Presentations from Citizen Crane Forum

14 October 2015

Held at the
Zoological Society of London

Environmental Protection Team and the Surface Water Outfall Programme

Misconnections on the River Crane – Citizen Crane Forum

14th October 2015

Thames Water

Polluted Surface Water Outfalls

- We estimate there are 300,000 properties misconnected nationally
- We estimate there are 63,000 properties misconnected in the Thames area
- Equivalent nationally of 16 Olympic sized swimming pools flowing into our rivers and stream daily

How the Polluted Surface Water Outfall Programme (PSWO) is shaped

- Delivered by Environmental Protection Team – 5 members (+2), based throughout, passionate, Env. Science backgrounds
- Programme dictated by Environment Agency and Ofwat, EA decide on budget/outfalls per AMP
- Thames Water works on Asset Management Periods (AMP) – each AMP is a 5 year period
- Currently in Year 1 of AMP6, current PSWO Programme is largest ever with biggest delivery profile yet 200 (40/year)
- Waiting List contains all future projects for following year, outfalls continuously re-prioritised to become active
- Priority of outfall (project) relates to condition compared with others on list

AMP 4 and 5 Summary

AMP Totals	Total Number of Properties	Misconnected appliances found	Number of misconnected properties	% Misconnection Rate
AMP 4	120731	4876	2746	2.27
AMP 5	170000	12488	5696	3.35

Example year				
AMP 5 - Year 5	43000	7073	3105	7.22

AMP 5 break down:

- Nearly 170,000 properties visited
- 3.35% of properties found with misconnected appliances
- Most frequent appliance - washing machines (22%)
- Kitchen sinks 2nd (19%)
- Over 750 misconnected toilets found

Snapshot of a SWOP Project

- Post outfall assessment - prioritised from Waiting List or diffuse pollution
- Contractors engaged to map pollution
- Project tendered
- Necessary permits obtained, project raised with CS team
- Administration and on-ground phases
- Rectification follow up, push and involve EHO
- EA sign off
- Projects vary in size 300 – 10,000 properties
- Projects can take between 6 weeks and 2.5 years
- Team currently working on nearly 70 live projects
- North London sees most misconnections = most projects

Thames Water

PSWO Programme Contractors

- Framework Agreement – consists of two contractors, both Engineering consultancies - WERM Ltd and RPS
- WERM Essex based, close to 20 drainage engineers
- RPS Brentford based, 6 drainage engineers
- Will both be branded entirely TW
- Drainage backgrounds, work in field crews of 2, passionate
- Work at alternating times to suit demographic, environment, local traffic, commute.
- Both technical and customer engagement focussed

Contractor Pollution Tracing

- Specialist pollution tracing contractors are engaged
  - Initial site survey, to identify which areas are polluted
  - Extent of this work depends on size of catchment
- Identify properties with misconnections by;
  - Caging
  - Narrowing down
  - Property surveys
    - Customers sent notification letters, informing them we will be working in their area, and that we will probably need to survey their house
    - Check private manholes, and dye test appliances
    - If a misconnection is identified, the problem will be explained on site, then confirmed in a letter
    - Followed up by 2nd letter if no response
    - Handed over for enforcement action
  - CCTV
- Rectification
- Significant improvement
- Environment Agency sign off!

River Crane and related Projects

- EPT currently operating on 3 projects on the River Crane;
  - Crane Park (Hanworth Road)
  - Hospital Bridge North
  - Lyndhurst Avenue
- 2 on Yeading Brook - Lyndhurst Crescent & Cutthroat Woods
- 3 new projects to start in late November;
  - Kingshill Avenue B – near Yeading Brook Meadows
  - Brent Park Industrial Estate – Hayes (South of Minet CP)
  - Roseville Road – Hayes (South of Minet CP)
  - Crane Park (Saxon Road)
  - Crane Park (Water Mill Way)
  - Longford Gardens – Hayes (Minet CP)

Thames Water

Current River Crane Project stats

- 95 misconnected properties
- 66 properties rectified
- 6 properties currently with EHO
- Included 15 toilets, 57 washing machines, 44 hand basins and 41 kitchen sinks
- Hospital Bridge North
  - 10 misconnected properties
  - 6 washing machines, 2 kitchen sinks, 1 toilet, 6 hand basins, 1 shower and 1 bath
  - Effort to get all rectified with customer and EHO
  - Due for EA sign off end of Sep
  - New pollution present
  - Investigation works starting again

Thames Water

Project challenges we face

Customer

- No knowledge on misconnections or drainage
- Lack of environmental awareness or consideration
- Unwilling to cooperate and comply
- New connections

Physical

- Operational and logistical challenges (cars, roads, blind connections, absent landowners, tracing time, sewer breaks)

Local Authority

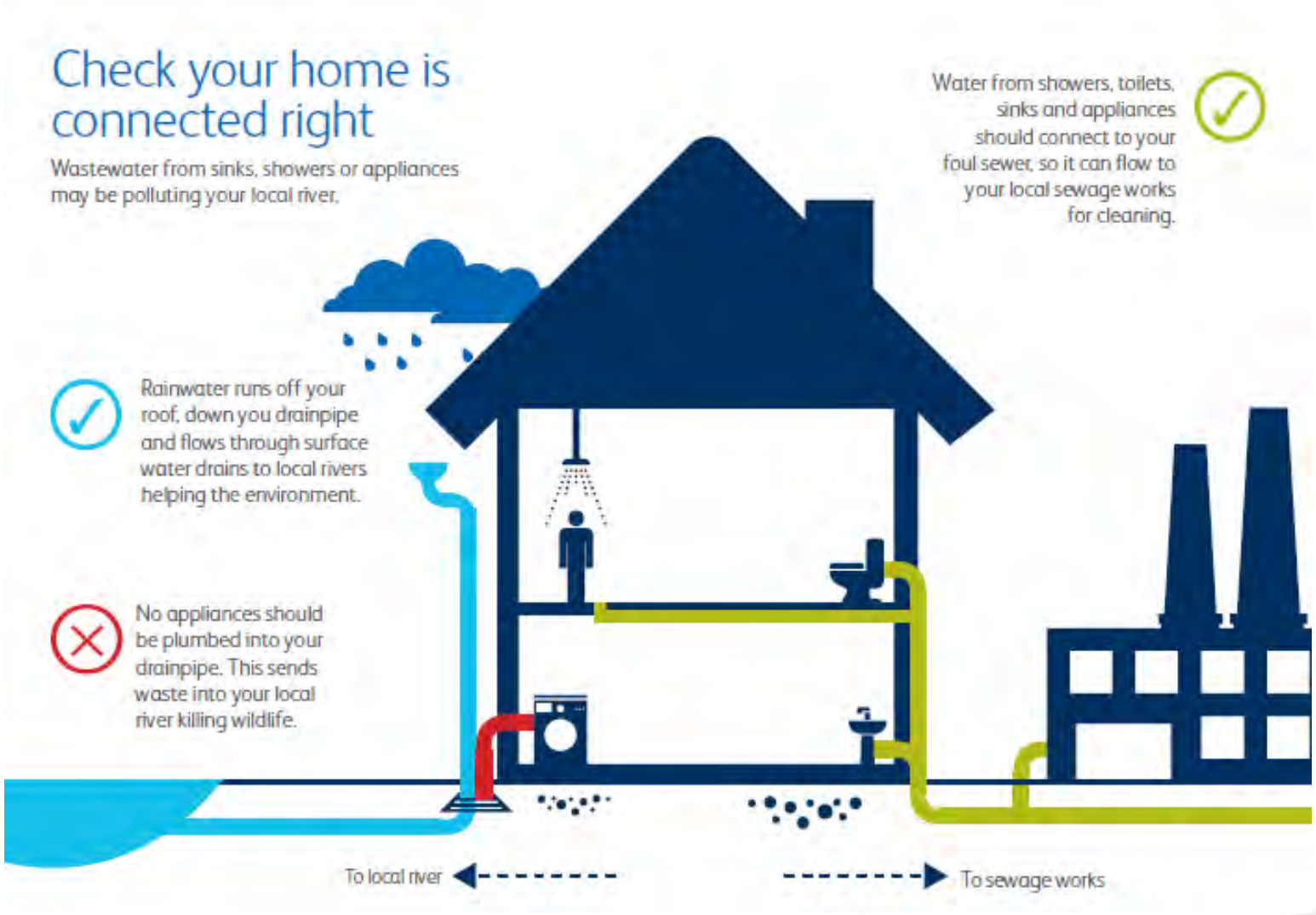
- Non compliant landowners handed to LA (EHO)
- Local authorities have a duty under section 59 of the Building Act 1984 to serve notice on owners of premises that have unsatisfactory drainage
- Responsiveness of EHO's can be slow

Citizen Crane and the PWSO Programme

- Continued sample effort – Phosphate and RMI (provides good indicator) - WFD
- Post project outfall monitoring – not a TW resource
- Monthly WQ sampling – could focus on live SWOP
- Report significantly high outfalls readings
- Passive surveillance for PI's and fly tipping

- Where possible, we need to EDUCATE

How drains should be connected



A few customers are very confused about how their waste pipes should be connected

Citizen Crane and the PWSO Programme

- CC has the numbers, a tool TW don't have
- Networks with community, LA and other groups important
- Raise awareness through various platforms, social media, mail-outs, field days etc, FORCE FB a great example
- Local community, schools, stakeholders (HCF)
- Academic involvement fantastic – providing depth to data and raising RC and CC profile
- FOG and wet wipes = major problem

Thank you.

Thames Water

Environment Agency

Pollution Incidents in the Crane Catchment

Amanda MacLean
Crane Catchment Coordinator
Oct 2015

Freephone from landline or mobile:

0800 80 70 60

- Where is it?
- Is the water discoloured?
- Is there an odour?
- How big is the area affected?
- Have you seen any dead or distressed fish or other wildlife?

- What is the cause of the problem/where is the pollution entering the stream?
- Has this ever happened before?
- Do you have any pictures?
- Your contact details

Environment Agency

Working hours

Out of hours

Production Database - Event 01330730

Help

OK

Agency Impact | Env. Impact | Water | Fisheries | Source Type/Sector | Pollutant | Details | R

Incident substantiated

Agency action mini

Impact on Water

- [ ] No Impact
- [ ] Minimal effect on water quality
- [ ] Minor damage to ecology
- [ ] Minor effect on amenity value
- [ ] Minimal damage to agriculture / commerce
- [ ] Minimal effect on human health
- [ ] Minor effect on a potable abstraction
- [x] Significant effect on water quality
- [ ] Significant damage to ecology
- [ ] Significant effect on a potable abstraction
- [ ] Significant effect on amenity value
- [ ] Significant effect on human health
- [ ] Significant damage to agriculture / commerce
- [ ] Serious effect on human health
- [ ] Major effect on water quality
- [ ] Major damage to ecology
- [ ] Major effect on a potable abstraction
- [ ] Major effect on amenity value
- [ ] Major damage to agriculture / commerce

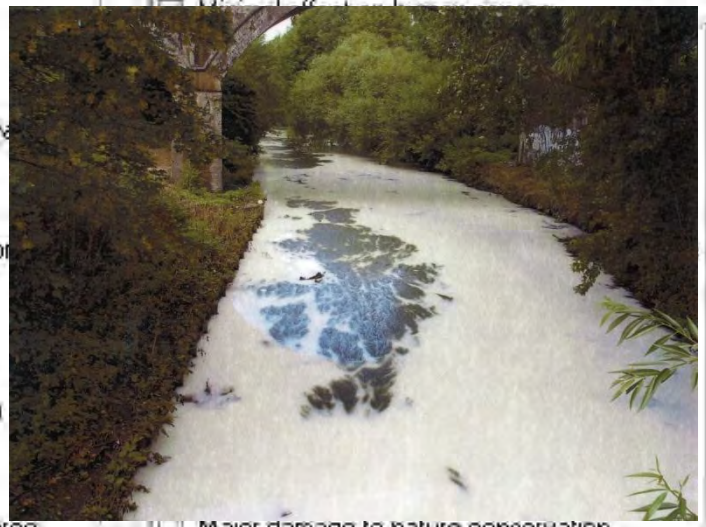
Water Impact Category 4

Water Impact Category 3

Water Impact Category 2

Water Impact Category 1

- [ ] Minimal effect on human health
- [ ] Minor impact on property
- [ ] Significant damage to agriculture / co
- [ ] Significant effect on human health
- [ ] Serious effect on human health
- [ ] Major effect on amenity value
- [ ] Major damage to agriculture / commerce



- [ ] Major damage to nature conservation

Water Impact Category: Level 2

Land Impact Category: Level 4

Air Impact Category: Level 4

Team: HNL Area (Read Only)

User: Amanda MacLean

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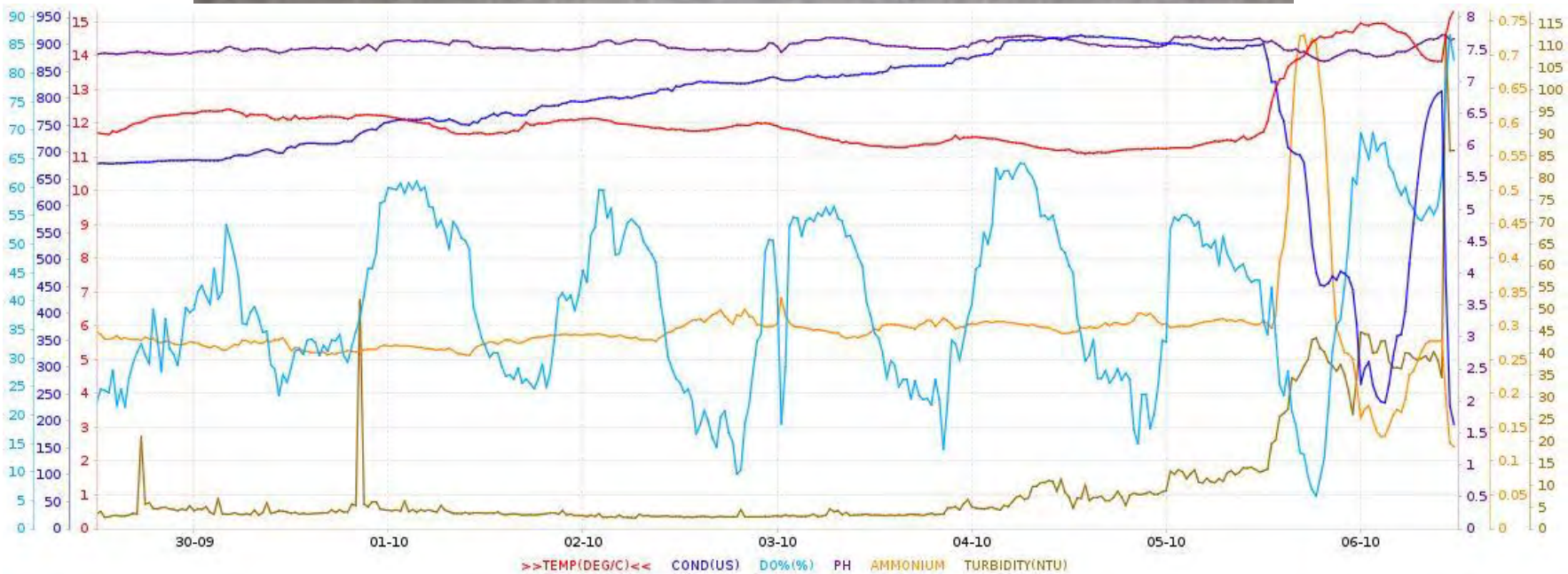

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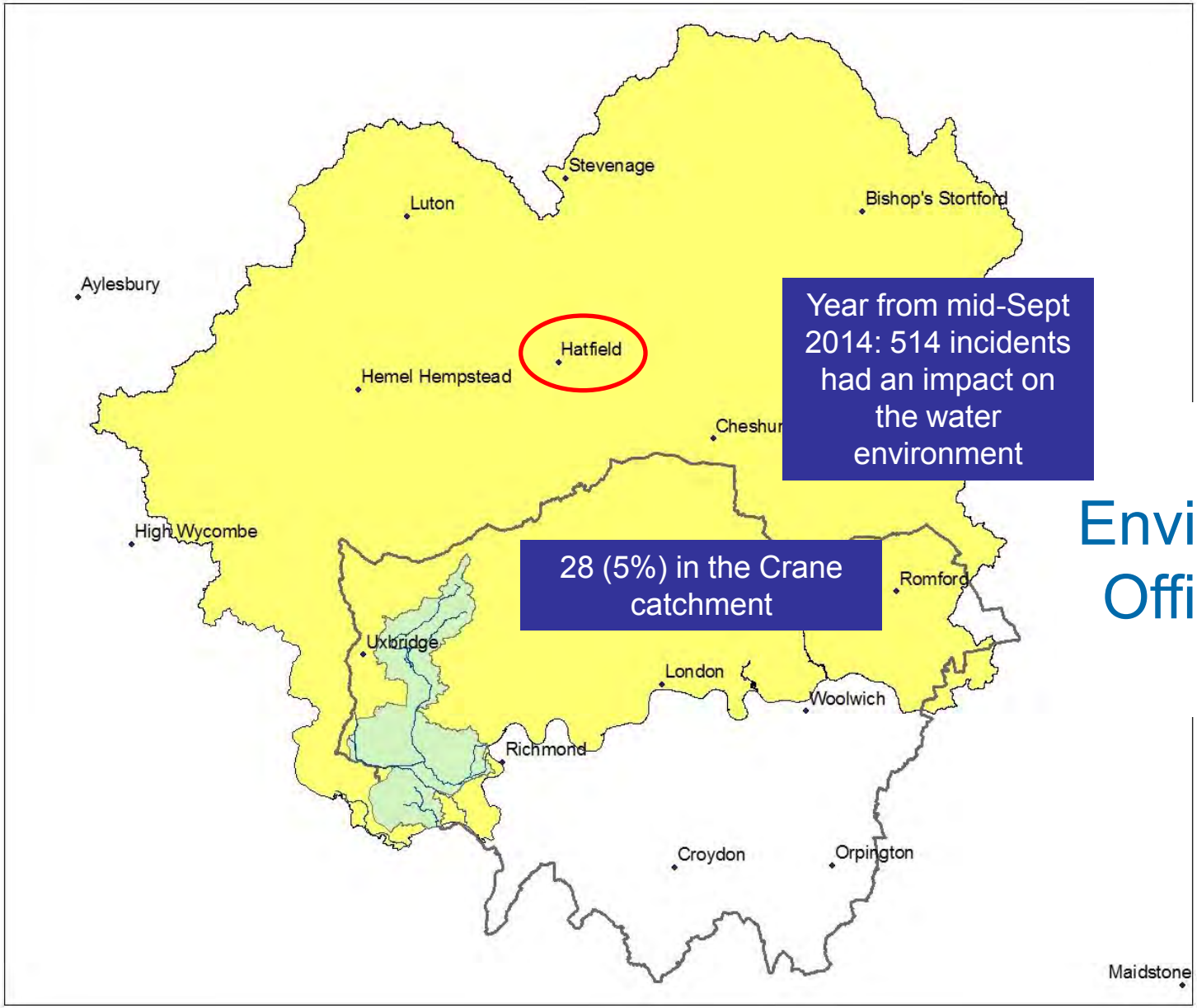

Year from mid-Sept 2014: 514 incidents had an impact on the water environment

28 (5%) in the Crane catchment

Environment Agency

Legend

- Rivers
- Crane Catchment
- Greater London
- Herts & N London Area

3 Environment Officers on call

0 5 10 15 km

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Crane Catchment

Pollution Incidents 14/09/2014-13/09/2015

Environmental Impact, Type of Pollutant

- Category 1 (Major),
- Category 2 (Significant), Other Contaminated Water
- Category 3 (Minor), Crude Sewage
- Category 3 (Minor), Firefighting Run-Off
- Category 3 (Minor), Grey Water
- Category 3 (Minor), Mixed/Waste Oils
- Category 3 (Minor), Not Identified
- Category 3 (Minor), Other Sewage Material
- Category 3 (Minor), Unidentified Oil

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Example 1:

- Call to hotline: ‘Water coming from a pipe looks very cloudy, there was no smell but I was a few feet away. There’s no affected wildlife or dead fish, the water is affected just by the outlet pipe.’

- Duty officer:
  - rang reporter to clarify location and severity
  - asked water company to attend at first light on following day
- Water company:
  - blockage crew traced to 2 surface water outfalls which are believed to be misconnected
  - outfall sandbagged off
  - sewers cleaned

Example 2

- Call to hotline: ‘Water is pale brown and scummy, with sewage and toilet paper and it smells of faecal matter running downstream 1/3 of the river width. No dead or distressed fish or other wildlife.’

- Duty officer:
  - Sent Environment Officer and water company to attend that day
- Environment Officer and water company:
  - Found outfall looked slightly grey but water clear
  - Suspected misconnection - water company to investigate

Example 3

- Call to hotline: ‘Looks like petrol. It is causing rainbow puddles as it goes under the bridge. The smell is overpowering, like paint thinner.’

- Duty officer:
  - Called reporter for more info – liquid smelling of petrol had been coming through for at least half an hour
  - Asked Environment Officer and Operations team to attend
- Operations team
  - Installed absorbent booms and pads

- Environment Officer:
  - Followed pollution upstream as far as an outfall
  - Worked with water company to lift manholes along surface water sewer
  - 3 days to trace to construction site – found contaminated soil not stored correctly
  - Required to service interceptor asap
  - Warning letter

Freephone from landline or mobile:

0800 80 70 60

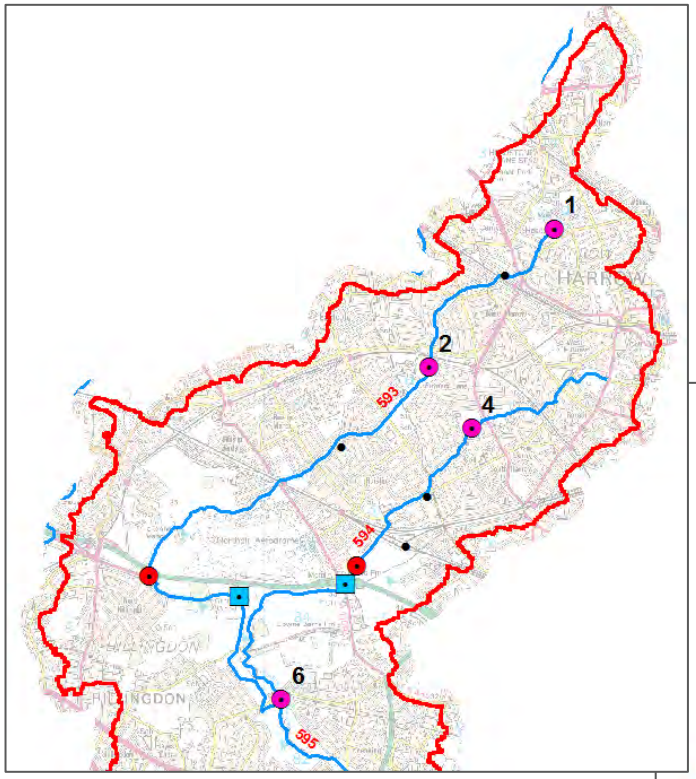
Source Apportionment GIS

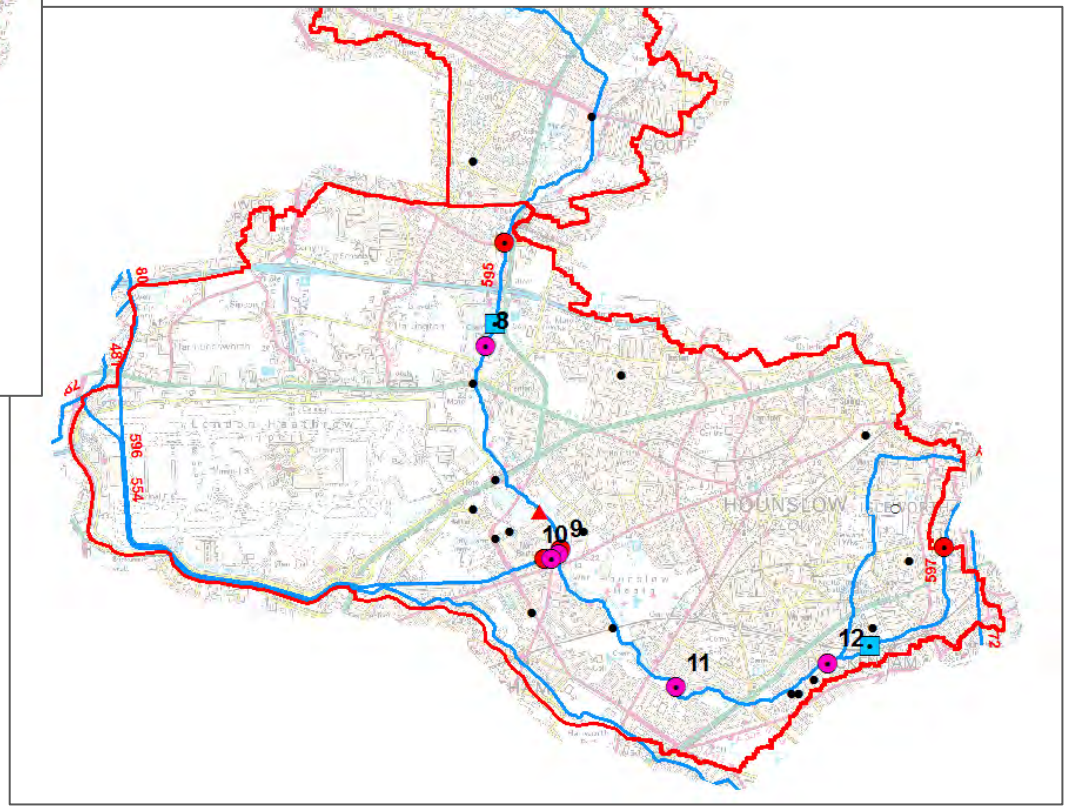
Tom Rolls
River Basin Management Services - Water Quality

14 October 2015

Environment Agency

Source apportionment GIS River Crane structure





Legend

SIMCAT SAGIS features

- # Industry discharge
- ! EA monitoring station
- / River flow gauge
- # Sewage discharge
- ! Intermittent
- Cycle 2 WFD river WB
- Simcat reaches
- ! CC monitoring station

Data source - Crane 2011-14 bespoke calibration, SAGIS v6a, Export Coefficient db A+B, UKWIR/EA calibration methodology, Simcat 14.8rev2 1460 shots.
TR121015

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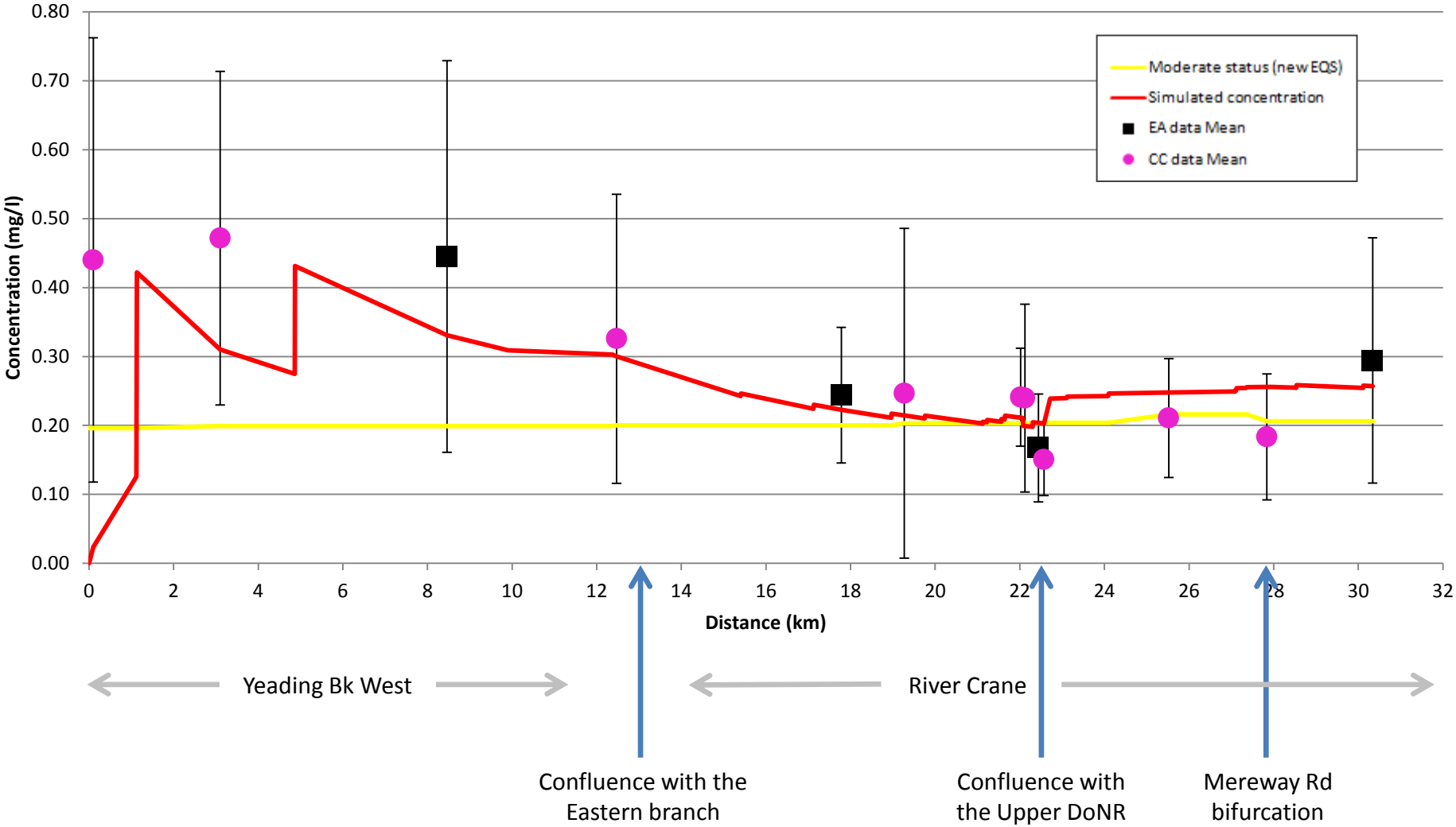
River Crane model forecast



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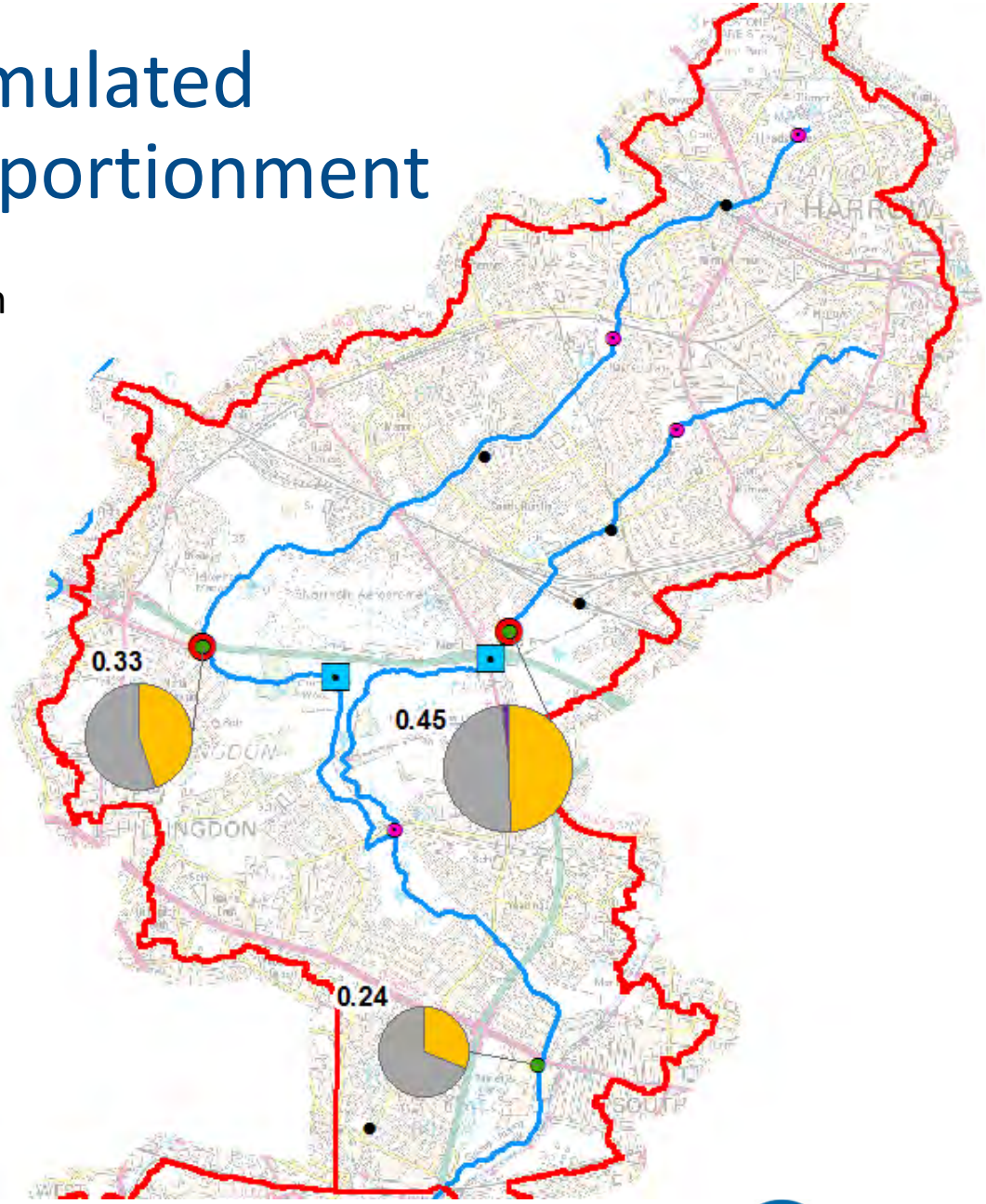
Yeading Brook simulated concentration apportionment

Subject to local QA/verification

Estimated phosphorus source apportionment based on concentration
Size of pie is proportionate to concentration.

$ Source apportionment location

- STW contribution
- Intermittent contribution (should be treated with caution)
- Industry contribution
- Livestock contribution
- Arable contribution
- Highways contribution (trunk only)
- Urban contribution
- Unconnected Pop contribution
- SIMCAT river reaches
- WFD cycle 2 management catchments (DRAFT)



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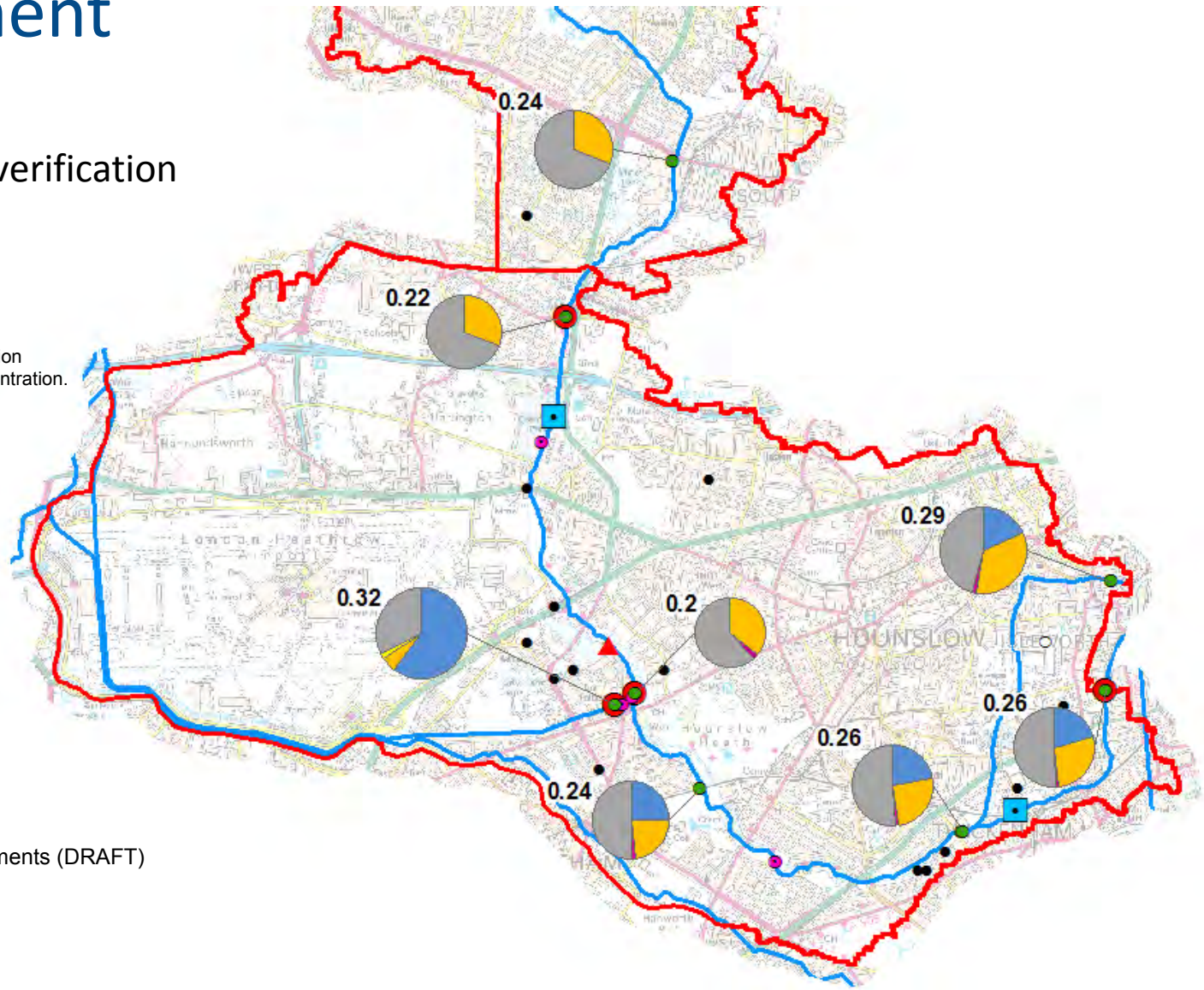

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Environment Agency

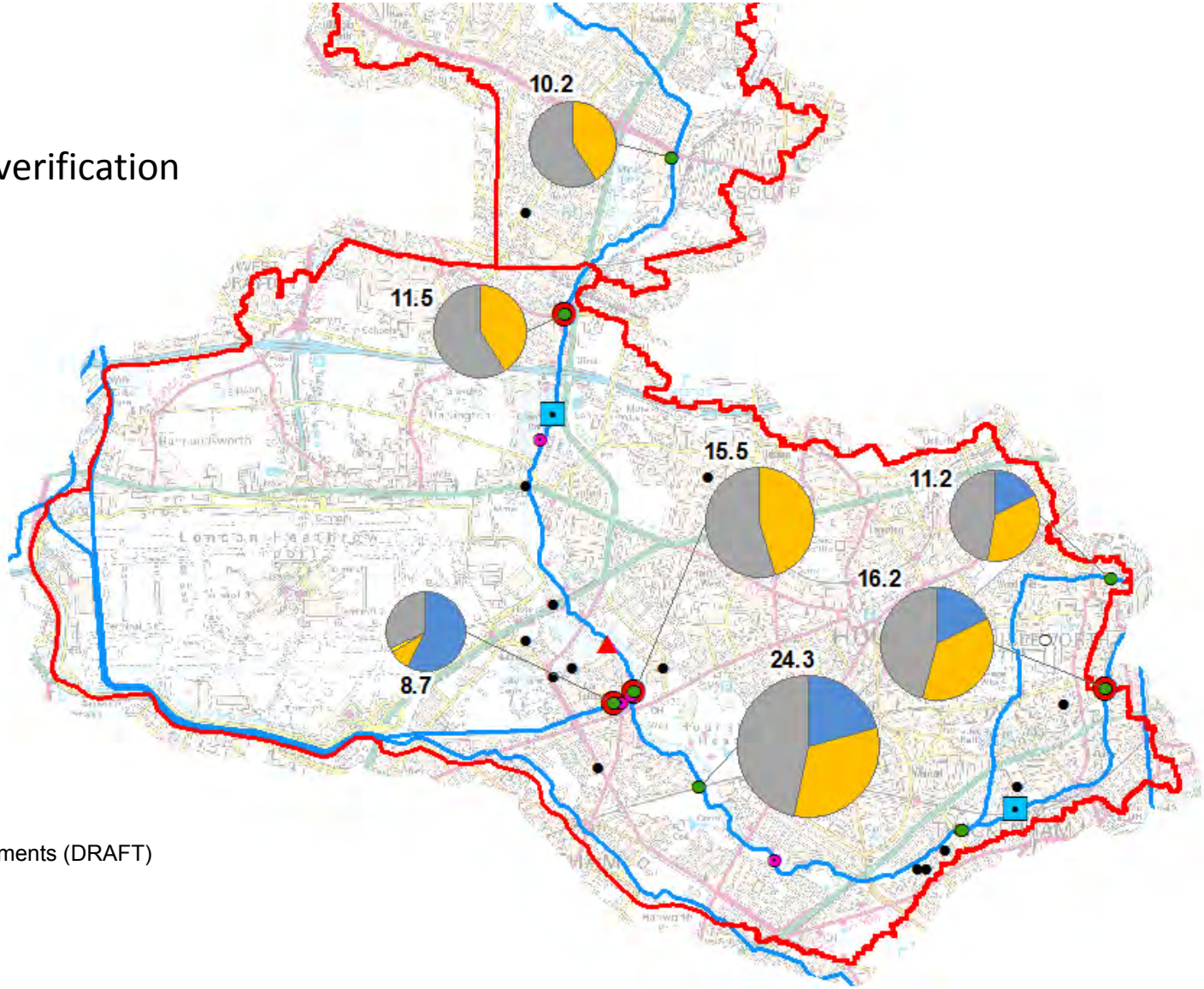
River Crane simulated load apportionment

Subject to local QA/verification

Estimated phosphate source apportionment based on load.
Size of pie is proportionate to load.

$ Source apportionment location

- STW contribution
- Intermittent contribution (should be treated with caution)
- Industry contribution
- Livestock contribution
- Arable contribution
- Highways contribution (trunk only)
- Urban contribution
- Unconnected Pop contribution
- SIMCAT river reaches
- WFD cycle 2 management catchments (DRAFT)



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Catchment source apportionment

Location	River Crane	Estimated concentration source apportionment				Estimated load source apportionment			
		Concentration (mg/l)	STW	Intermittent	Urban diffuse	Cumulative load (Kg/day)	STW	Intermittent	Urban diffuse
@ WQ sample point PCRR0067	Yeading Brook Western branch	0.33	0%	45%	55%	5.2	0%	55%	45%
@ WQ sample point PCRR0063	Yeading Brook Eastern branch	0.45	0%	49%	49%	2.5	0%	63%	37%
Downstream of confluence	River Crane	0.24	0%	31%	68%	10.2	0%	41%	59%
@ WQ sample point PCRR0084	River Crane	0.22	0%	31%	69%	11.5	0%	41%	59%
Upstream of Upper DoNR	River Crane	0.20	0%	36%	61%	15.5	0%	45%	54%
Upper DoNR	Upper DoNR	0.32	60%	5%	32%	8.7	57%	9%	31%
Downstream of confluence	River Crane	0.24	24%	23%	49%	24.3	20%	32%	46%
Upstream of Bifurcation @ WW Rd	River Crane	0.26	22%	25%	50%	26.8	18%	34%	46%
@ WQ sample point PCRR0006	River Crane	0.26	20%	27%	50%	16.2	17%	36%	45%
@ WQ sample point PCRR0025	Lower DoNR	0.29	18%	34%	45%	11.2	17%	35%	46%

Subject to local QA/verification

Data source - Crane 2011-14 bespoke calibration, SAGIS v6a, Export Coefficient db A+B, UKWIR/EA calibration methodology, Simcat 14.8rev2 1460 shots.
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River Crane model uncertainties/next steps

- Flow balance
  - DoNR inputs
  - Bifurcations
- Intermittent operation/locations
- Industrial inputs
  - Correlation
  - Distribution
- Further data collection
- Sensitivity analysis
- Updated SAGIS model 2016
- It's a model

Environment Agency

Citizen Crane
Phosphate (and ammonia)

Rob Gray
Friends of the River Crane Environment (FORCE)

Practicalities

1. 11 sites for 18 months
2. P and NH3 (concentration and loading)
3. 85 per cent return
4. Year one report
5. Site repair day
6. Other issues

Year One Findings

1. Focus on P – WFD
2. A pattern emerged

- Upper arms - high P, (high NH3 and low RMI) – P load of 250 g/hr
- Upper DNR – high P, (low NH3 and low RMI) – P load of 200 g/hr
- Base – P load of 600 g/hr

3. Little seasonal fluctuation in loadings
4. Other issues

Year Two to Date

1. P > 2014
2. NH3 > 2014 – 2 to 5 mg/l in upper reaches
3. Less dilution – but loadings also higher in upper reaches
4. Funding ‘til April 2016 (RMI ‘til April 2019)

Outcomes to Date

1. The CC network
2. Engagement with EA and TW
3. Engagement with the public
4. Linkages with Universities
5. ID and resolve pollution incidents
6. Engaging public and EHOs on misconnections
7. Emerging understanding of underlying chronic problems

What next - beyond April 2016?

1. Full baseline monitoring?
2. Reduce to 4 to 6 per year + more parameters?
3. Field methods for P?
4. Real time monitoring?
5. Focus on key problem areas?
6. Focus on outfall work?
7. Develop University links?
8. Link with other UK projects?
9. Reach characterisation and remediation works?

Empowerment of CC teams + cost effective catchment benefits are key

Thank You

Rob Gray
Friends of the River Crane Environment (FORCE)

@ info@force.org.uk

www.force.org.uk

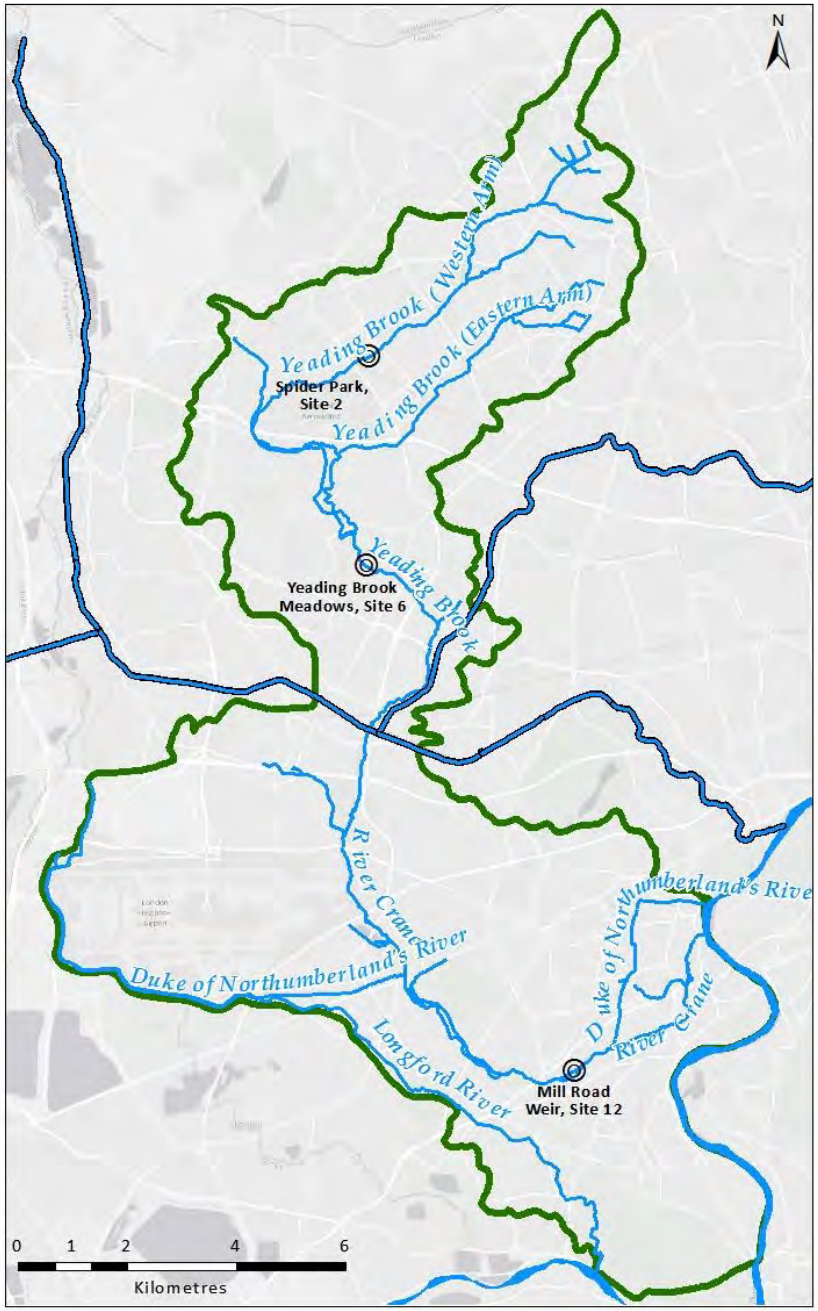
facebook.com/friendsrivercrane

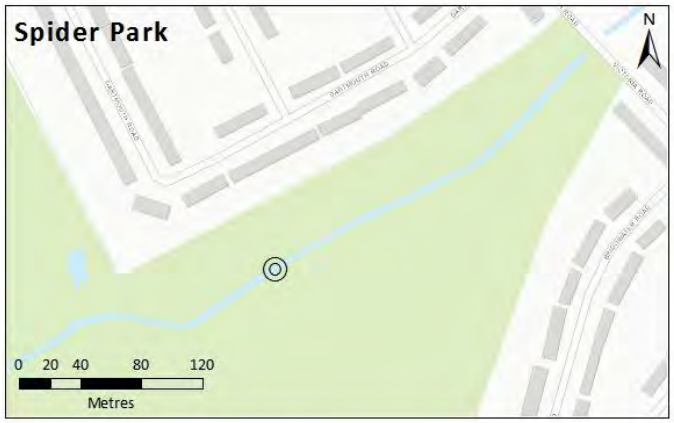
Citizen Crane outfall monitoring feasibility study

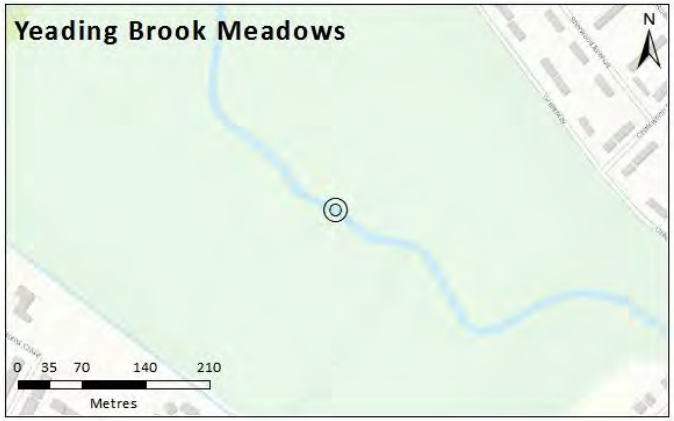
Richard Haine CEnv C.WEM
frog environmental

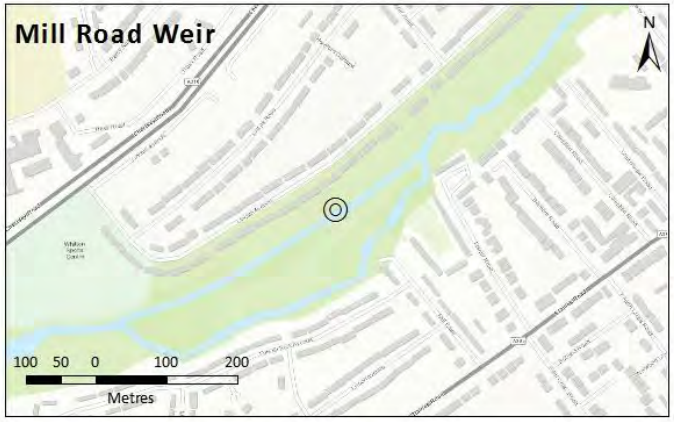
Why are outfalls important?

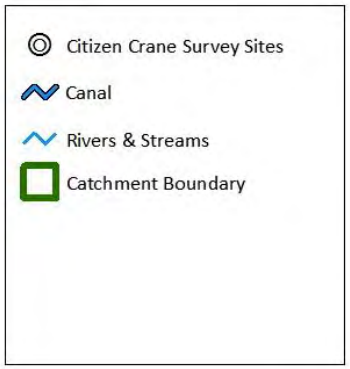
	Crane outfall No.12 05 (April 2015)	Site 12 river crane sample (April 2015)
ammonia (mg/l)	0.18	0.03
phosphate (mg/l)	0.29	0.13











Crane Valley Partnership
HARROW · EALING · HILLINGDON
HOUNSLOW · RICHMOND

Outfall Pilot Project
Map generated by Dr Ilse Steyl, Green Corridor, October 2015
Coordinate System: British National Grid
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Outfall Assessment Sheet

Polluted Surface Water Outfall Pollution Impact Score Sheet

A) Description of PSWO and receiving watercourse

River Crane Yeading Brook East Yeading Brook West *(delete as applicable)*

NGR (if known):					
Location (as detailed as possible)					
Man made/natural bed					
Outfall size *(mm)*:				Rate of flow	No flow
Description *(Box or pipe)*				*(X in the box)*	Trickle
					Low
Outfall type:		Headwater			Moderate
(X in the box)		Within culvert			High
		CSO			
		SWO to river			

B) General visual impact		Score	
	No visible effect	0	
	Localised around outfall or less than 2mtr	2	
	Impact on watercourse of 2 10mtr	4	
	Impact on watercourse of 10 30mtr	6	
	Impact on watercourse greater than 30mtr	10	
		TOTAL	

C) Aesthetics at outfall		Score	
	No odour or visible aesthetics	0	
	Faint smell, only odour, no visible impact	2	
	Grey water, foam or scum	4	
	Strong smell / sewage fungus / litter	6	
	Faeces / gross litter or fungus	10	
		TOTAL	

D) Accessibility / downstream users		Score	
	No public access / single dwelling access	2	
	Minor public access / near to properties	4	
	Public access via footpath or highway	6	
	Recreational area / park / water sports	10	
		TOTAL	

		Total Pollution Impact Score	

Comments:

Weather -

Last Rain -

Assessed by: **Date:**

DRAFT

Headlines

- Total of 22 outfalls monitored monthly
- 5 threshold breaches recorded
- 4 of these breaches confirmed to be in the Thames Water works programme

What have we learnt?

- Limited value in regular monitoring the same outfall on a monthly basis
- The pilot project format doesn’t scale well in its current format
- Able to match ‘our’ polluting outfalls with Thames Water works programme

Where next?

- Whole catchment dry weather flow (DWF) survey for polluting outfalls
- Investigating better, easier, data collection techniques

takeaway points

- Citizen scientists have an important role to play in recognising and reporting pollution events and polluting outfalls

- Catchment wide DWF surveys and development of data collection

- Working collaboratively with all stakeholders is likely to bring about the best results for the river

frog environmental

Thank you!

Acknowledgments

Paul Busby, site 2, Spider Park
Kevin Gates, site 6, Yeading Brook Meadows
Rob Gray, site 12, Mill Road

ZSL
LET'S WORK FOR WILDLIFE

2015 Citizen Crane Forum

RMI update

Joe Pecorelli
Zoological Society of London
joe.pecorelli @zsl.org

RMI 2015


Spider Park

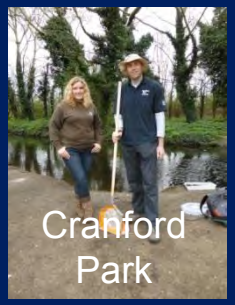

Headstone Manor
Yeading Brook (Western Arm)
Yeading Brook (Eastern Arm)
Ickenham Marsh
Spider Park
Newton Park We
Yeading Brook Meadows
Yeading Brook
Minet Country Park
Cranford Country Park
River Crane
Donkey Wood (DNR)
Donkey Wood (River Crane)
Duke of Northumberland's River
Crane Park Island
Mill Road Weir
Longford River
Northwood
Ruislip
Uxbridge
Hillingdon
Northolt
Hayes
Hounslow
Richmond
Hampton
Stanwell
Twickenham
Hanwell
Brentford
Ickenham
Cowley
Yiewsley
West Drayton
London Heathrow Airport
Stanmore
Harrow Weald
Pinner
Harrow
0 1 2


Headstone Manor


Ickenham Marshes


Newton Park


Minet Country Park


Cranford Park


Y B Meadows

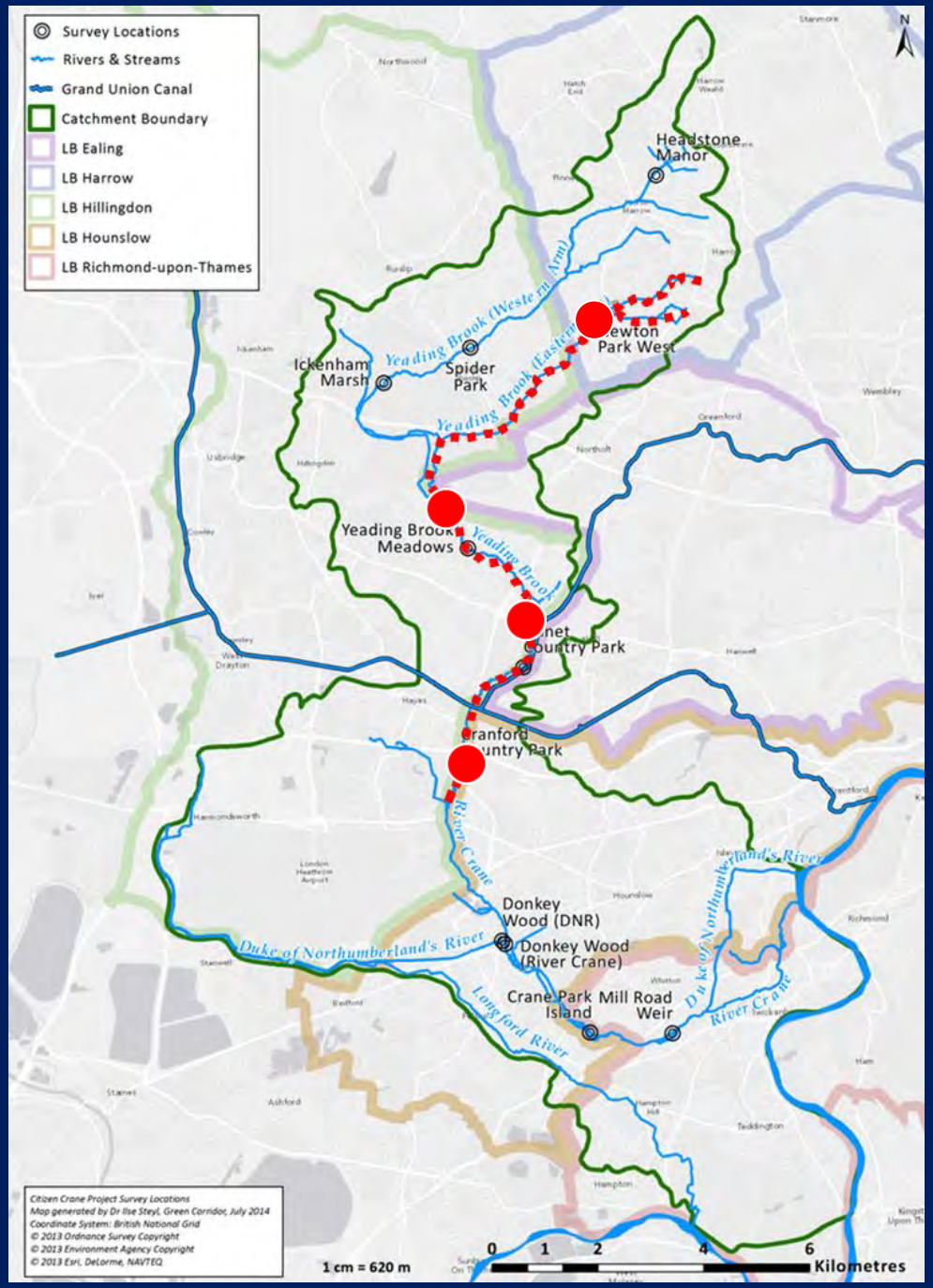

Donkey Wood


Brazil Mill


Crane Park Island

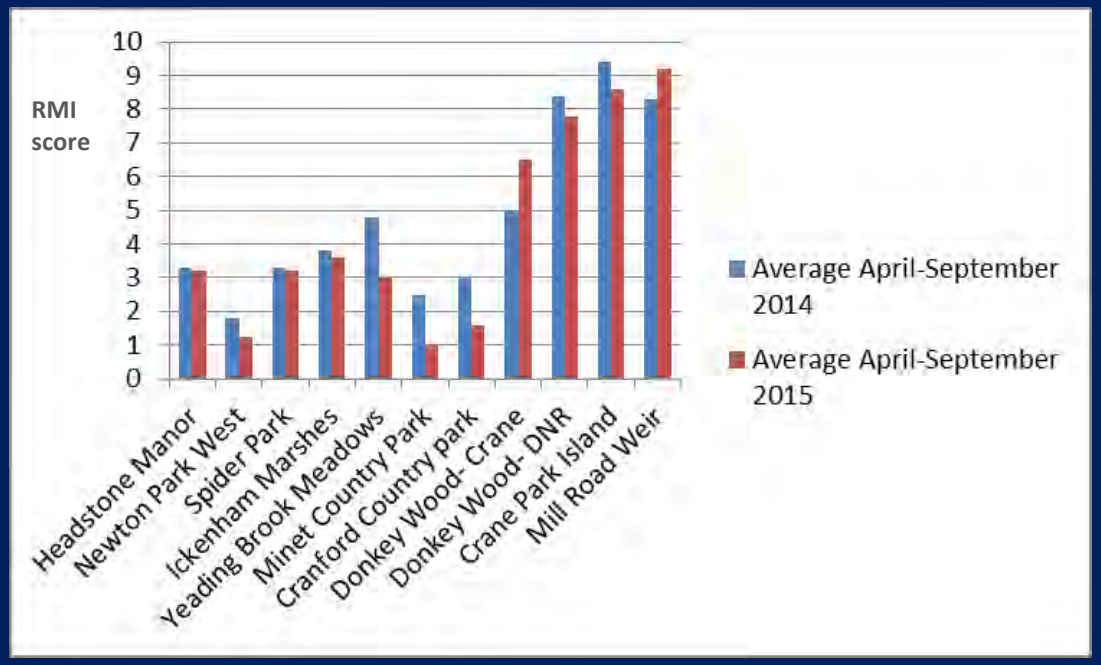

Mill Rd

Number of Trigger Level Breaches



Site	Number of trigger breaches	Number of samples taken	Average score for 2015
Headstone Manor	0	9	3.2
Newton Park West	7	7	1.2
Spider Park	0	9	3.3
Ickenham Marshes	0	6	3.6
Yeading Brook Meadows	7	9	2.9
Minet Country Park	9	9	1.1
Cranford Country park	5	7	2.0
Donkey Wood-Crane	0	9	6.1
Donkey Wood-DNR	4	9	7.4
Brazil Mill	0	3	9.0
Crane Park Island	1	8	8.3
Mill Road Weir	1	9	9.0

Comparing 2014 to 2015



Rank	Site	Percentage change from 2014
1	**Minet Country Park**	-60%
2	**Newton Park West**	-44%
3	**Yeading Brook Meadows**	-37%
4	**Cranford Country park**	-22%
5	Donkey Wood-DNR	-7%
6	Ickenham Marshes	-6%
7	Crane Park Island	-6%
8	Spider Park	-3%
9	Headstone Manor	-3%
10	Mill Road Weir	+11%
11	Donkey Wood-Crane	+30%

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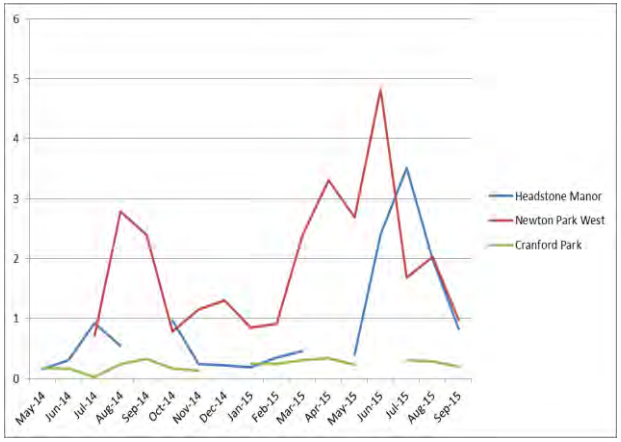
Ammoniacal Nitrogen (mg/l)



RMI score is a general guide to river health

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- We need to prioritise water quality improvements but not forget that habitat can also be improved and that money is available to support this via the CVP/TW fund
- Next RMI Training 17th October
- Wash hands and don't go in if the river is high
- Continuation funding from the City Bridge Trust
- New sites and new volunteers always needed.

Change takes time but you are making it happen..

With great thanks to the project funders and the support and commitment of everyone involved.

Thames Water

Crane Valley Partnership

HARROW · HILLINGDON · EALING · HOUNSLOW · RICHMOND

ZSL

LET'S WORK FOR WILDLIFE

Crane Valley Partnership Citizen Crane Web Application Draft Design

Citizen Crane Forum

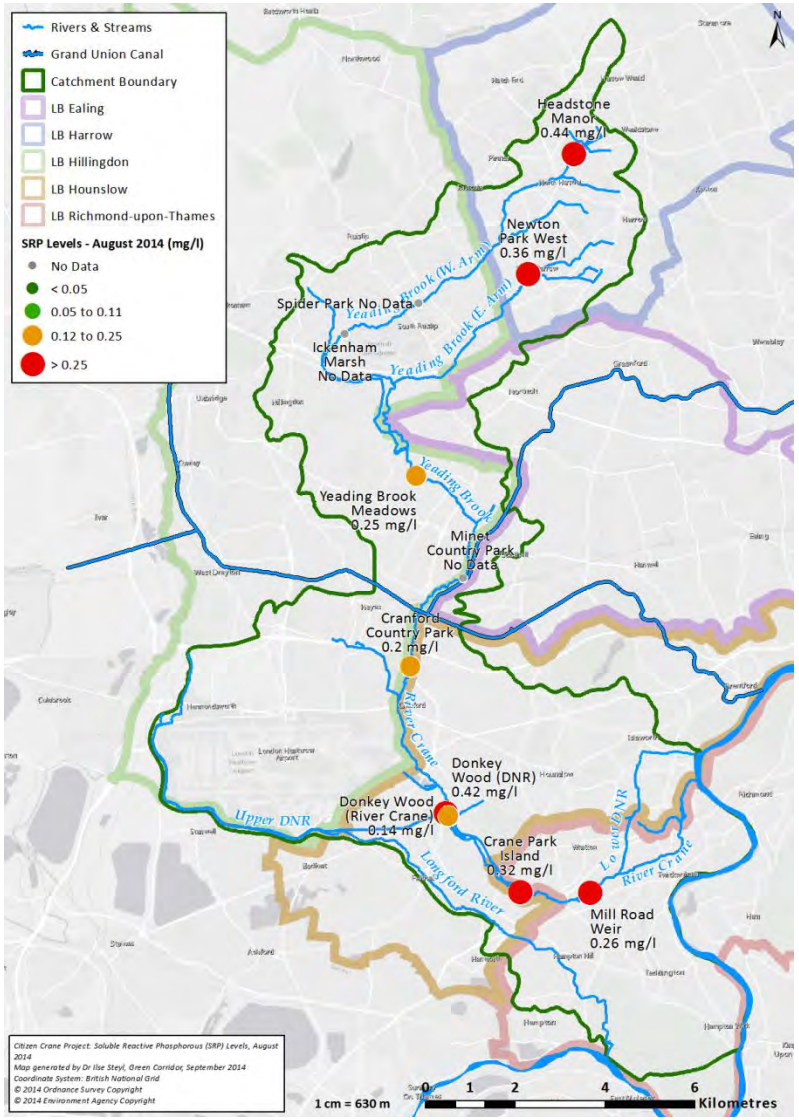
14 October 2015

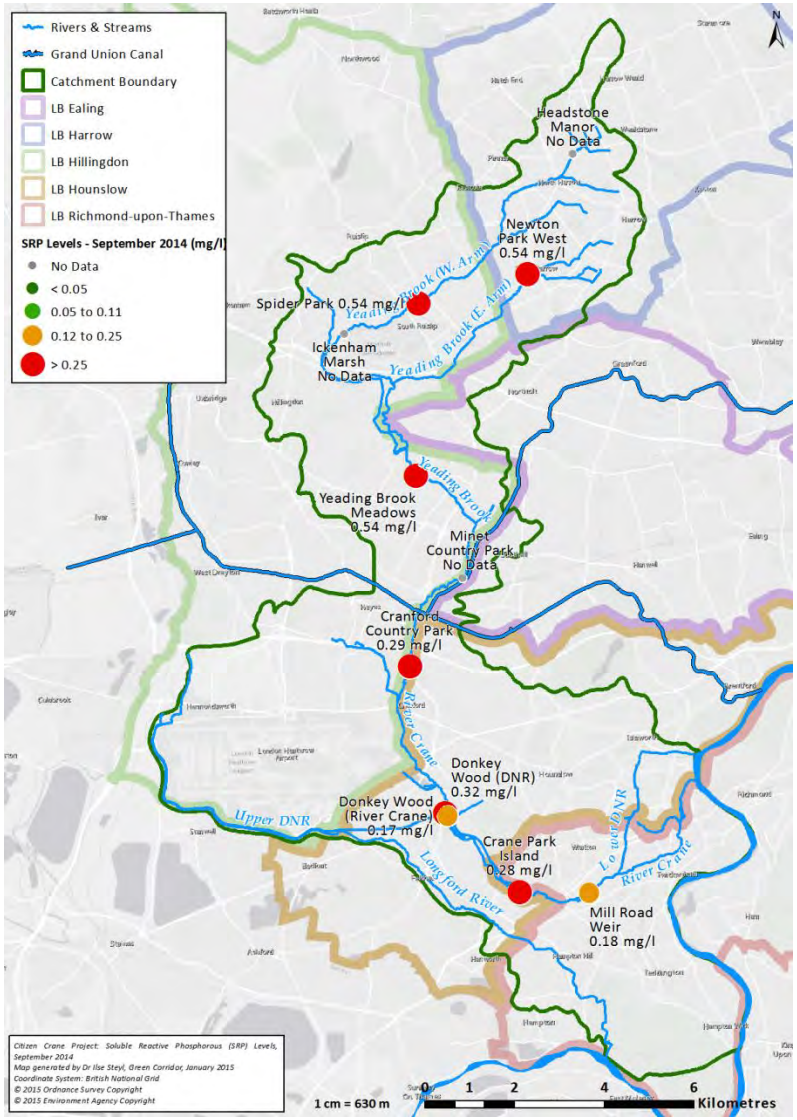
Dr Ilse Steyl

CVP Development Manager

ilse@greencorridor.org.uk

Static Maps

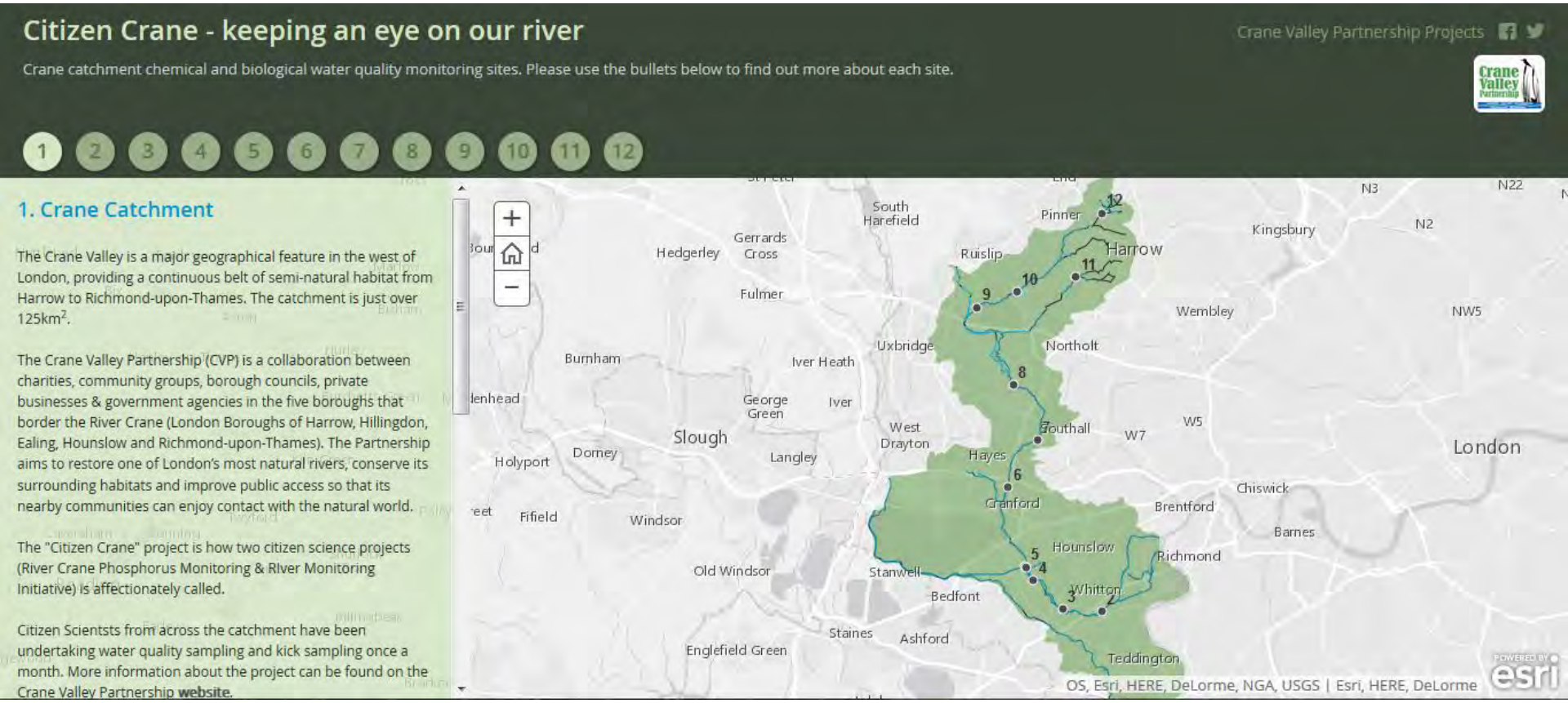

Rivers & Streams
Grand Union Canal
Catchment Boundary
LB Ealing
LB Harrow
LB Hillingdon
LB Hounslow
LB Richmond-upon-Thames
SRP Levels - August 2014 (mg/l)
No Data
< 0.05
0.05 to 0.11
0.12 to 0.25
> 0.25
Headstone Manor 0.44 mg/l
Newton Park West 0.36 mg/l
Spider Park No Data
Ickenham Marsh No Data
Yeading Brook (W. Arm)
Yeading Brook (E. Arm)
Yeading Brook
Yeading Brook Meadows 0.25 mg/l
Minet Country Park No Data
Cranford Country Park 0.2 mg/l
River Crane
Donkey Wood (DNR) 0.42 mg/l
Donkey Wood (River Crane) 0.14 mg/l
Upper DNR
Lower DNR
Crane Park Island 0.32 mg/l
Longford River
Mill Road Weir 0.26 mg/l
Citizen Crane Project: Soluble Reactive Phosphorous (SRP) Levels, August 2014
Map generated by Dr Ilse Steyl, Green Corridor, September 2014
Coordinate System: British National Grid
© 2014 Ordnance Survey Copyright
© 2014 Environment Agency Copyright
1 cm = 630 m
0 1 2 4 6
Kilometres


Rivers & Streams
Grand Union Canal
Catchment Boundary
LB Ealing
LB Harrow
LB Hillingdon
LB Hounslow
LB Richmond-upon-Thames
SRP Levels - September 2014 (mg/l)
No Data
< 0.05
0.05 to 0.11
0.12 to 0.25
> 0.25
Headstone Manor No Data
Newton Park West 0.54 mg/l
Spider Park 0.54 mg/l
Ickenham Marsh No Data
Yeading Brook (W. Arm)
Yeading Brook (E. Arm)
Yeading Brook
Yeading Brook Meadows 0.54 mg/l
Minet Country Park No Data
Cranford Country Park 0.29 mg/l
River Crane
Donkey Wood (DNR) 0.32 mg/l
Donkey Wood (River Crane) 0.17 mg/l
Upper DNR
Lower DNR
Crane Park Island 0.28 mg/l
Longford River
Mill Road Weir 0.18 mg/l
Citizen Crane Project: Soluble Reactive Phosphorous (SRP) Levels, September 2014
Map generated by Dr Ilse Steyl, Green Corridor, January 2015
Coordinate System: British National Grid
© 2015 Ordnance Survey Copyright
© 2015 Environment Agency Copyright
1 cm = 630 m
0 1 2 4 6
Kilometres

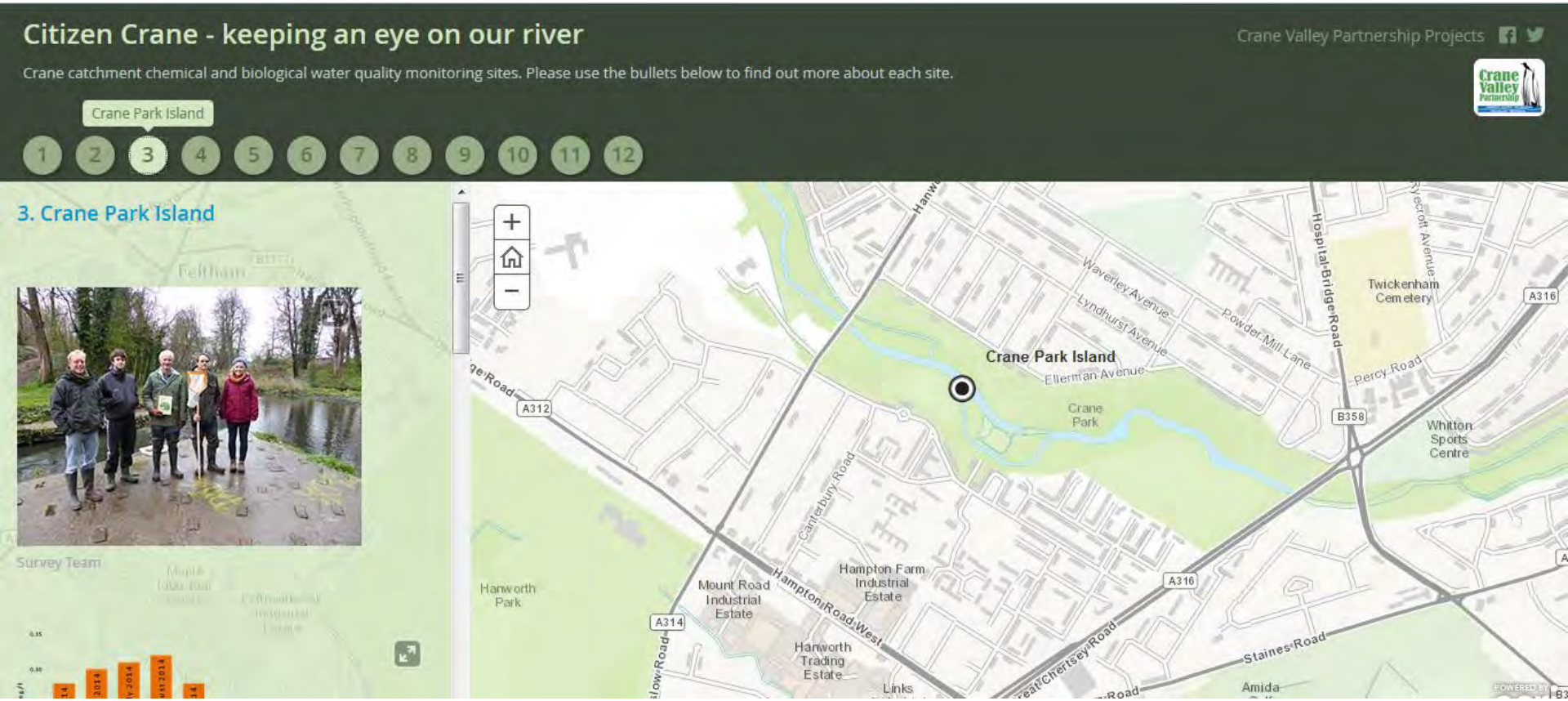
Designing Web Application

- ArcGIS Online - opportunity to design applications to view project data online
- Draft design – needs more content
- Add water quality data (SRP, Ammonia, etc)
- Add RMI scores
- Allow user to navigate maps & data

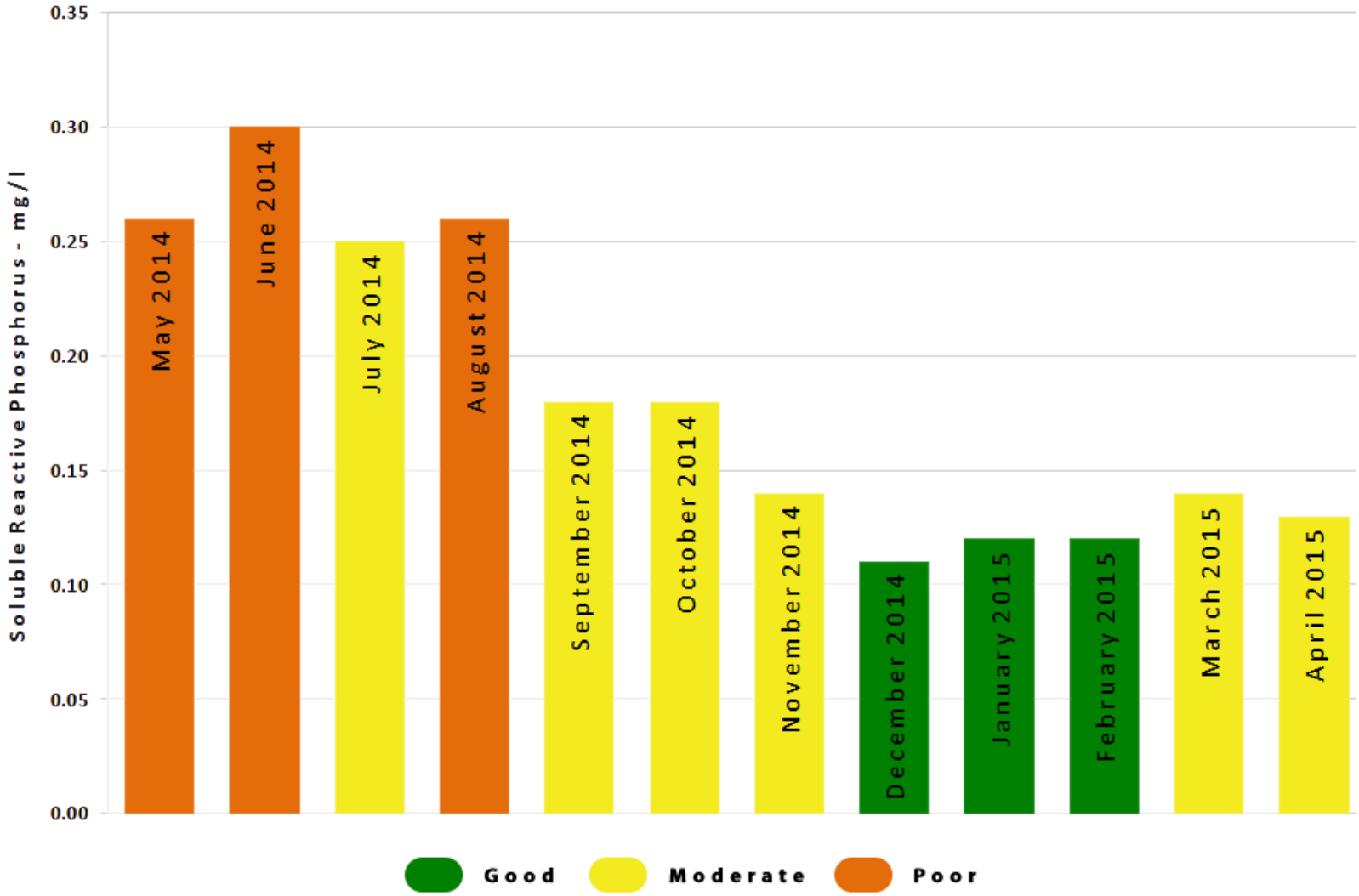
Designing Web Application



Individual Sites – Crane Park Island



Adding charts – Mill Road Weir



Demonstration

- http://arcg.is/1TxxQqY

END