

# The Bourne Rivulet Initiative

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## Major areas of focus

Sewage and sewerage; ongoing.

Proposals for a new wetland;  
ongoing.

Deterioration in the eastern arm of  
the Bourne Rivulet?

# The role of stakeholder groups

Does the Bourne Rivulet Group still have an important role?

**Yes.** The “eyes and ears” of local stakeholders are valuable and valued; local knowledge and networks likewise.

# The role of stakeholder groups

How does a group of this scale connect to different organisations and groups?

Generally, very well. Emerging groups need to be incorporated and connected, e.g. Test & Itchen Catchment Partnership.

## **Chalk Headwaters stakeholder groups more generally**

Local groups were initiated after the first Forum. Two are established and have broad support.

Should there be more such groups?

Which, where and how?

# Phosphorus Research

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7<sup>th</sup> November 2014

# **Phosphorus research on the headwaters of the River Itchen**

Forms of phosphorus

Phosphorus in the upper Itchen:  
high frequency sampling

Summary

# Forms of phosphorus

# Forms of phosphorus: reactivity

## “Reactive” Phosphorus

- Reacts readily with chemical reagents.
- In a form that is readily available to biota.

## “Unreactive” Phosphorus

- Reacts with chemical reagents only after being released during analysis (digestion).
- Not readily available to plants, but could be.

# Forms of phosphorus: size fractions

## “Soluble”

Carried by the water; passes through a  $0.22\mu\text{m}$  filter.

## “Colloidal”

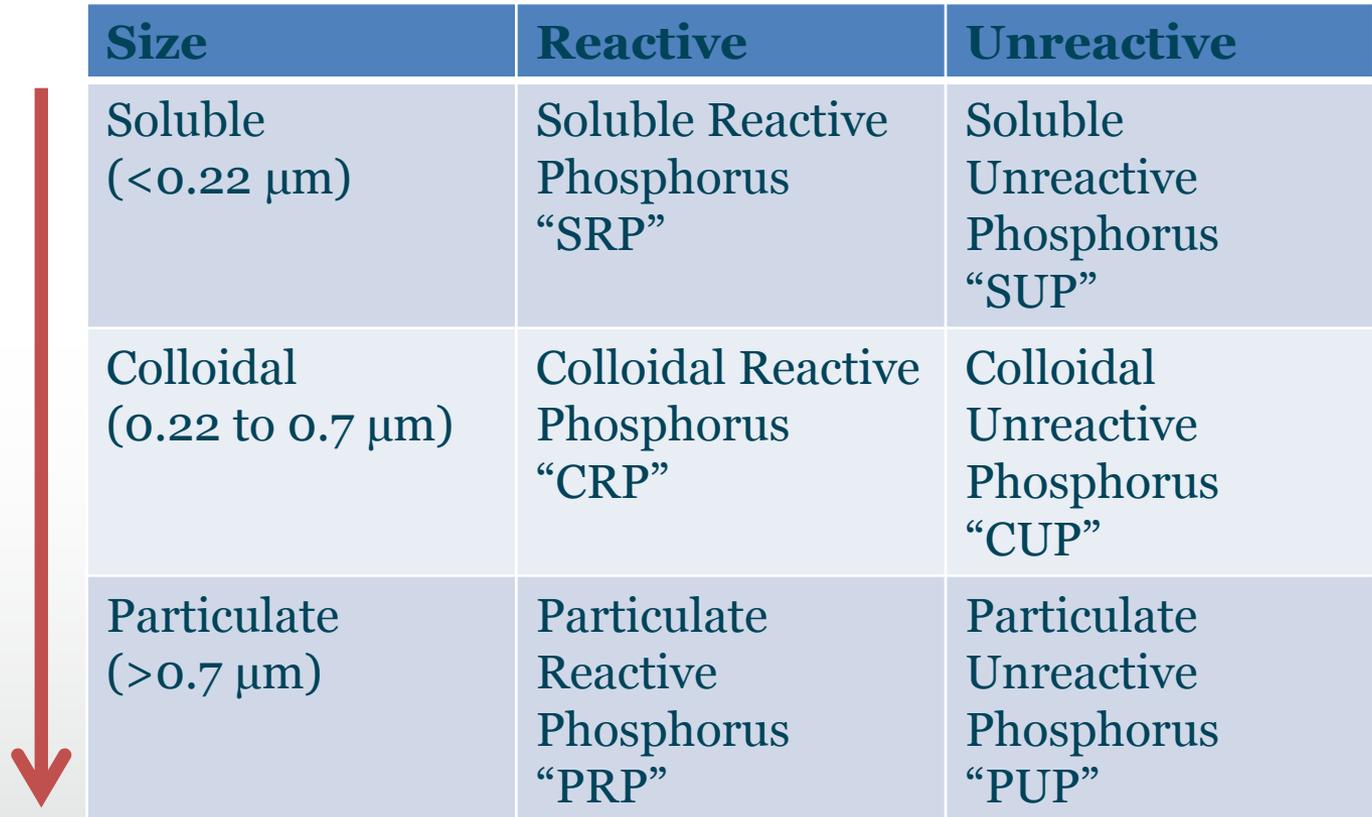
Carried by the water; passes through a  $0.7\mu\text{m}$  filter but not a  $0.22\mu\text{m}$  filter.

## “Particulate”

Suspended in the water but may settle out or be carried by it; does not pass through a  $0.7\mu\text{m}$  filter.

# Forms of phosphorus

*“Where”*

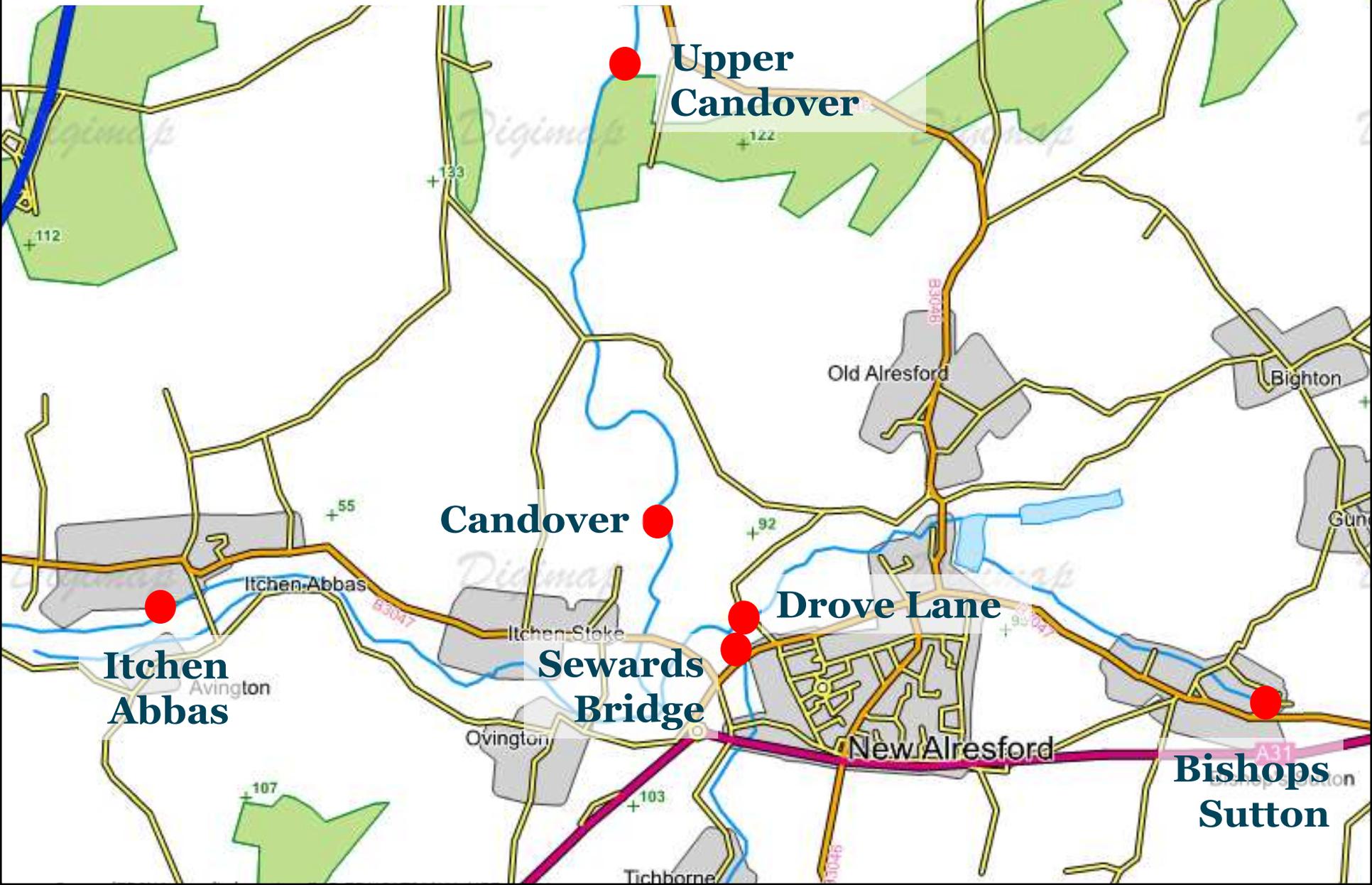


Size	Reactive	Unreactive
Soluble ( $<0.22 \mu\text{m}$ )	Soluble Reactive Phosphorus “SRP”	Soluble Unreactive Phosphorus “SUP”
Colloidal ( $0.22 \text{ to } 0.7 \mu\text{m}$ )	Colloidal Reactive Phosphorus “CRP”	Colloidal Unreactive Phosphorus “CUP”
Particulate ( $>0.7 \mu\text{m}$ )	Particulate Reactive Phosphorus “PRP”	Particulate Unreactive Phosphorus “PUP”

*“When”*

# Phosphorus in the upper Itchen

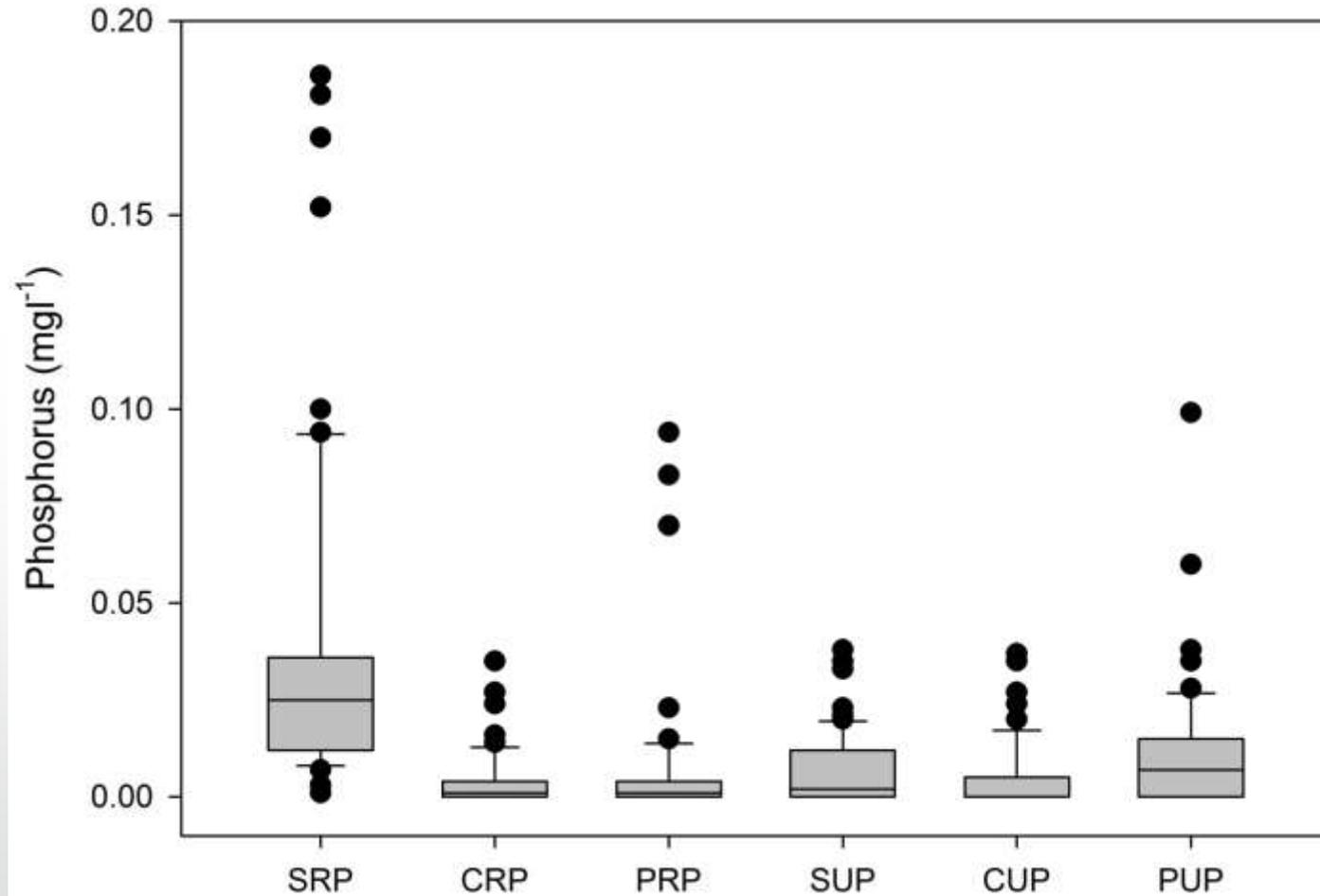
# High frequency sampling



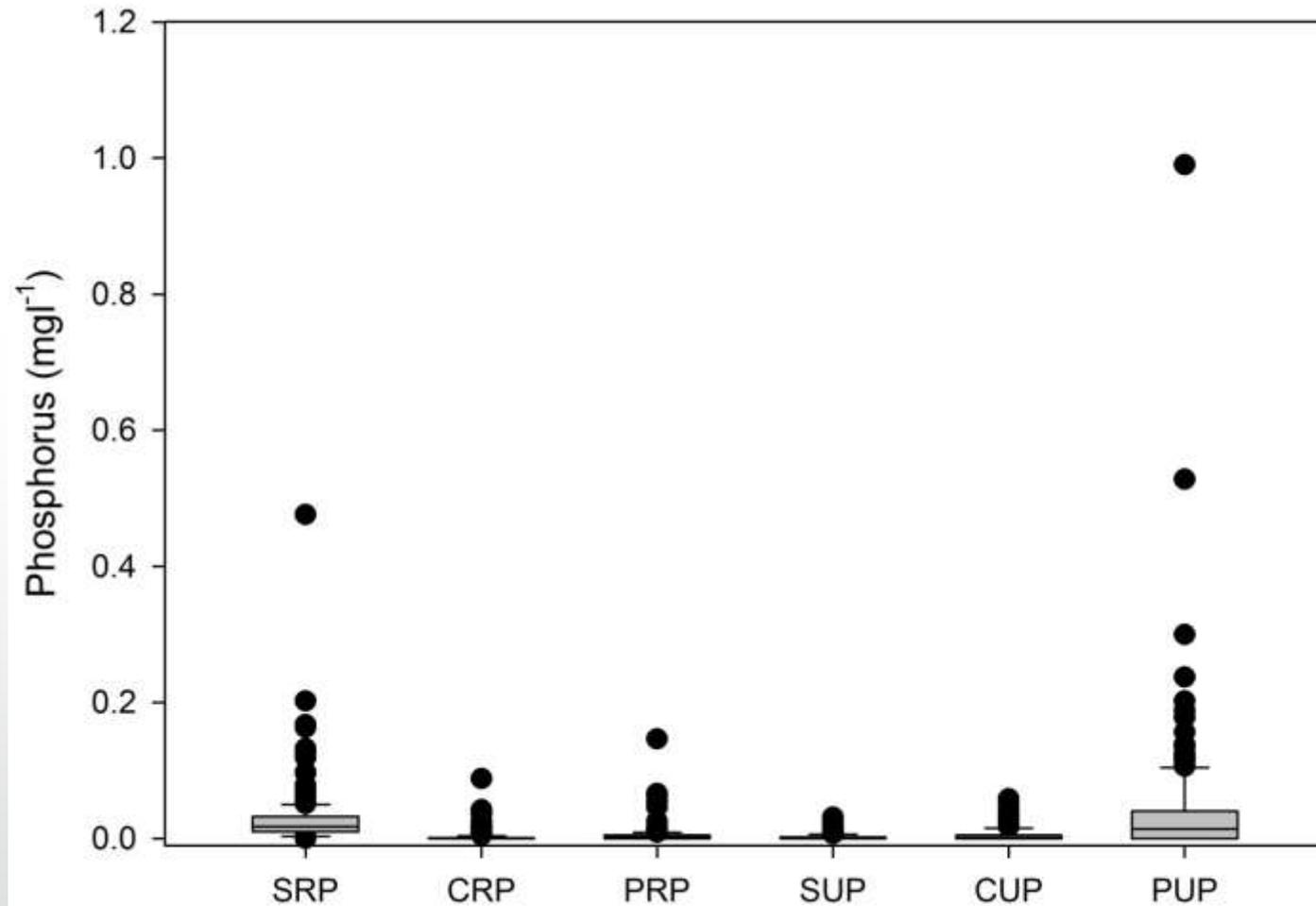
# High frequency sampling

Location & description	Sampling period
Bishops Sutton	July 2013 to September 2013
Upper Candover	February 2014 to May 2014 (sampling ongoing)
Candover	August 2013 to May 2014 (sampling ongoing)
Tichbourne/Cheriton Stream at Swards Bridge gauging station	July 2013 to May 2014 (sampling ongoing)
Arle at Drove Lane gauging station	July 2013 to May 2014 (sampling ongoing)
Arle at Itchen Abbas	July 2013 to May 2014 (sampling ongoing)

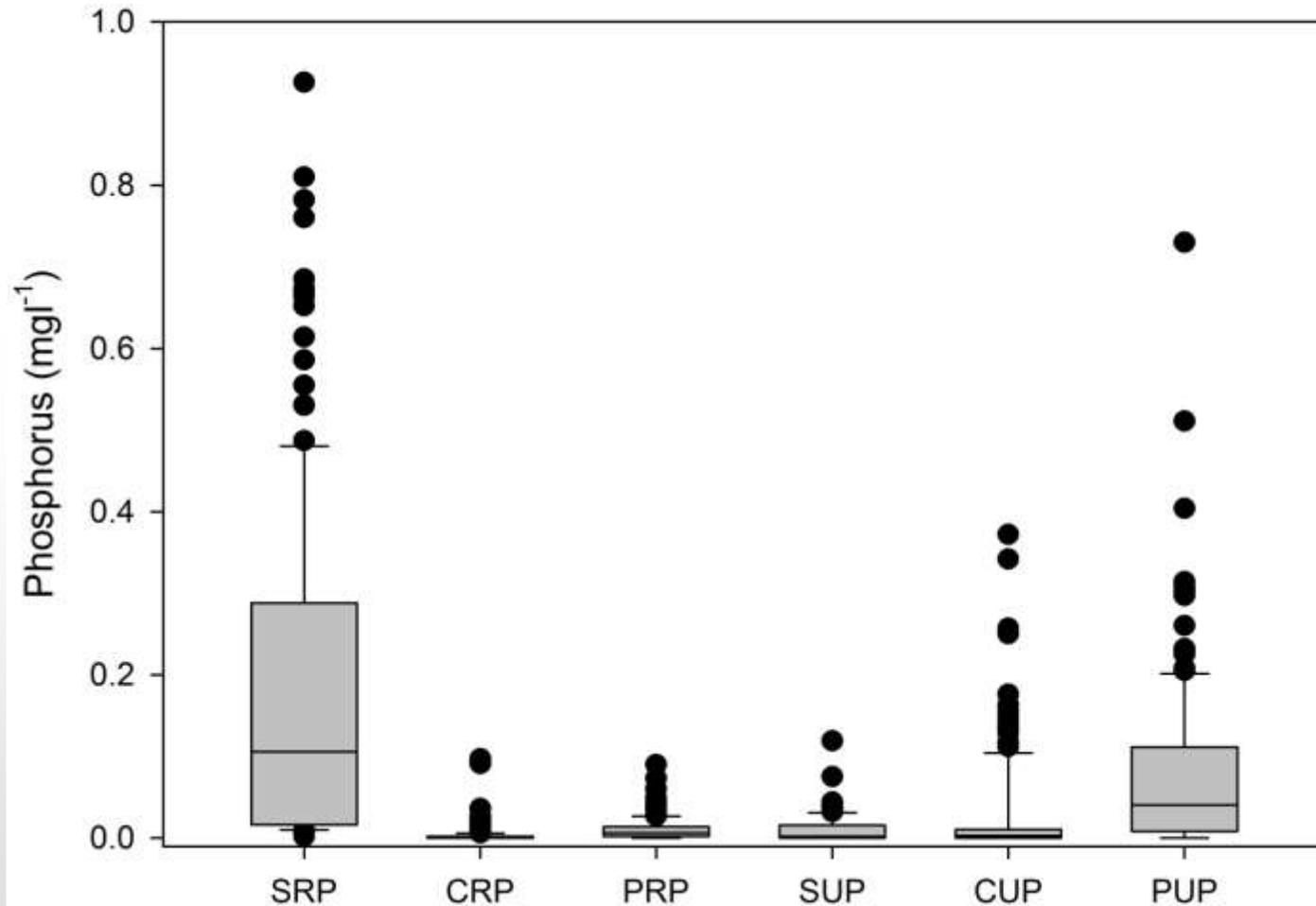
# Upper Candover



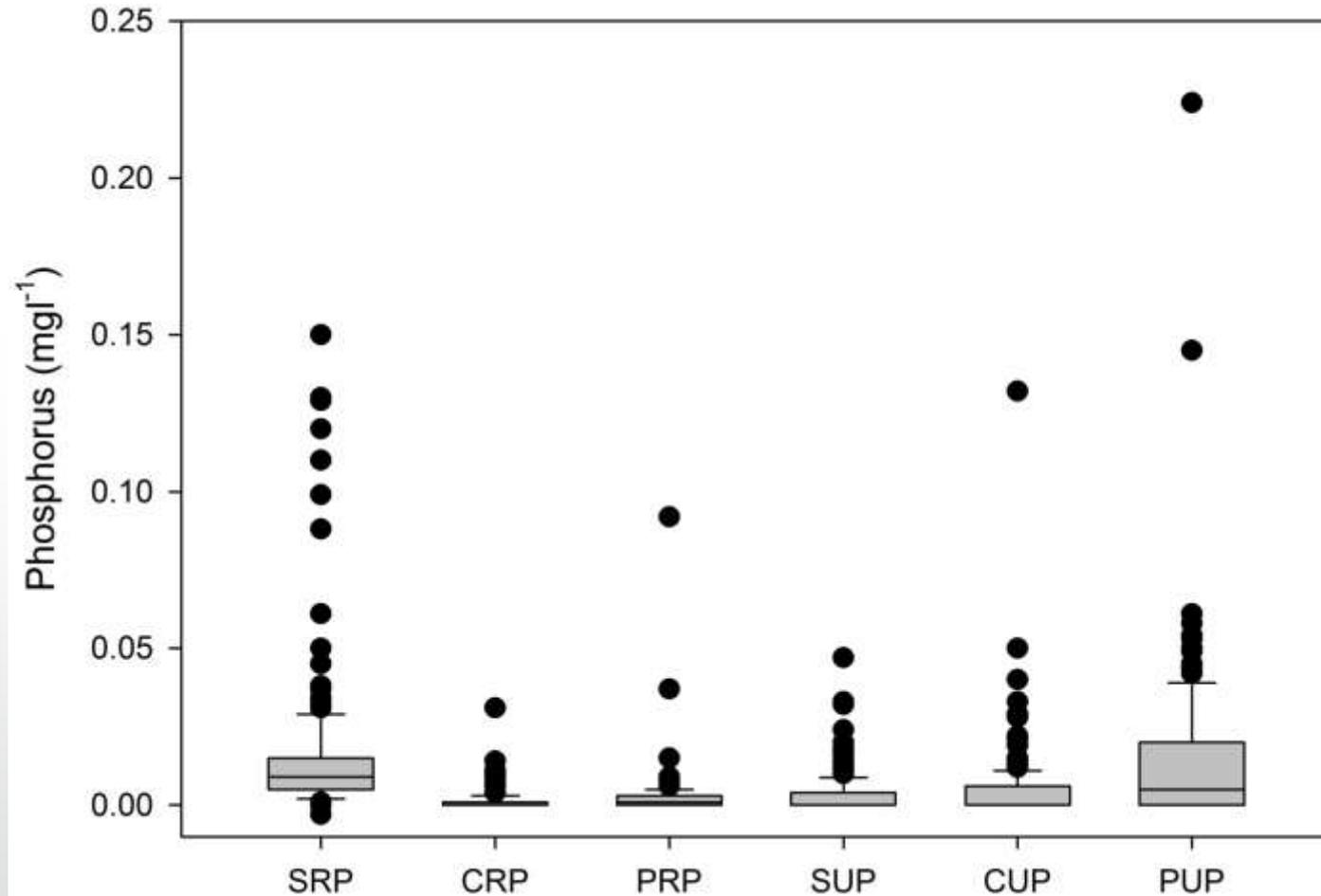
# Mid Candover



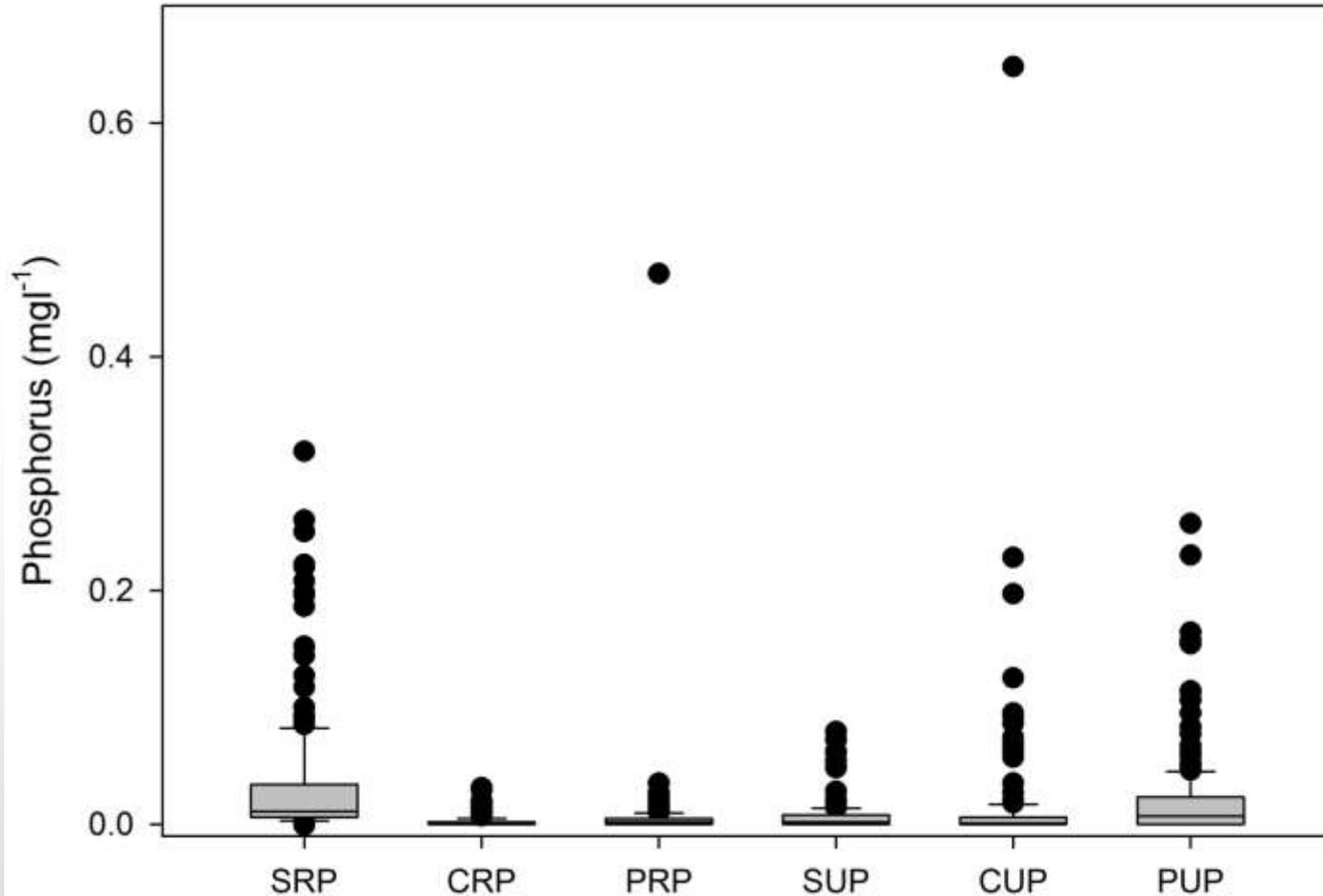
# Itchen Abbas



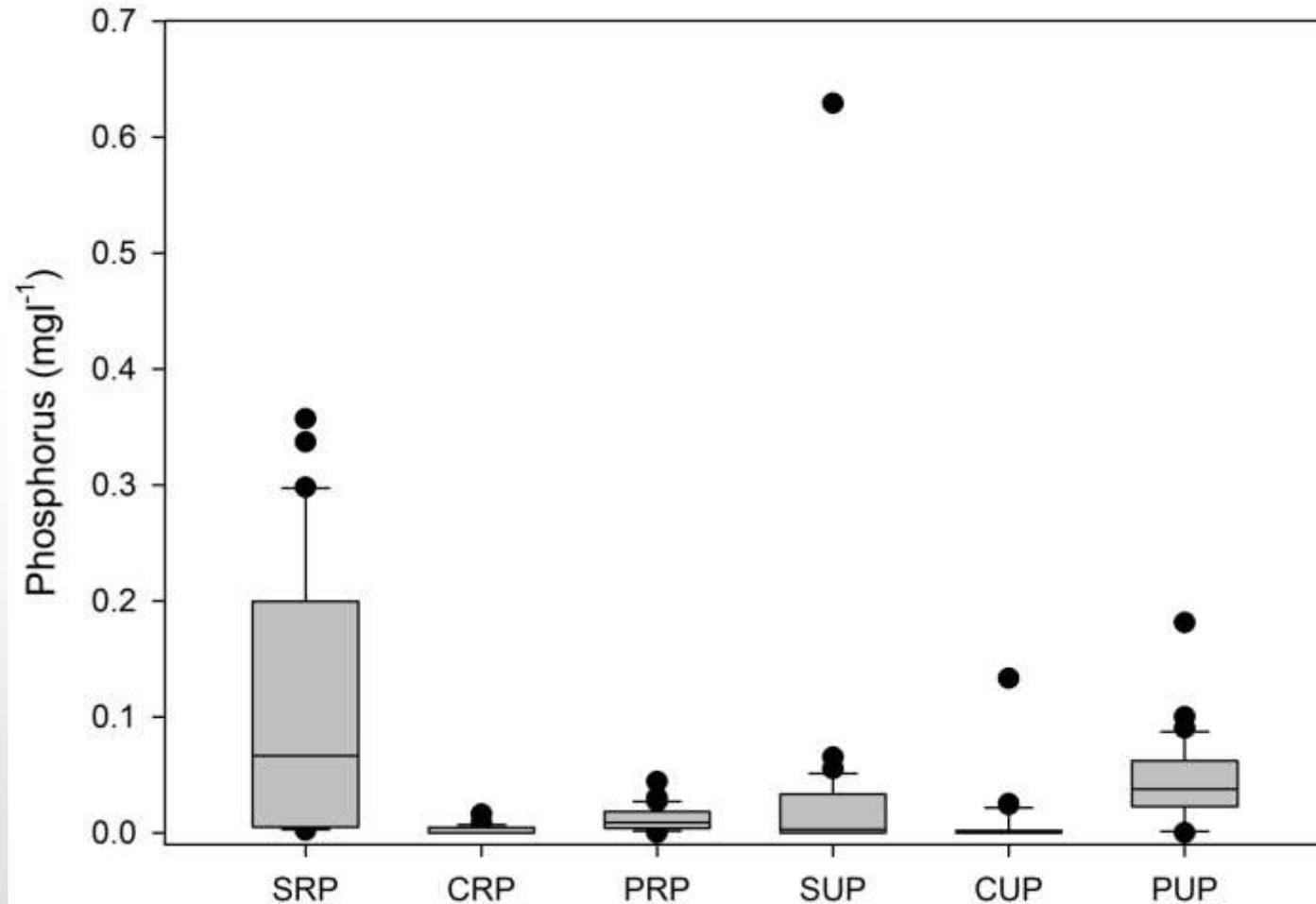
# Sewards Bridge (Tichbourne)



# Drove Lane (Arle)



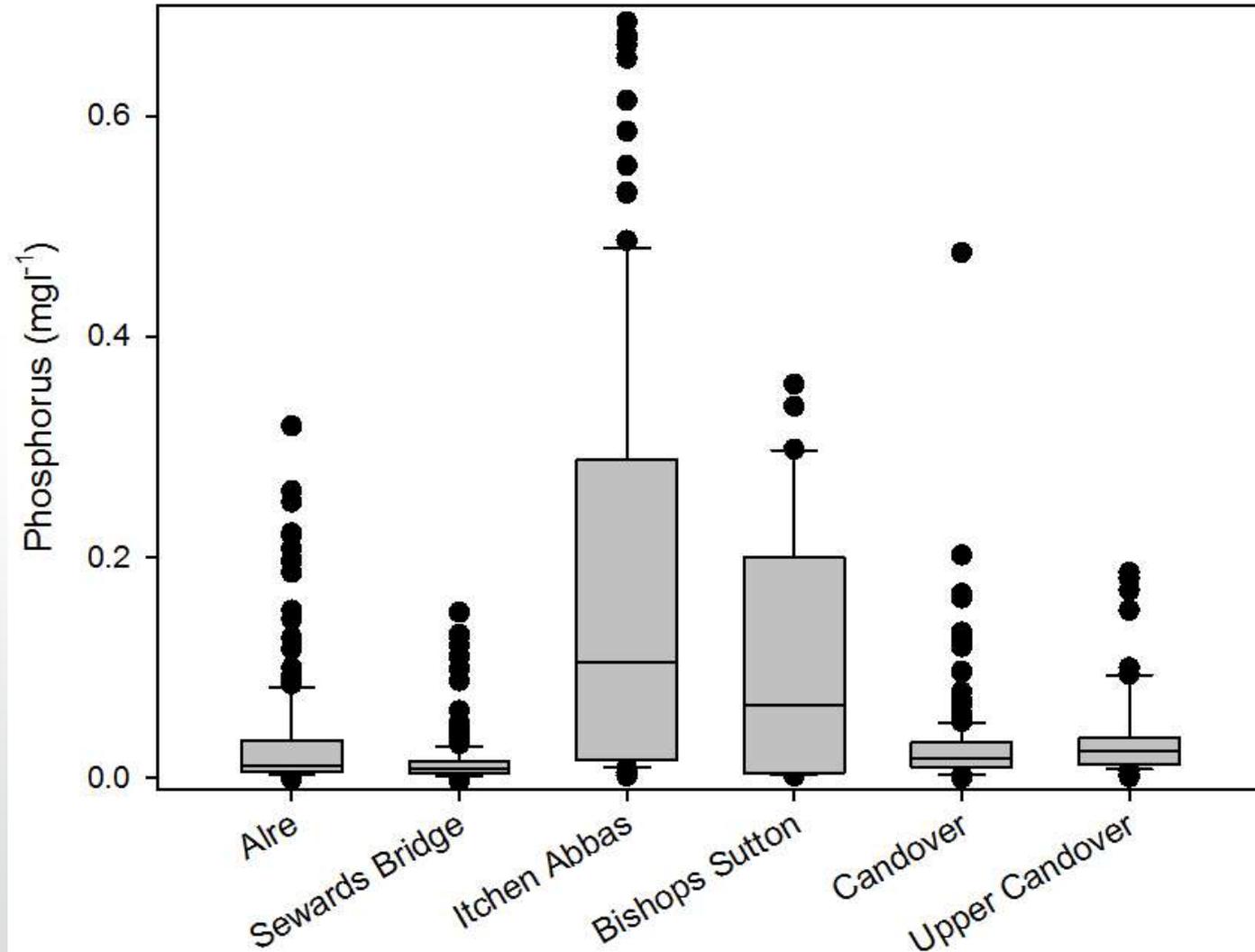
# Bishops Sutton



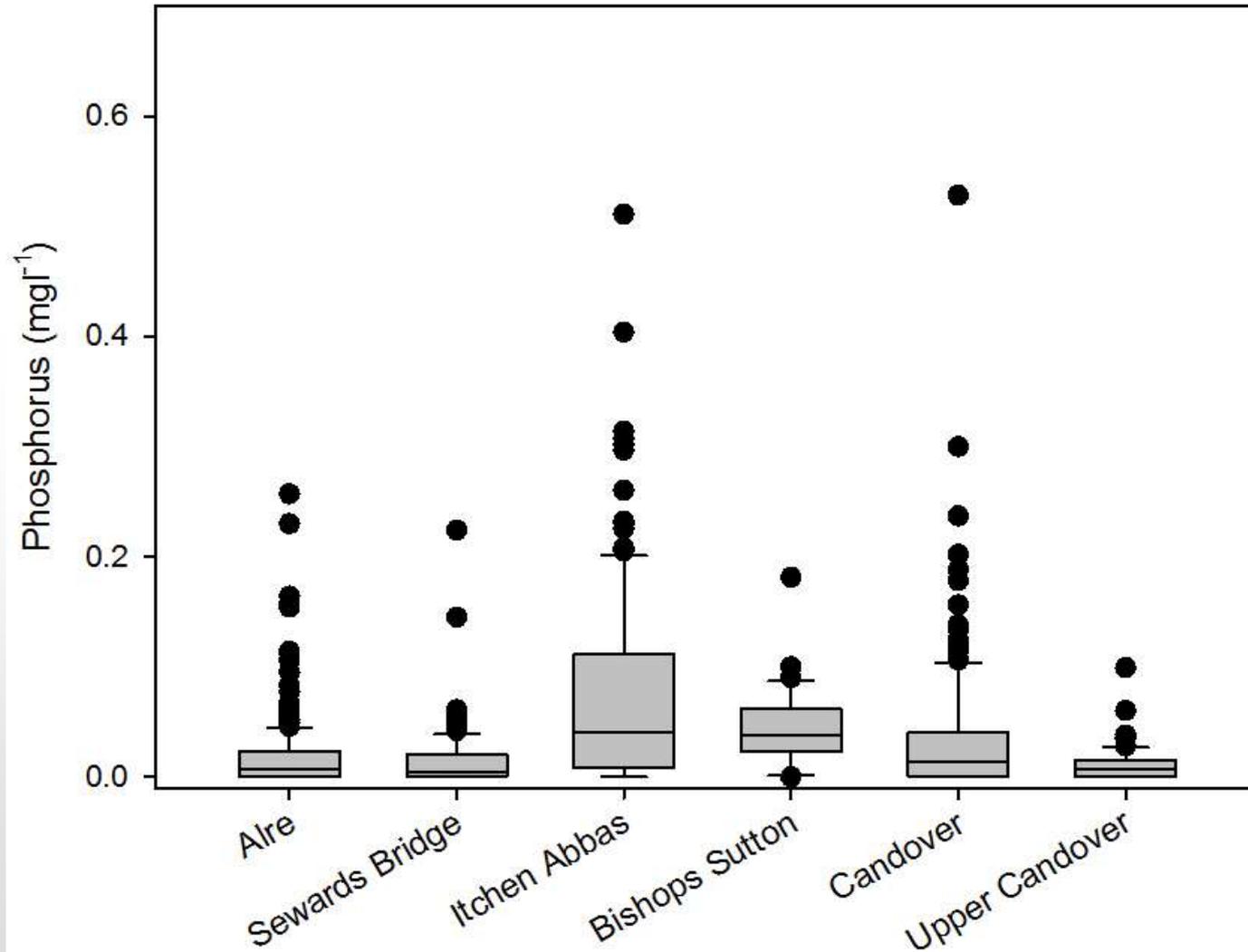
# Key observations

1. Of the reactive P fractions, the soluble is highest; colloidal and particulate reactive P are usually lower. *A “here and now” problem..... depending on season.*
2. Unreactive P is usually dominated by the particulate fraction; colloidal and soluble unreactive are usually small. *Potentially a “legacy” problem, depending on where the particulates go to or get to.*

# Soluble Reactive P (SRP)



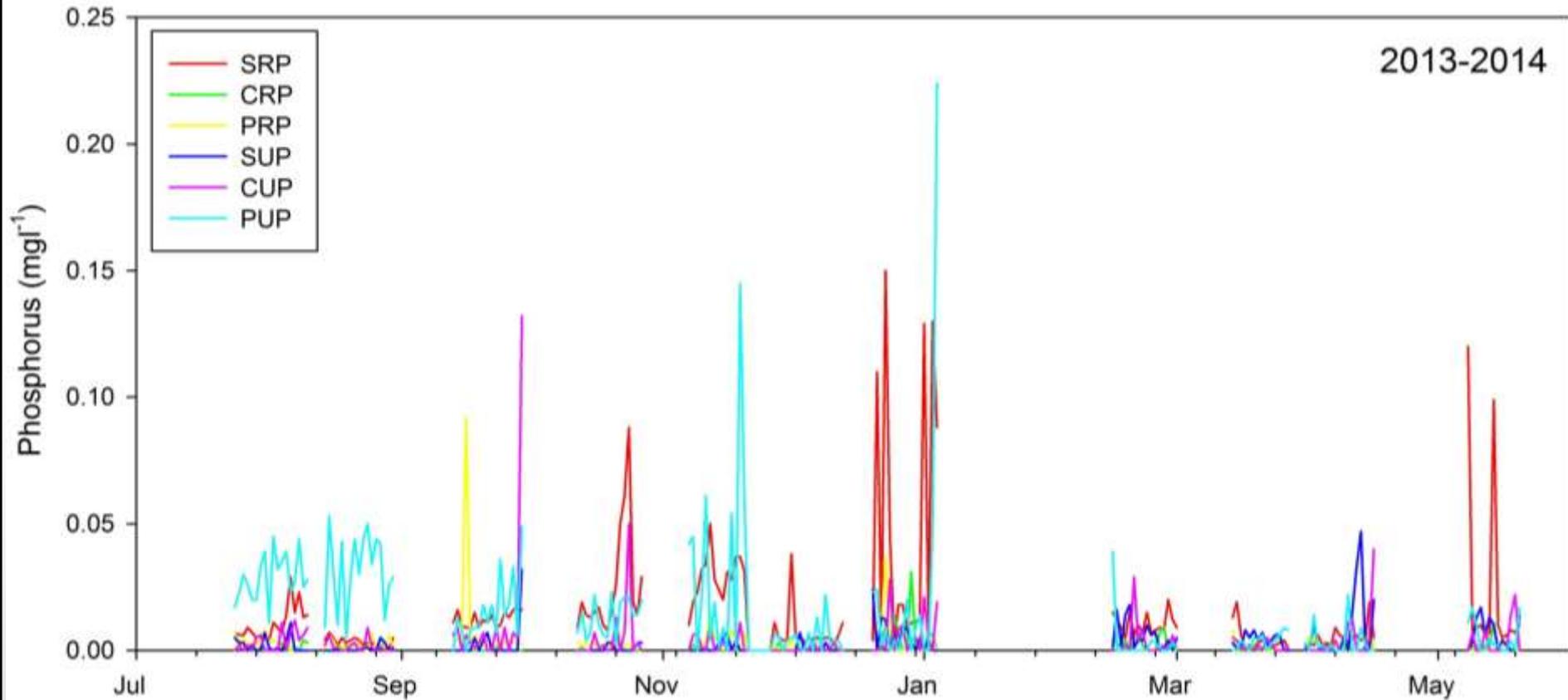
# Particulate Unreactive P (PUP)



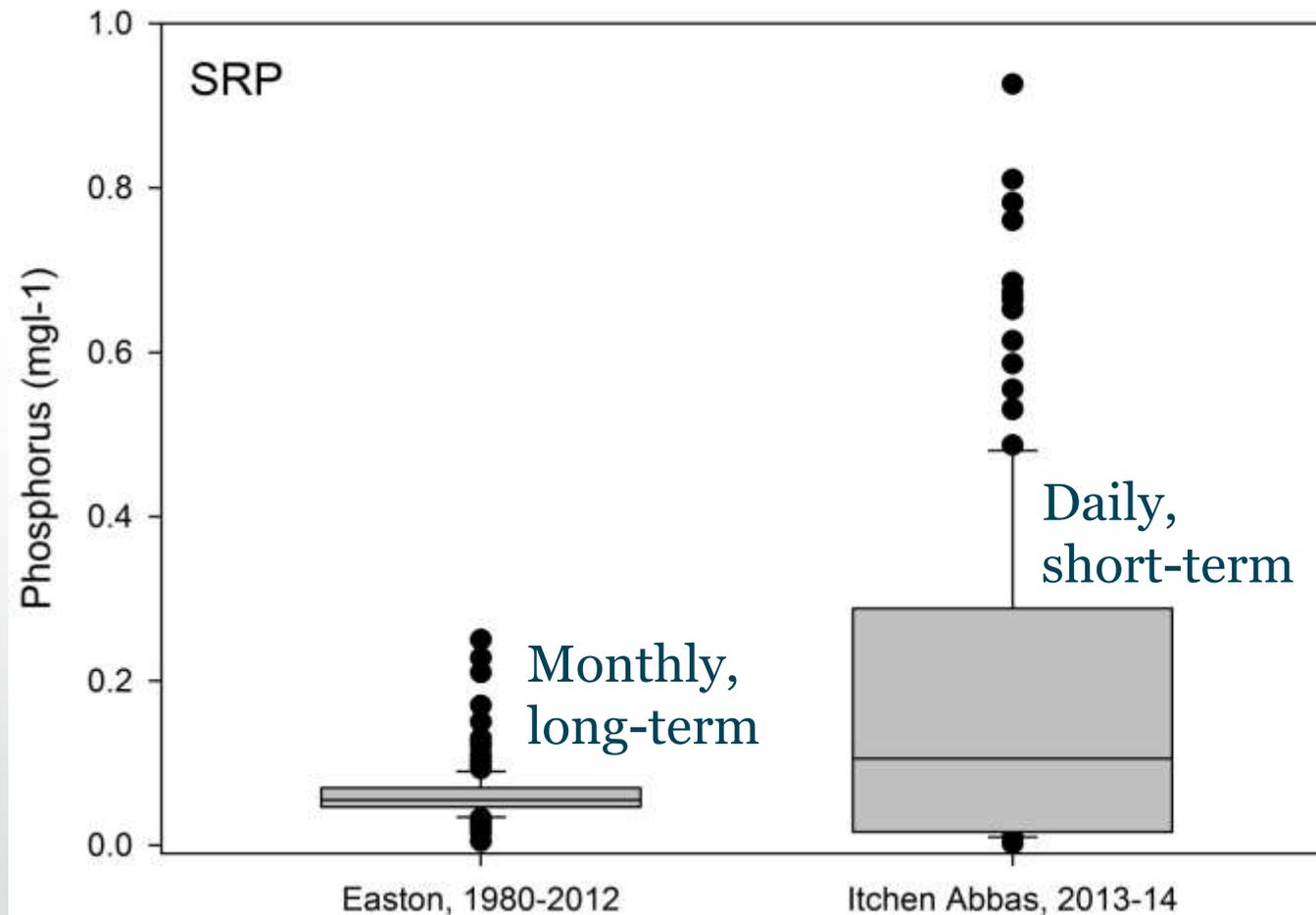
# Site comparisons: observations

1. Bishops Sutton is anomalous; it is supposed to be perennial headwater but is not. Ponding occurs, hence shallow water with organic-rich sediments.
2. Differences between the main Itchen and its tributaries appear more marked than long-term records indicate.

# Changes over time: Swards Bridge



# Differences: main Itchen (SRP)



# Summary

# Summary

Soluble reactive P often accounts for most of the P in samples – but not always. Particulate unreactive P is also important.

All forms of P are **very** highly variable and can be present at high concentrations.

The main Itchen looks worse over the last year than it has over the last three decades when monthly and daily samples are compared.