Bournemouth University

Insights into otter diet from spraint analysis

- Rob Britton, student research teams at Bournemouth University & Pete Reading

Overview

1. Introduction into spraint analysis

2. Analysis of spraints collected in England and Wales (National Otter Survey 2000/01)

3. Analysis of spraints collected in the Hampshire Avon catchment 2014/15

4. Summary

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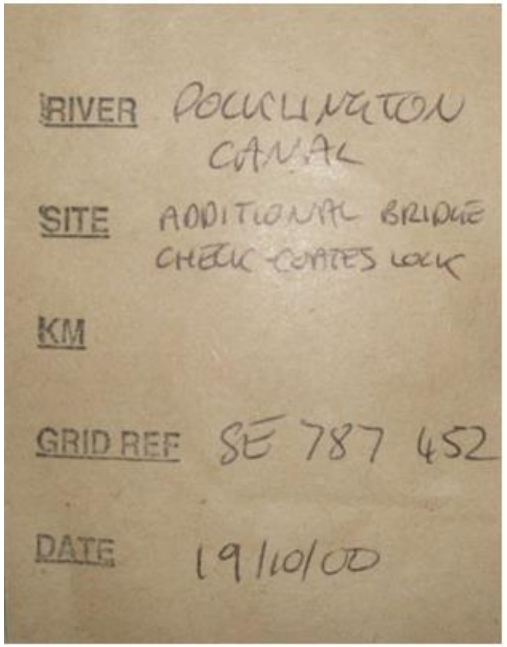
1. Introduction into spraint analysis

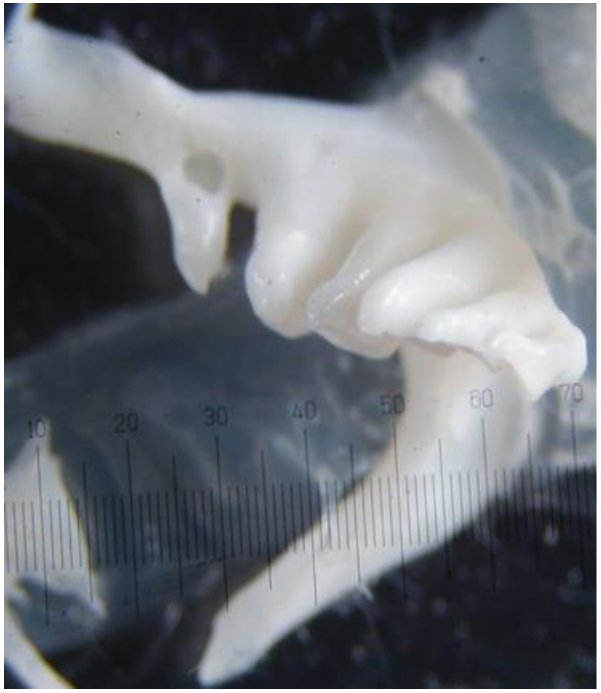
First collect your spraint….

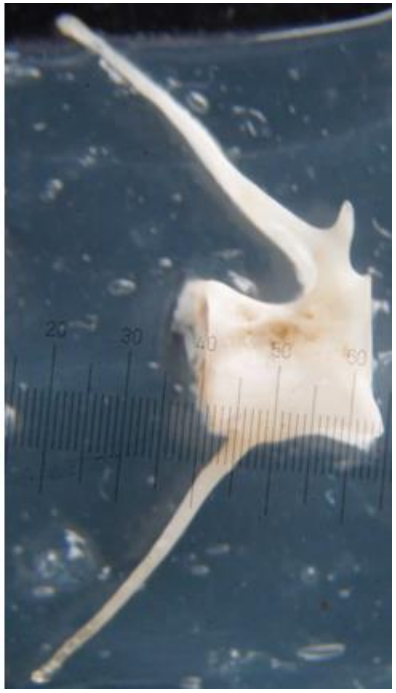
…store it…..


RIVER POCKLINGTON CANAL
SITE ADDITIONAL BRIDGE CHECK COATES LOCK
KM
GRID REF SE 787 452
DATE 19/10/00

Then analyse it….

……use key bones to identify prey items to lowest taxonomic level possible……





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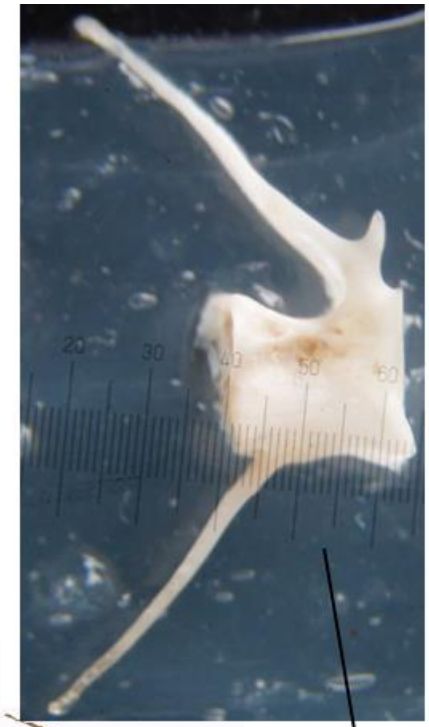

Bullhead Stone loach Salmonid Eel Roach Minnow

Data from spraints

- Depending on when/ how collected, we can (for example):

- Identify the fish taxa generally consumed by otters in that area

- Determine the frequency of those fish taxa in spraints over time and space

- Predict the approximate lengths of the fish

Data from spraints

- We can't:

- Specifically identify where the fish were predated from (at least not easily)

- Use data on the fish consumed as a measure of impact on fish communities more generally

Also…….

Journal of Zoology | ZSL LET'S WORK FOR WILDLIFE

Errors associated with otter *Lutra lutra* faecal analysis. I. Assessing general diet from spraints

D. N. Carss, S. G. Parkinson

First published: February 1996 | https://doi.org/10.1111/j.1469-7998.1996.tb05396.x | Cited by: 46

Studies have highlighted issues with spraint analysis

Feeding captive otters with controlled diets resulted in some fish remains appearing in spraints over several days

So depending on the research question, spraint data have to be used with care…..

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MOLECULAR ECOLOGY

Molecular Ecology (2012) **21**, 1931–1950 doi: 10.1111/j.1365-294X.2011.05403.x

INVITED REVIEW

Who is eating what: diet assessment using next generation sequencing

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- There are alternatives

- But the utility of spraint analysis is arguably their relative simplicity to provide a broad overview of otter diet at a relatively large spatial scale……

Spraint case studies

- Highlight using 2 case studies:

1. Spraints collected in the National Otter Survey of 2000/01

2. Spraints collected from the middle/ lower Hampshire Avon, 2014/15

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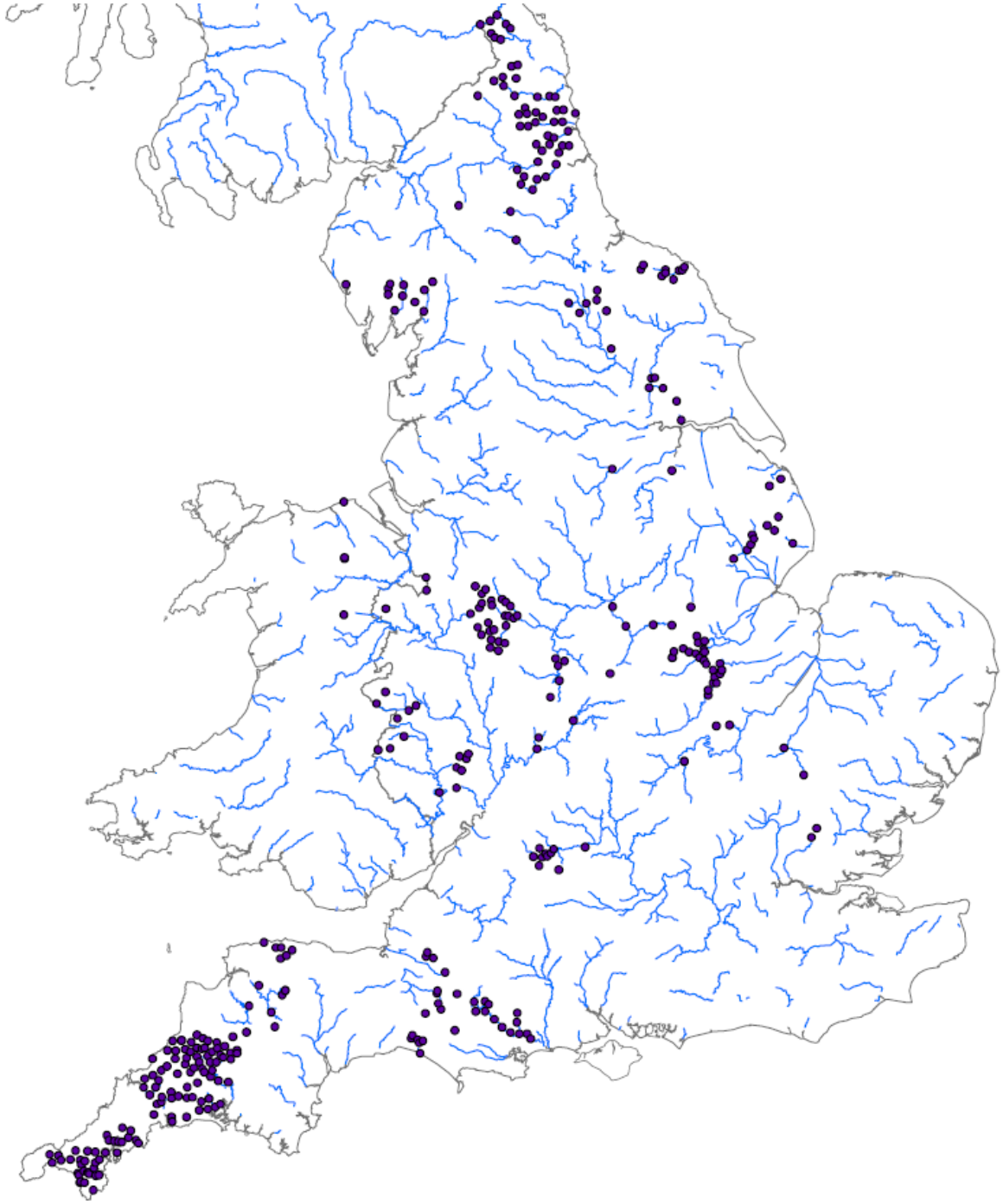
2. Analysis of spraints collected in England and Wales (National Otter Survey 2000/01)

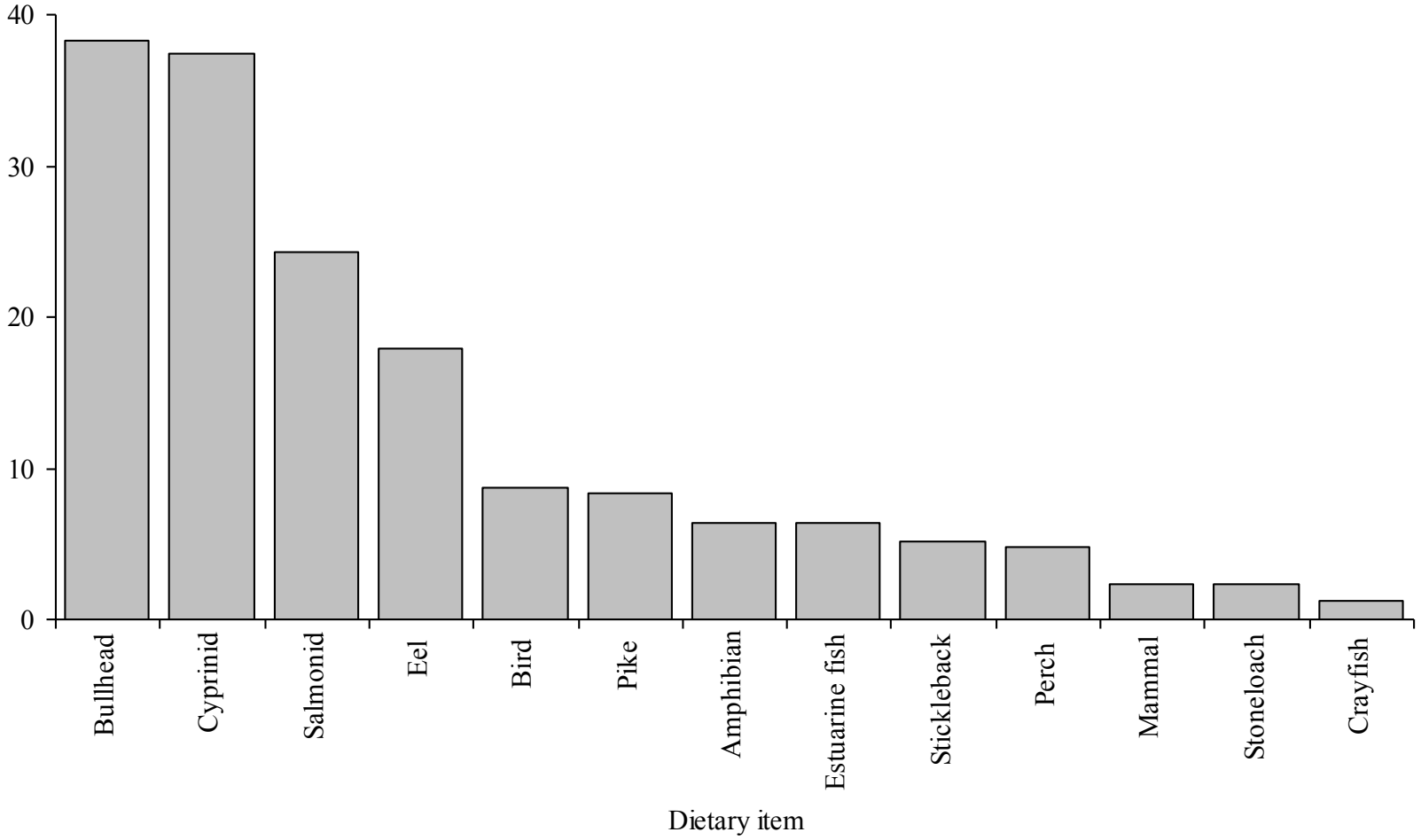
Spraint collection

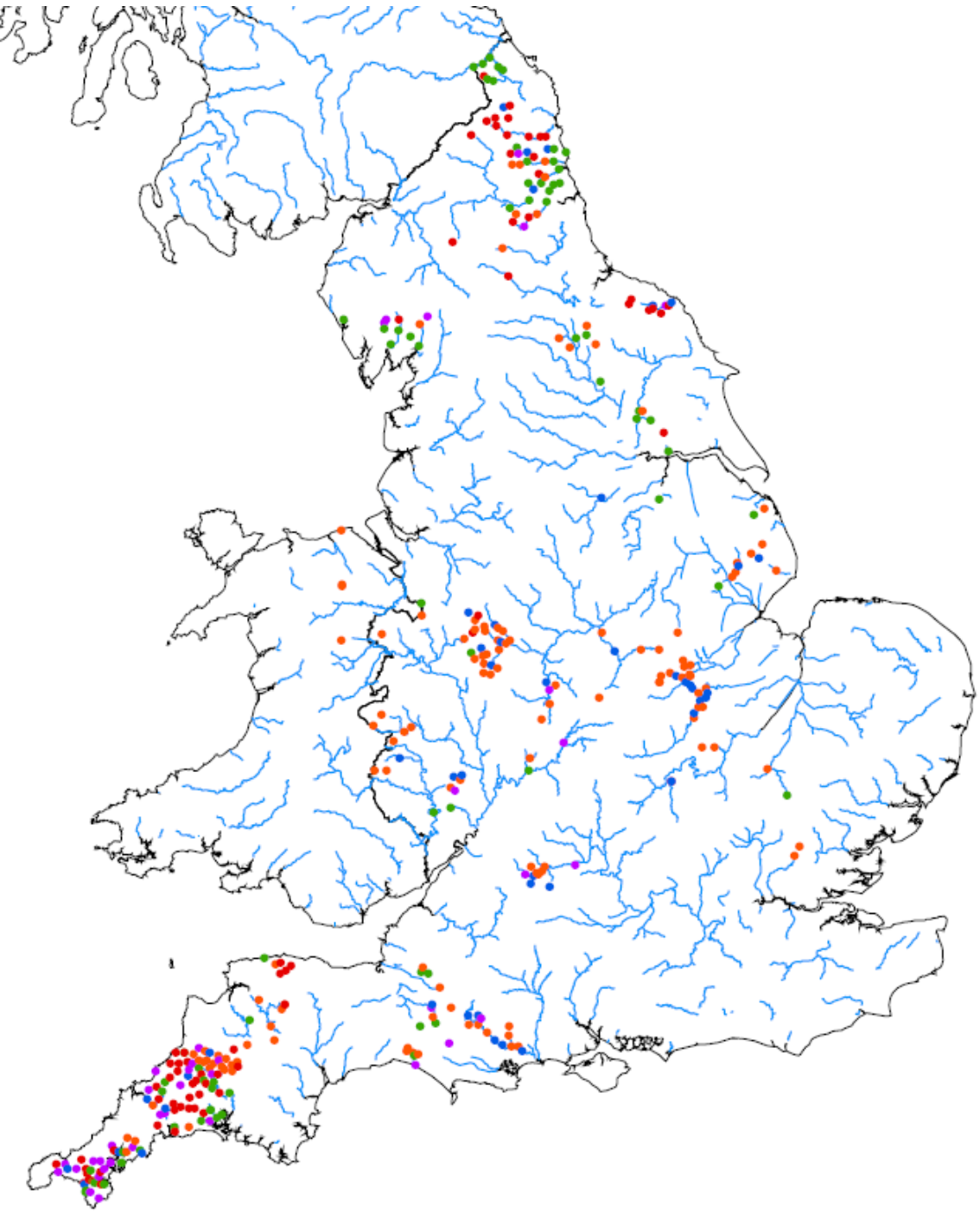
- Access to 350 spraints collected from across England and Wales in 2000/01
- High spatial coverage, but low numbers of spraints in general



1 circle = 1 spraint

Frequency of occurrence of items across all spraints





Analyses identified five main groups of spraints according to their prey:

Red: Salmonid prey

Green: Eel

Blue: Cyprinids

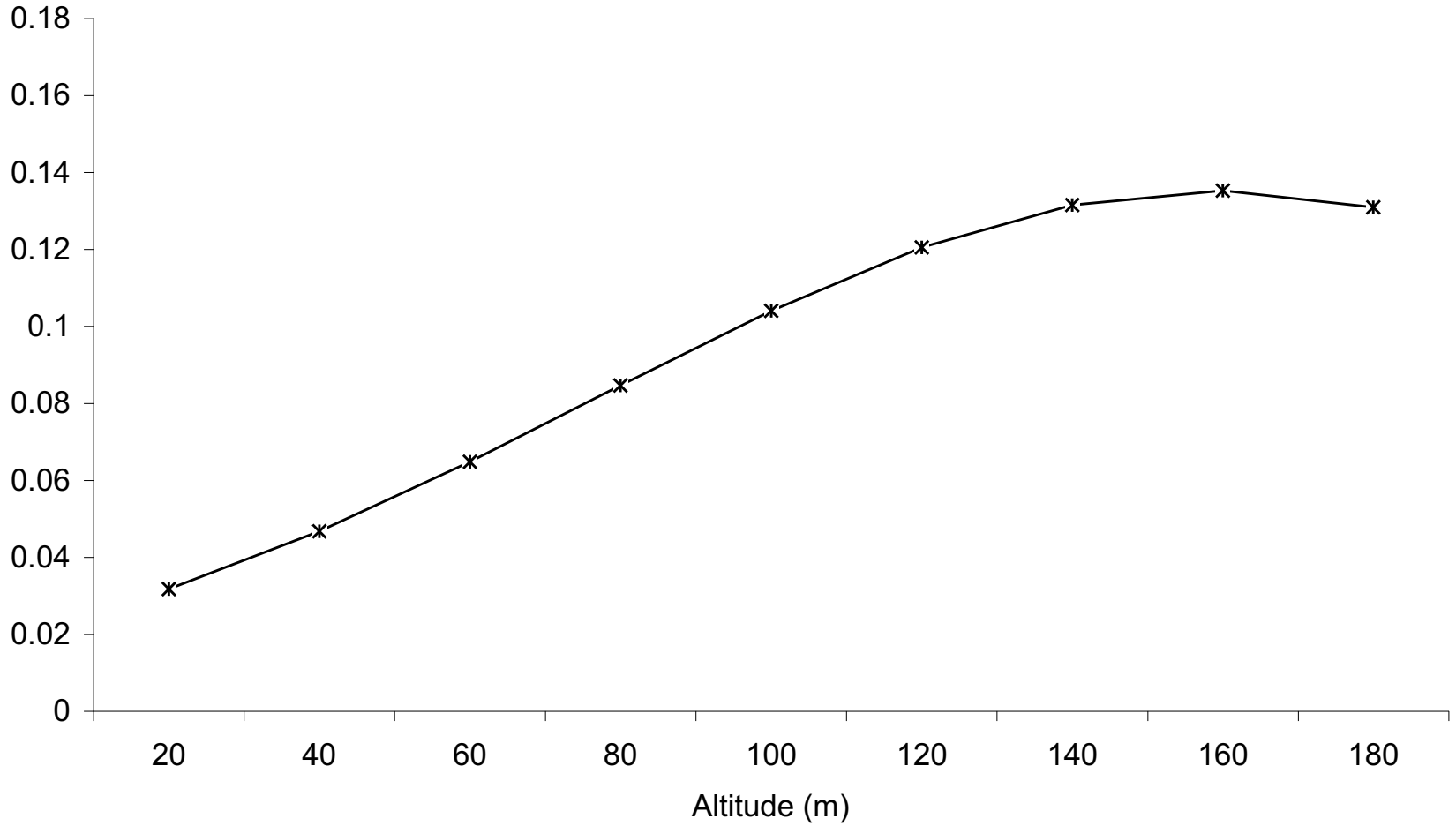
Pink: Non-fish prey

Yellow: Bullhead

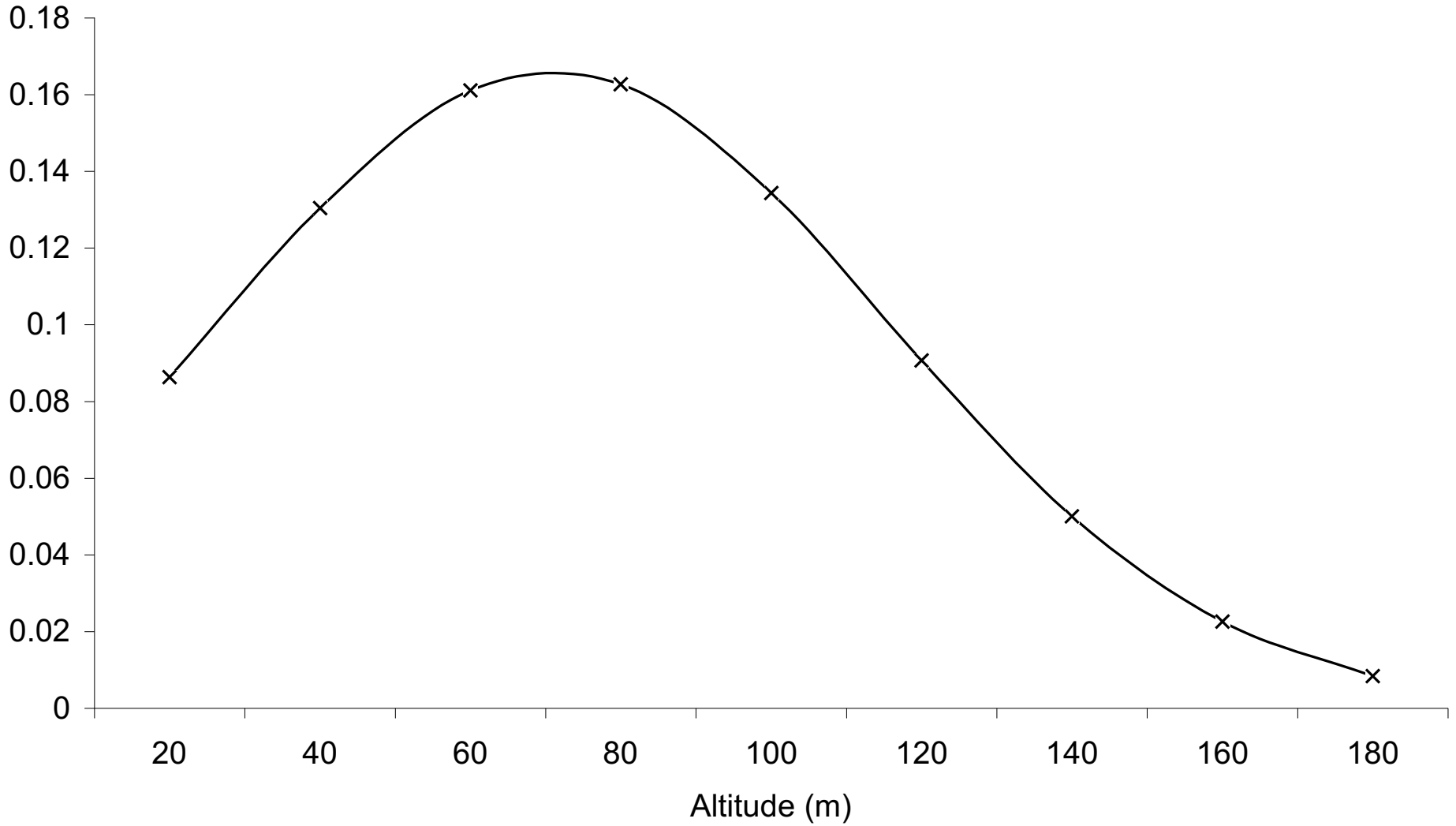
Prey items

- These prey groups were also relatively predictable from where the spraint were collected

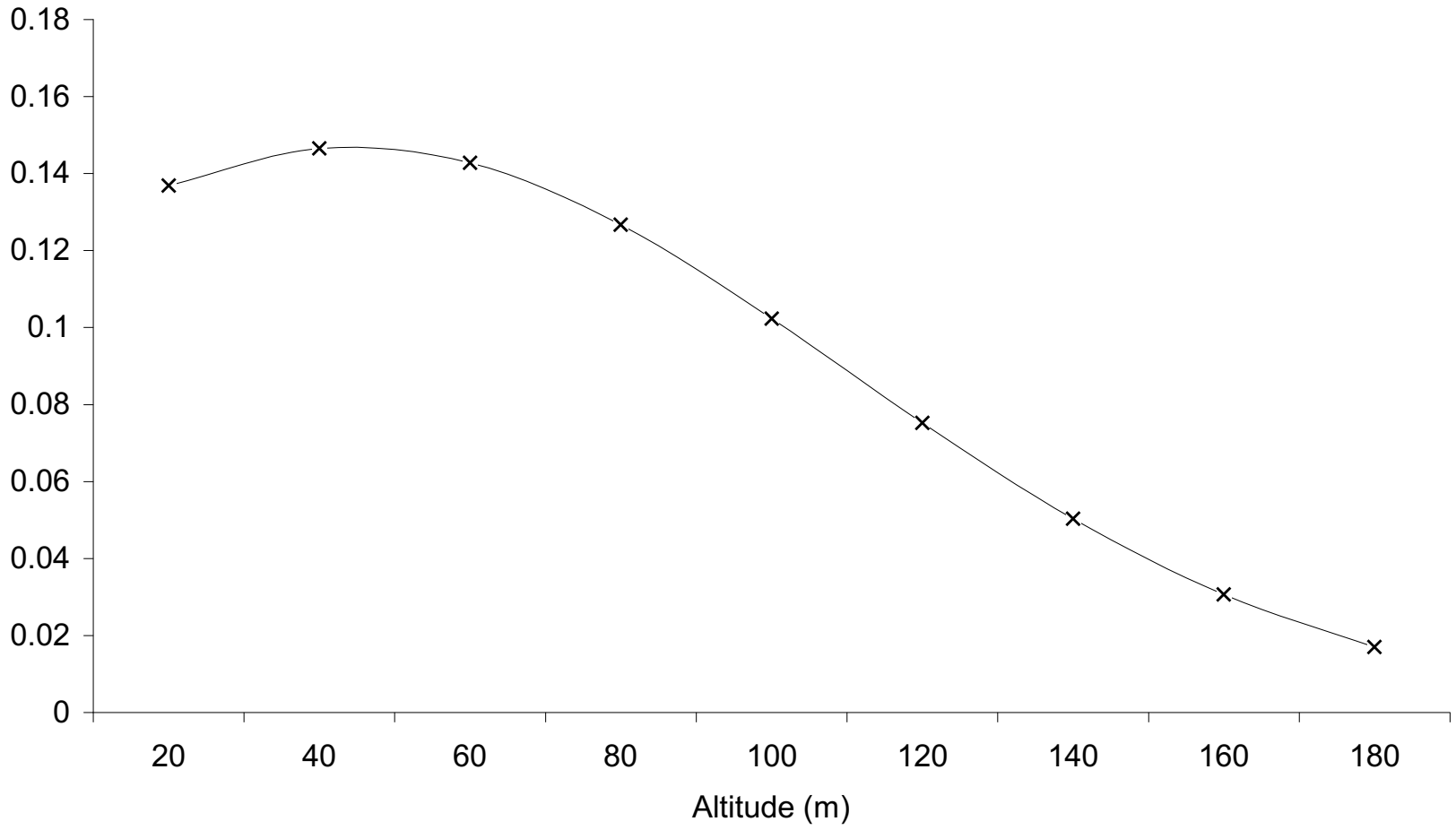
- For example……



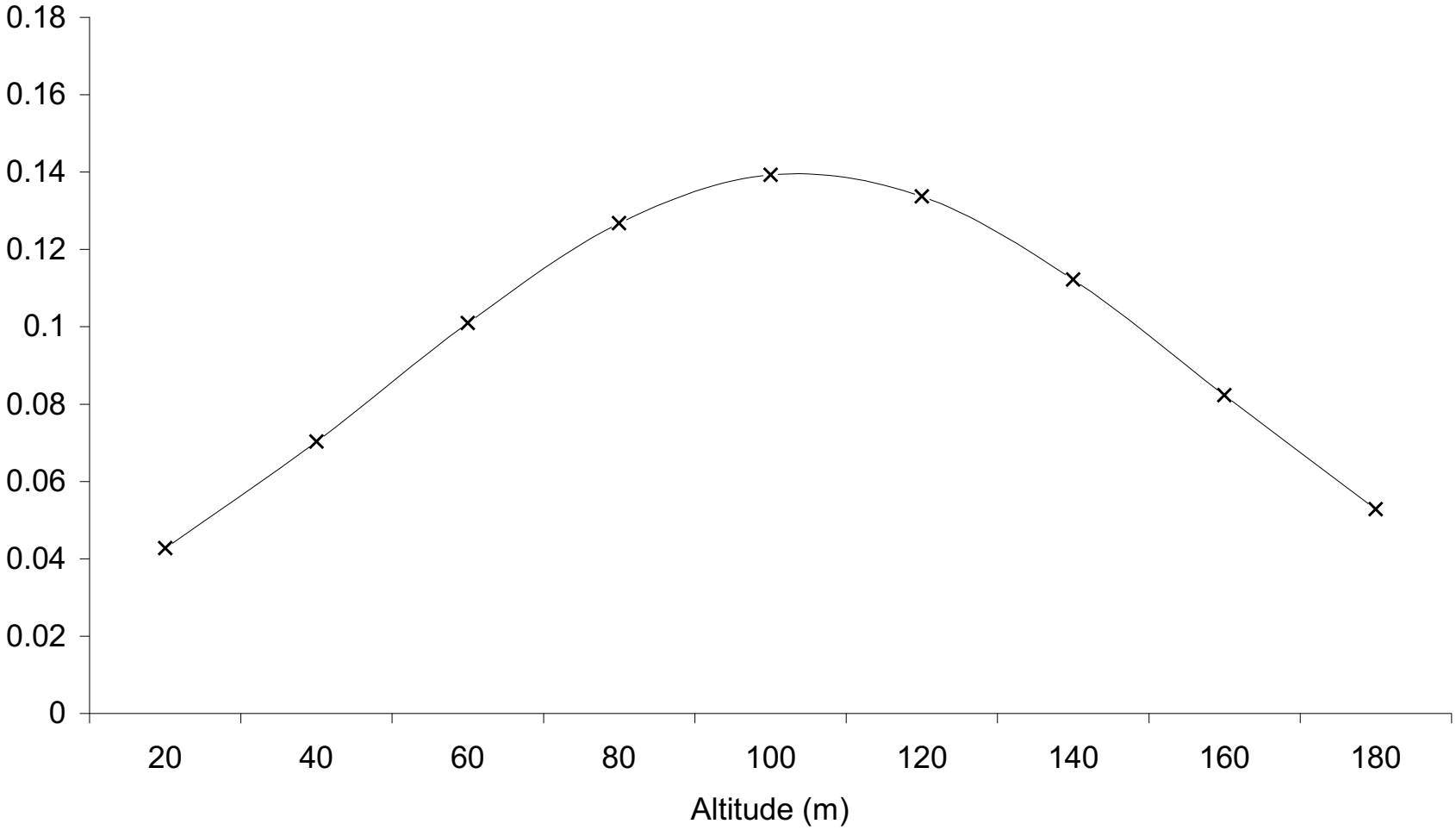
Proportion of spraints with salmonid prey increased with altitude



Proportion of spraints with cyprinid prey mainly at < 100 m altitude



Proportion of spraints with eel mainly at < 100 m altitude



Proportion of spraints with bullheads peaked at around 100 m altitude

Conclusions?

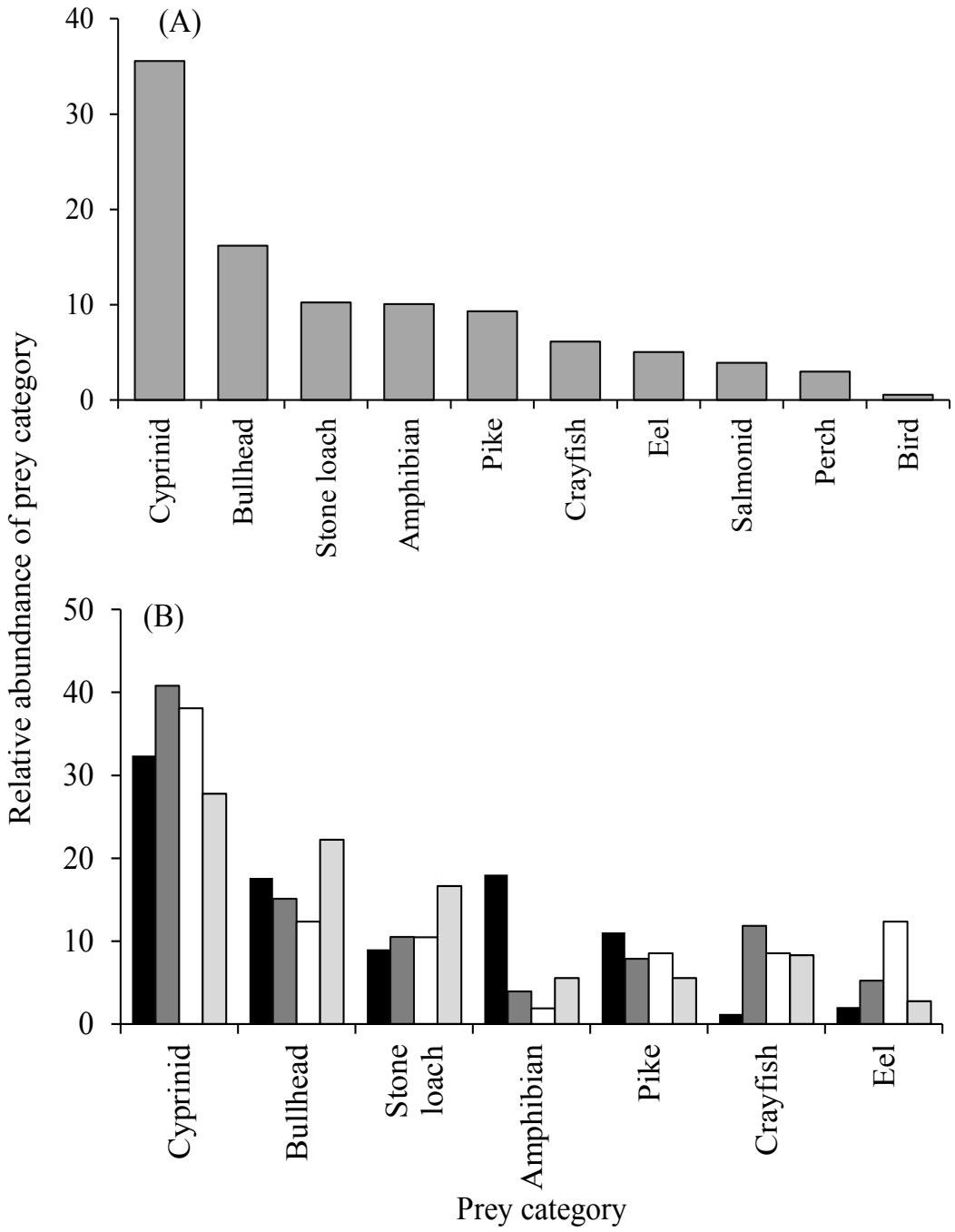
- This snap-shot indicates generalist nature of diet
- Spraints contained prey that were most likely to be found in vicinity of its location
- Note, no comparison here of diet data to data on local fish community composition

3. Otter diet composition in the Hampshire Avon catchment 2014/15

Collection….

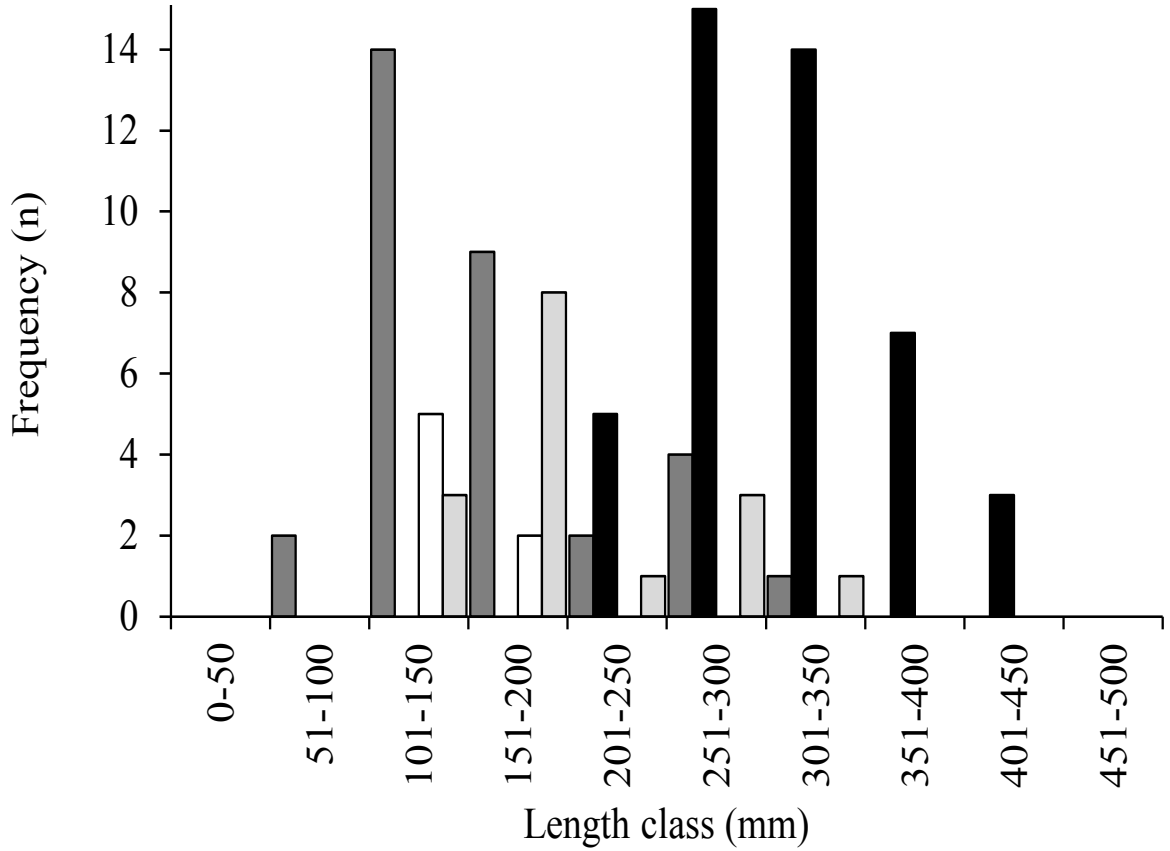
- By Pete Reading
- February 2014 to present
- Here, 150 spraints collected in 2014/15 from 3 reaches of the river, all d/s Salisbury
- Relative proximity of these reaches meant all data combined for analyses


UK
Salisbury
RIVER AVON
N
S1
Fordingbridge
S2
Ibsley
RIVER STOUR
Ringwood
S3
Christchurch
0 2.5 5 10 15 20
Kilometers



A) Relative abundance of major prey items in the spraints

B) Relative abundance of major prey items in the spraints by season



Reconstructed length frequency distribution of fishes identified in the spraints, as identified and estimated from scales.

Dark grey bars: chub *Squalius cephalus* (n = 32)

Clear bars: roach *Rutilus rutilis* (n = 7)

Black bars: pike *Esox lucius* (n = 50)

Light grey bars: *Perca fluviatilis* (n = 16).

Conclusions?

- Fish >30 cm rarely taken
- Larger fish consumed? All pike
- No large chub or barbel scales/ bones found in spraints
- Cyprinids were - most likely – mainly minnows of <60 mm
- Highlighted extent of signal crayfish invasion in the river

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4. Summary

Summary

- Spraint analysis provides a diet composition snap-shot and results should be interpreted with care
- Fish remains in spraints generally from small bodied individuals
- Rare to find larger fish remains in spraints
- Might be an issue with method….otters might be consuming few hard structures from bigger fish….

Summary

….but also cautiously suggests that in general, otter conflicts with anglers are focused on a very small proportion of actual otter diet….

……but I am not dismissing that the presence of otters will not result in the loss of some larger fishes and that these losses are not important…..