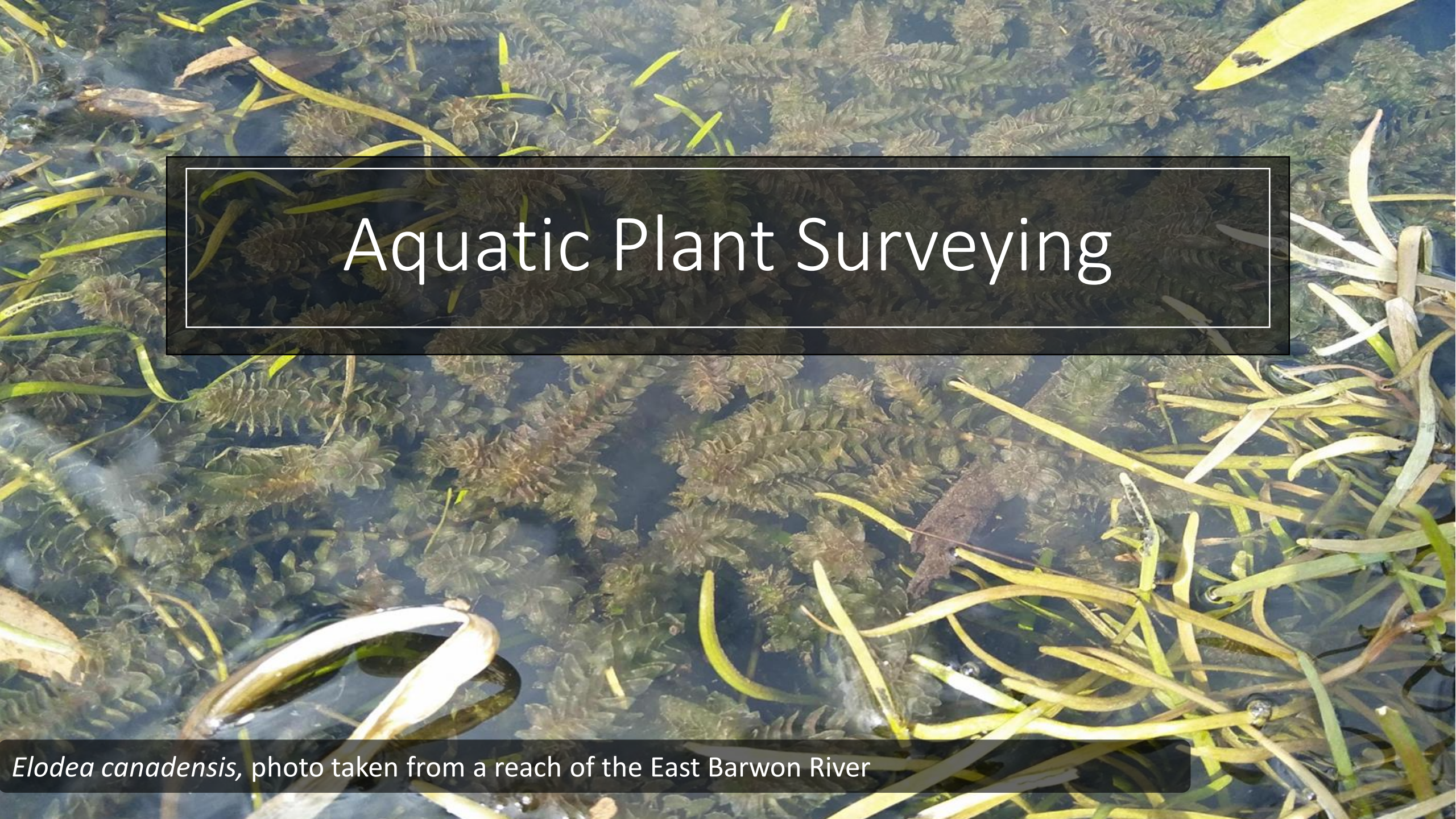


Site Locations



An aerial photograph of a vast, dense tropical rainforest. A river, with a brownish, slightly murky water color, winds its way through the center of the forest, creating a natural corridor. The forest canopy is a rich, textured green, with varying shades indicating different tree species and the density of the foliage. The perspective is from a high altitude, looking down on the landscape.

How do we collect the data to
answer these questions?

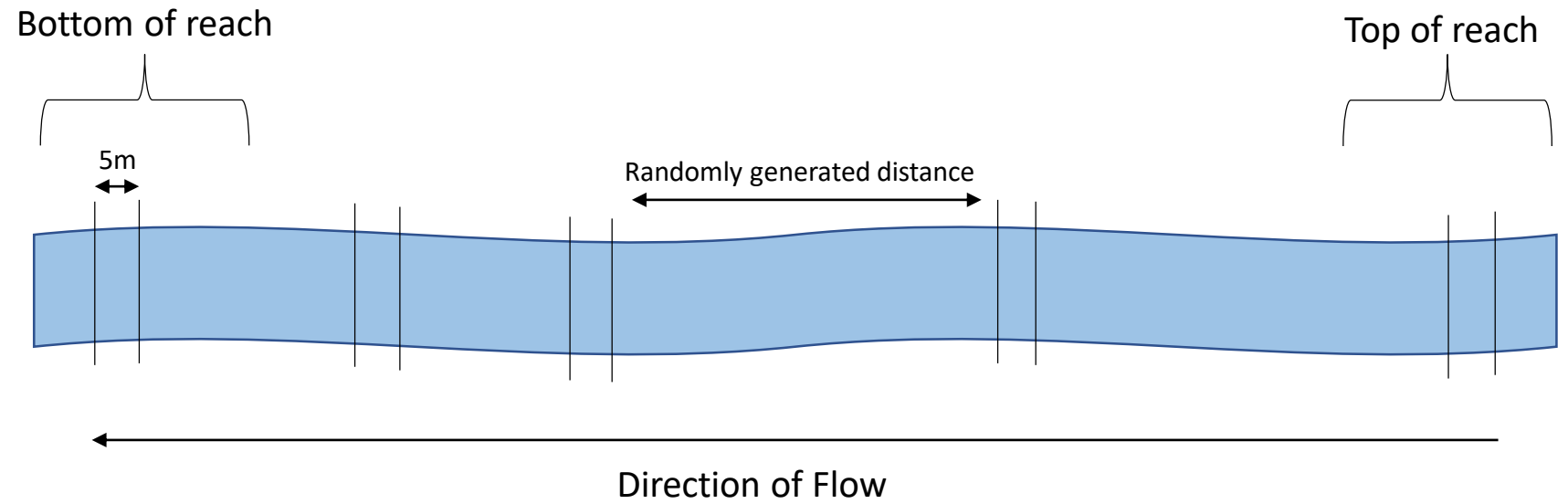


Aquatic Plant Surveying

Elodea canadensis, photo taken from a reach of the East Barwon River

Aquatic Plant Surveying

Belt transects for aquatic
plant surveying



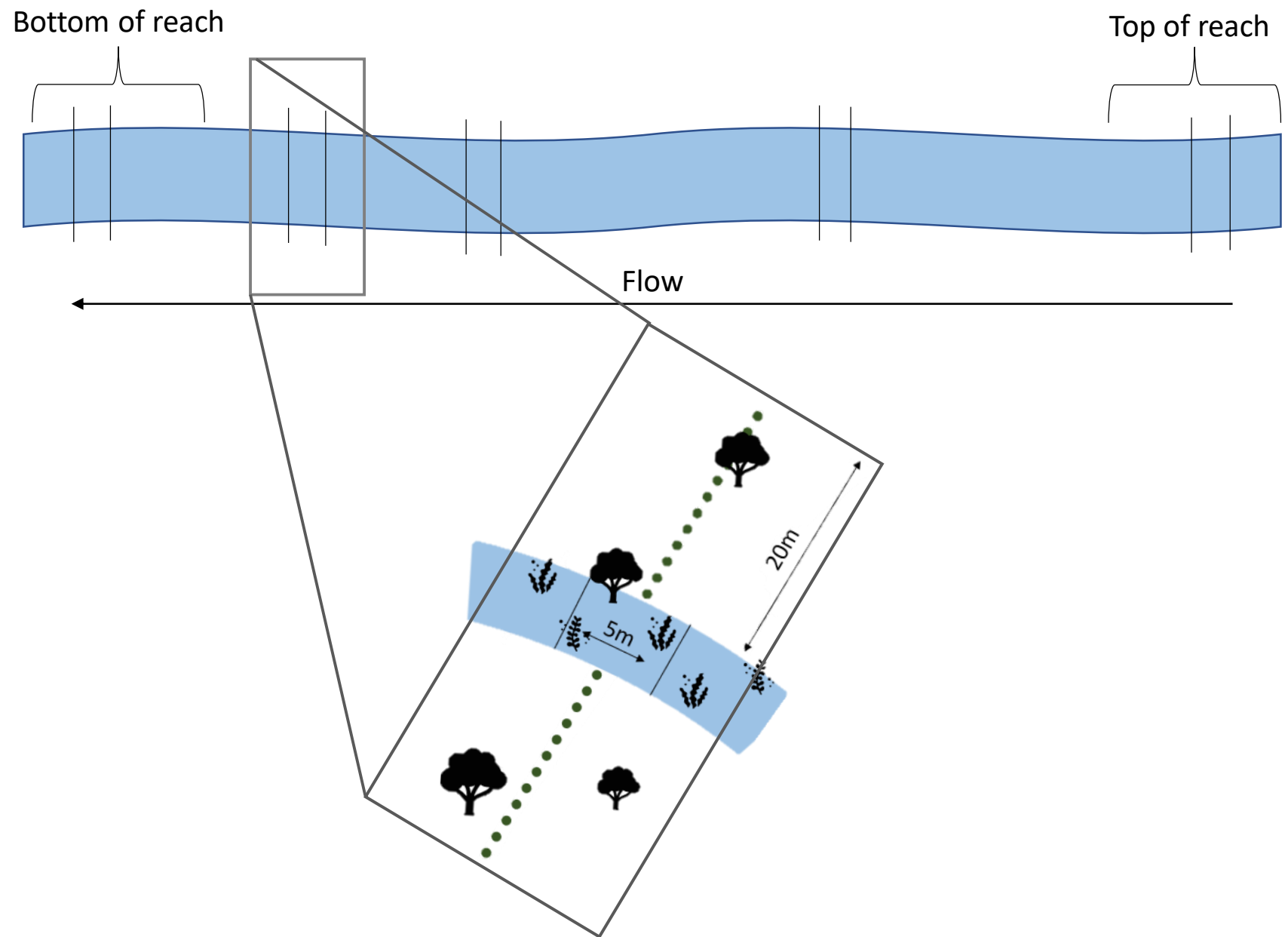


Vegetation Surveying

Canopy cover at a 14 year old riparian restoration site

Vegetation Surveying

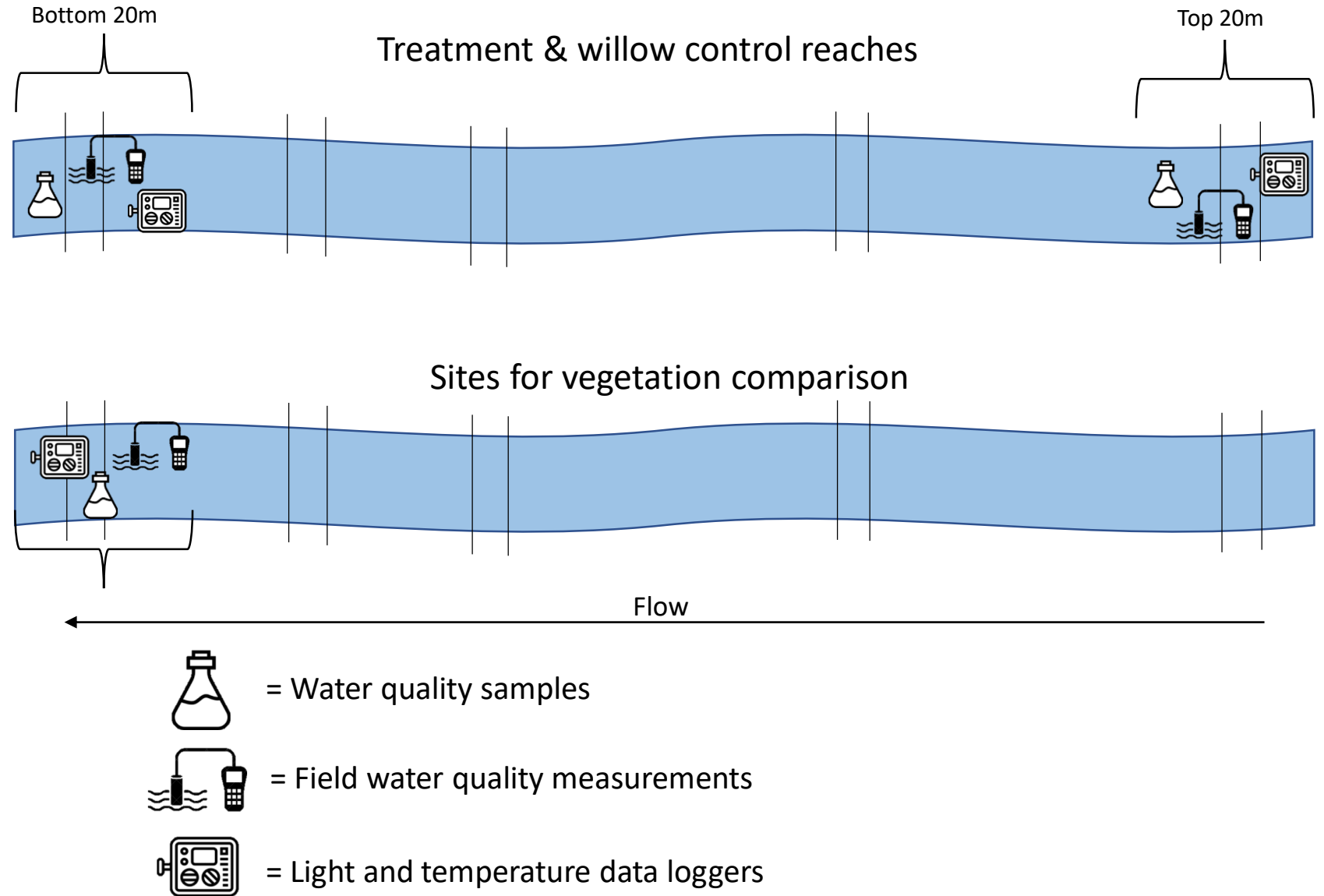
Line-point transects for
vegetation surveying





WATER QUALITY SAMPLING

Field water
quality samples
&
Data loggers

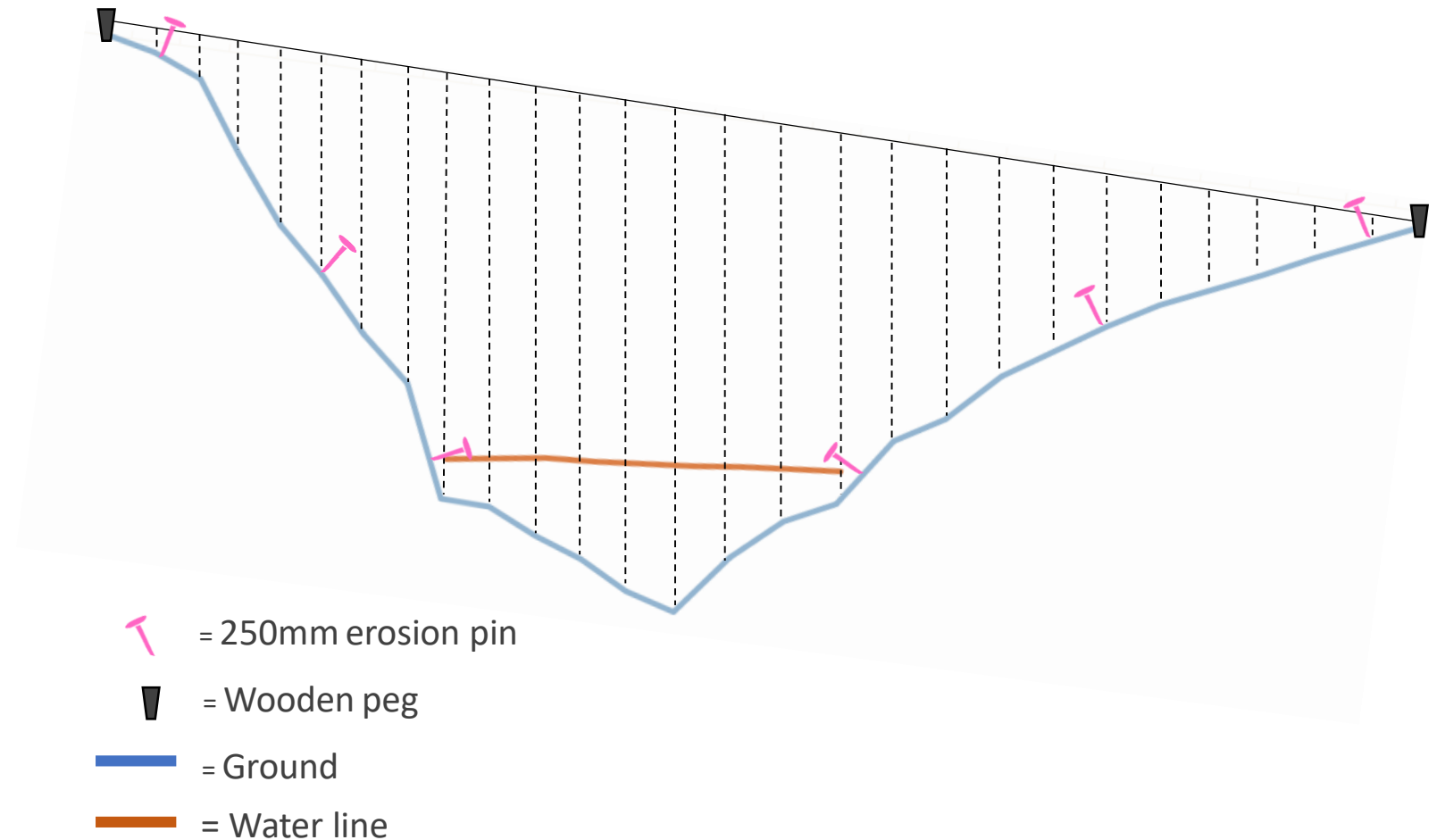




MORPHOLOGY SURVEYING

Morphology
Sampling
&
Erosion Pins

Schematic diagram of a transect at a 14 year old revegetation site



What types of data were collected?



4 rounds of water quality samples



10 Surveys of riparian vegetation and
5 Surveys of instream plants per site



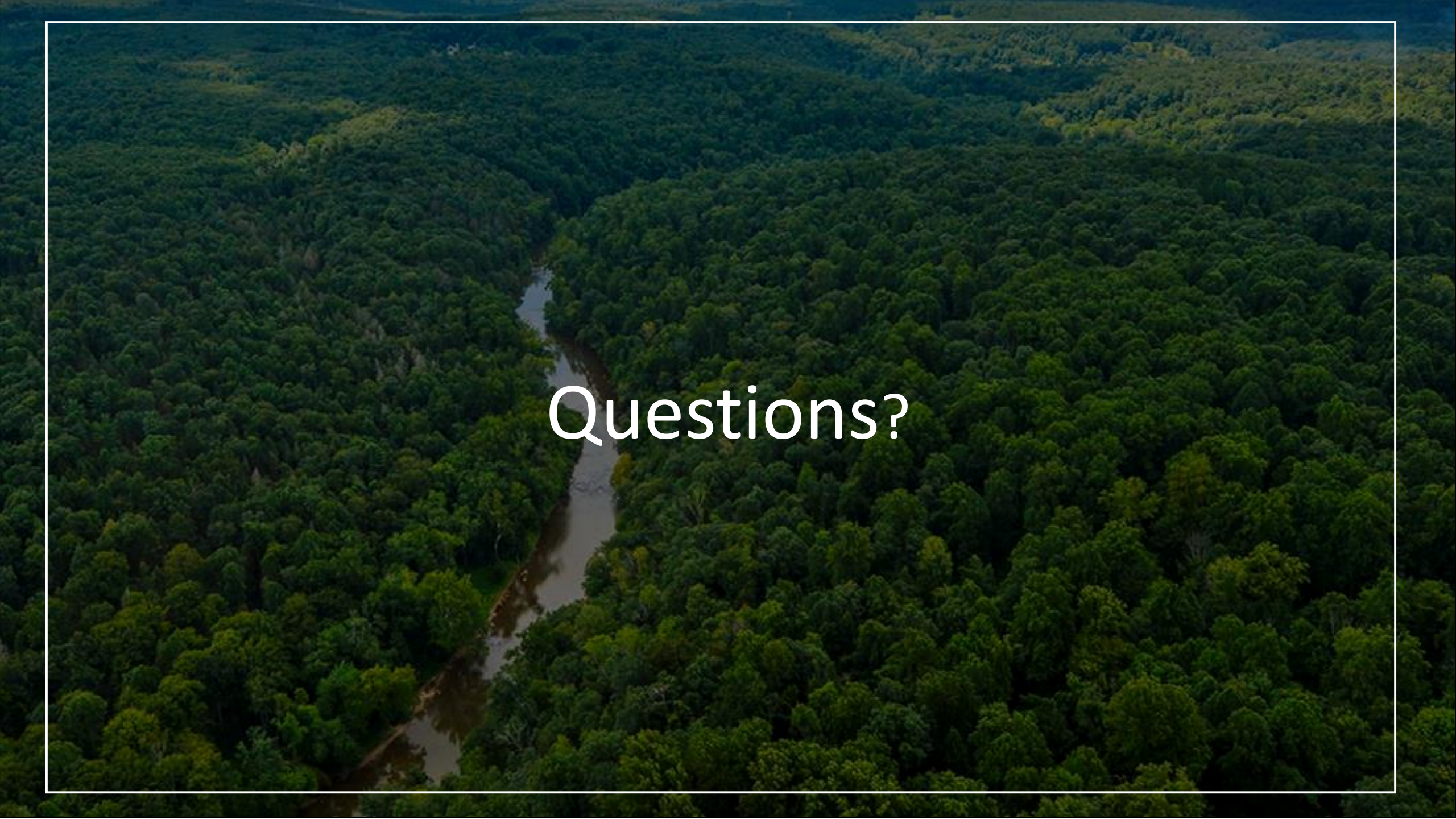
26 Data loggers placed to record stream temperature



3-6 Channel morphology measurements per site

General Progress & Next Steps



An aerial photograph of a vast, dense tropical rainforest. A river, with a brownish, slightly murky water color, winds its way through the center of the forest, creating a natural corridor. The forest canopy is a deep, vibrant green, with varying shades indicating different tree species and the density of the foliage. The perspective is from a high altitude, looking down on the landscape. The word "Questions?" is superimposed in the center of the image in a clean, white, sans-serif font.

Questions?