

KEEPING OUR RIVERS FLOWING

SUMMIT HOSTED BY




An aerial photograph showing a significant flood event. A large area of land, including fields and a village, is surrounded by brown, murky floodwater. A road and a railway line run through the center of the village, providing a clear path through the inundated area. The sky is clear and blue, suggesting a bright day.

“Keeping Our Rivers Flowing” The Somerset Experience

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- An aerial photograph showing a wide, straight road or railway track cutting through a vast, flooded landscape. The water is a murky, brownish-grey color, and numerous small, dark, leafless trees and bushes are scattered throughout the flooded areas, some standing in small islands of land. The background shows a flat, green landscape under a hazy sky.
- Since flooding in the summer of 2012 and the winter 13/14 we have achieved many improvements in flood risk in Somerset, only made possible through much needed extra financial support and co operation between partners.



- **Provision of an initial £10m from central government allowed us to get on with the immediate obvious tasks (Including overdue dredging of some Main Rivers)**

- The subsequent formation of the Somerset Rivers Authority has been a successful partnering of public bodies to deliver many additional flood risk improvements across the county funded through local taxation and other new funding sources (Such as LEP)



- **However, this work was reactive “After the event” and after many years where it had been argued by EA the work would not deliver worth while benefits.**
- **We know much remains to be done to restore and then maintain the conveyance of Somerset’s other Main Rivers.**

In the absence of any recent critical imperative (i.e. Major Flooding) we must ensure that future work does not become

- Over-Regulated**
- Under-Funded**
- Perfunctory**

Conveyance and storage in the Levels and Moors is important !

- Flow which exceeds the **conveyance** capacity of the Main Rivers spills over the raised banks into the lowland systems, where it causes flooding

Conveyance and storage in the Levels and Moors is important !!

- Here it is **stored** until river levels subside and it can be drained or pumped back into the high level carriers

Conveyance and storage in the Levels and Moors is important !!

- Better conveyance delays the onset, and duration of exceedance conditions in the embanked Main Rivers and hastens the return to lower river levels, allowing evacuation of floodwater from the lowland systems to recommence

Conveyance and storage in the Levels and Moors is important !!

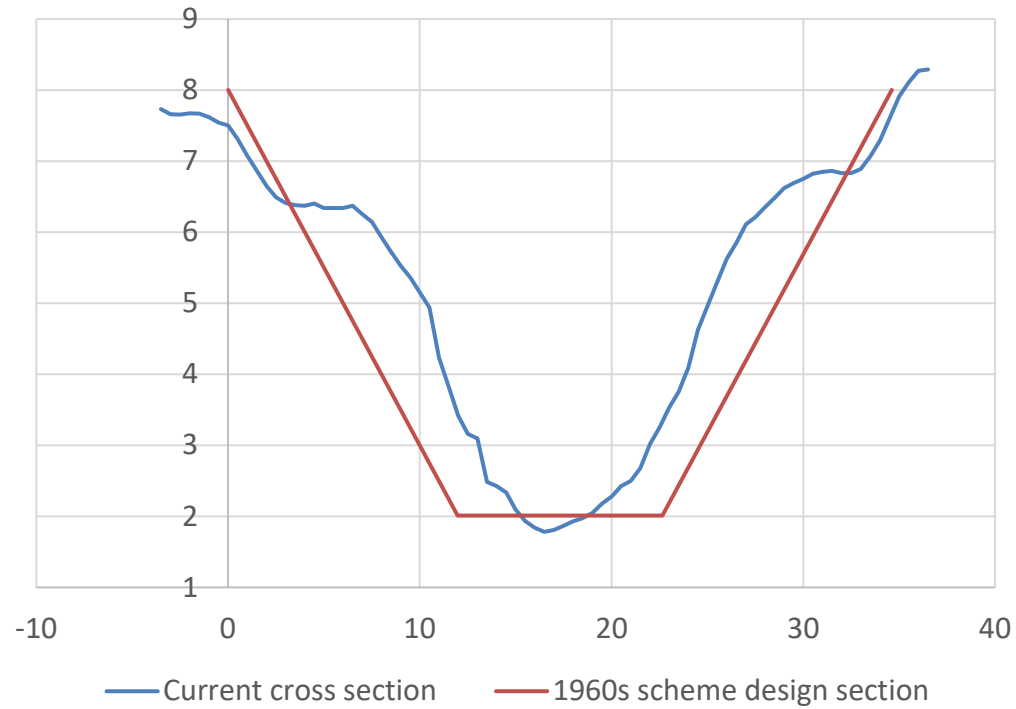
- This in turn reduces the extent, depth and duration and frequency of flooding
- Just 1m³/s of flow kept in bank for 1 day in bank full conditions equates to over 86,000m³ of flooding avoided

The Somerset Experience

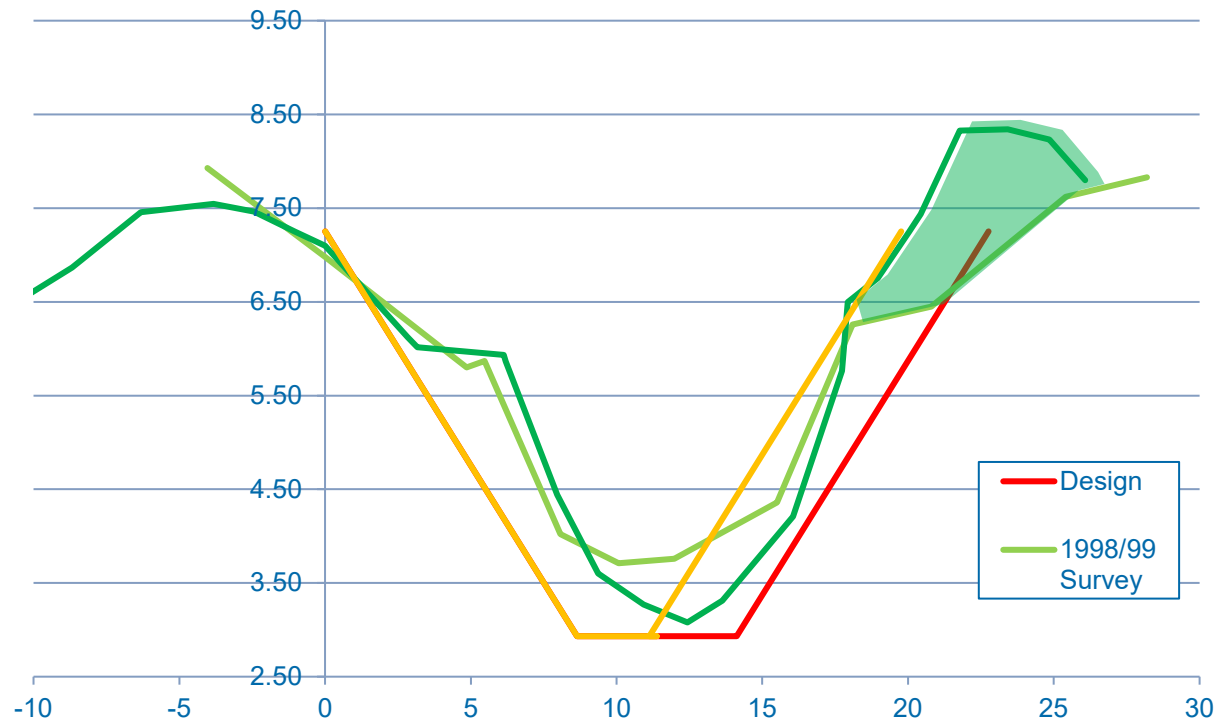
Summer Flooding 2012

- Heavy summer rainfall events
- **Exceedance of channel capacity**
- Widespread (5000 ha) long duration flooding in warm conditions leading to rotting vegetation and loss of crop
- Agricultural damages (£2m)
- Widespread environmental damage in designated sites
- **The direct result of reduced conveyance ?**

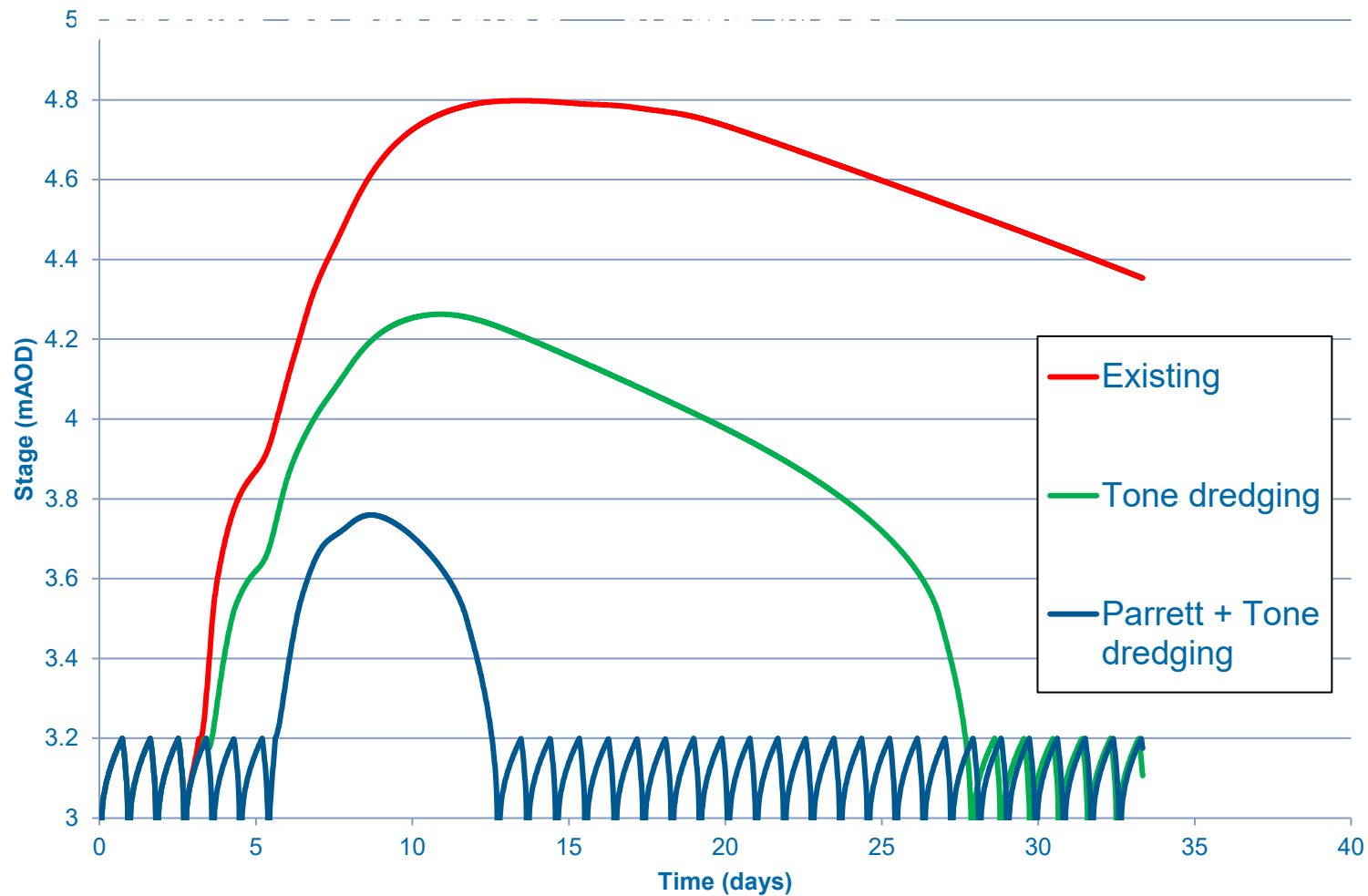
Parrett Cross Section 2012.



Tone Cross Section 2012



Flood levels in North Moor Main Drain – 2012 Floods




Hardening of the debate about Reduced Conveyance = increased flooding from Main River.

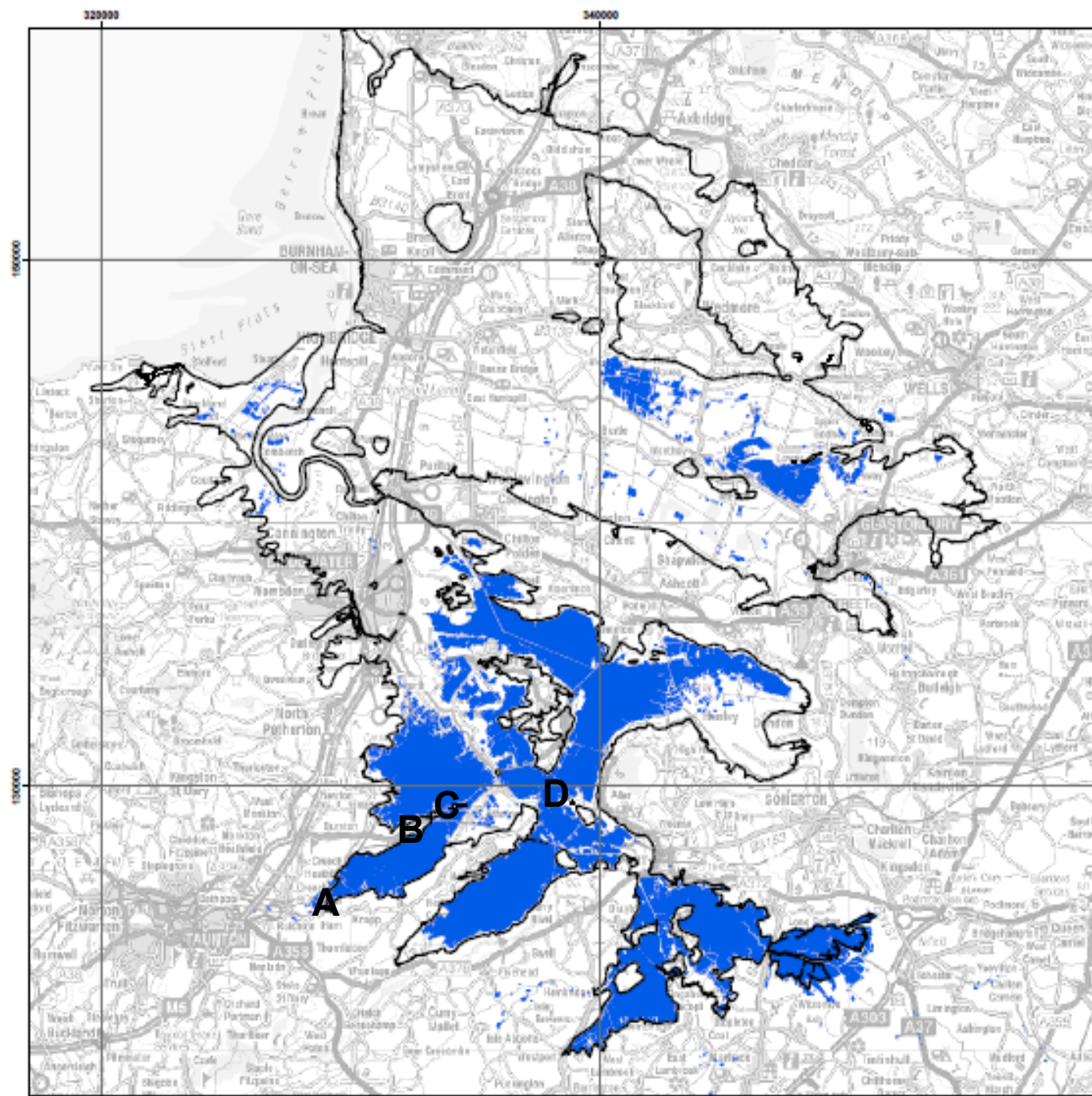
- EA position “insufficient benefit to justify work, Environmental Sensitivities and Regulation will not allow restoration of the channel”
- “Higher priority work to do” “Too difficult”
- Limited concession to removing the worst localised “Pinch Points” through revenue funding

Followed By Winter Flooding

2013/14



- Wettest winter for 250 years
- EA incident room open 24/7 from 20th December 2013 until 14 March 2014.
- 2 Severe flood warnings issued on the Levels and Moors.
- 165 properties suffered internal flood damage across the Somerset Levels and Moors for up to 3 months.
- Communities totally cut off for weeks. 'A' roads closed for 6-8 weeks. **Railway lines flooded.**
- Major incident declared in early February. Gold and Silver commands set up.

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- An aerial photograph showing a vast, flat landscape completely inundated with brown, murky floodwater. A long, straight dike or embankment runs diagonally from the bottom left towards the center of the frame. Along this dike, several large, bright yellow and red industrial pumps are visible, likely used for draining the surrounding area. The background shows distant, hazy hills under a clear blue sky. The foreground and middle ground are dominated by the floodwater, with some small patches of land and trees visible above the surface.
- 100 million cubic metres of water stored on the moors.
 - On many of the moors the water levels were the highest ever recorded.
 - Also coincided with very high astronomical tides.
 - EA had over 100 permanent and temporary pumps available including 20 from Holland. At the peak they were pumping 8 million cubic metres of water a day.
 - **TOTAL DAMAGES Single event £118 million !**



Flooding Somerset Levels 19th February 2014

Legend

-  Estimated Water Extent
-  Somerset Levels & Moors Boundary provided by FCRM - Wessex

0 2.5 5 10
Kilometres

Projection: Ordnance Survey 1936

Estimated flood extent on 19/02/2014

Area approx. 10,400 ha

The flood extent was estimated from
TerraSAR-X satellite data acquired at
19/02/2014 18:01 UTC.

These data were used to map the water
extent within the flooded analysis area.



Map generated by Environment Agency,
National Operations, Geomatics.

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Ordnance Survey 100024198.

Derivative Works product

National Profile led to action by EA.

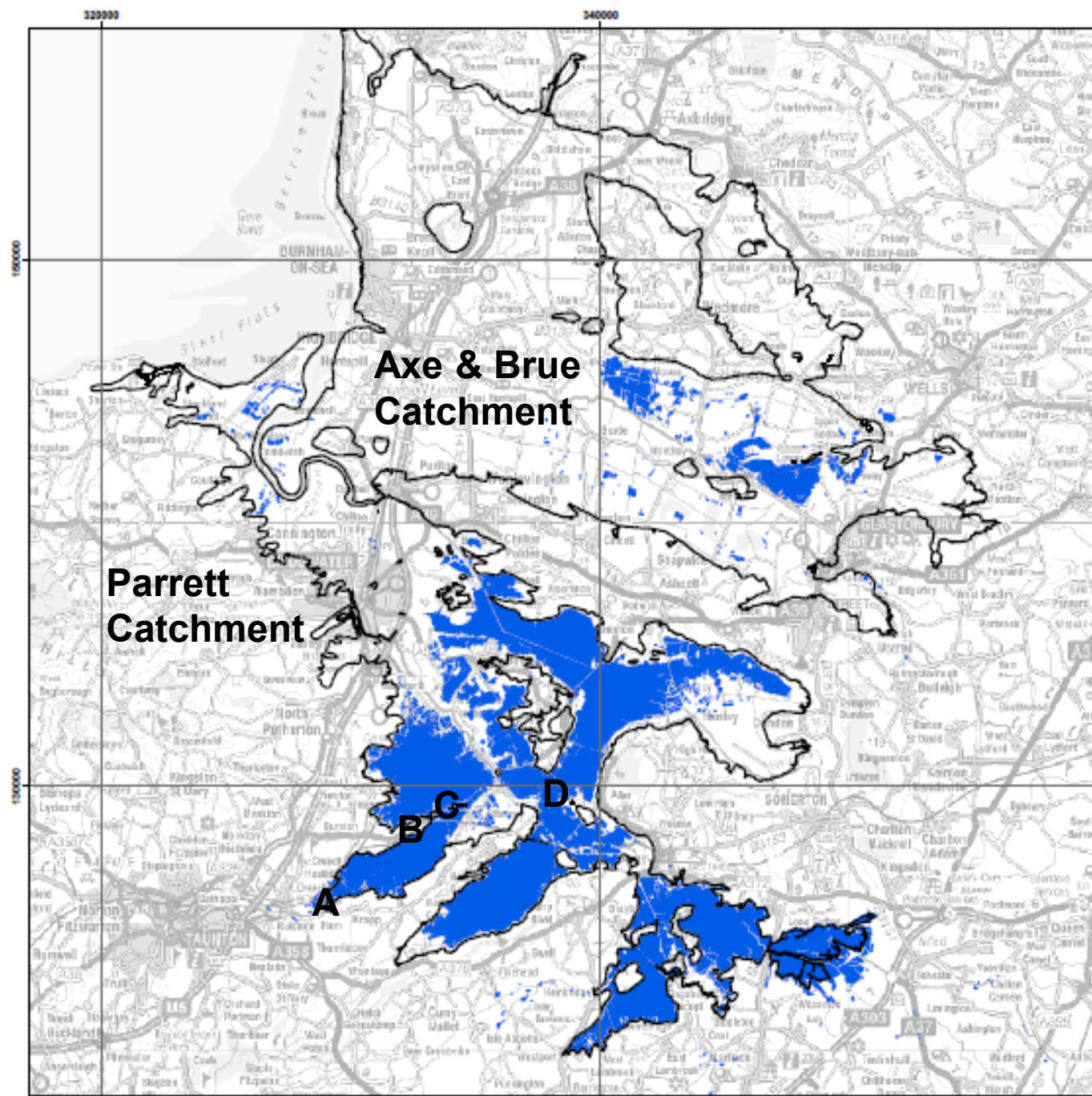


Dredging Success (Conveyance)

- Delivered by EA
- Most beneficial length of Parrett and Tone (8km)
- 130,000 cubic metres of silt in 7 months
- Traditional methods
- Difficult, expensive, but successful in delivering an improved channel and substantially reduced flood risk
- **As a result, in an equivalent future flood event, no houses in Moorland would flood**
- **Why did this work only happen after the event ?**



Less EA appetite post Dredging

- EA withdrew from maintenance of newly dredged channel
- EA now act as Regulator not deliverer
- National Funding unavailable
- Future work financed locally through newly formed Somerset Rivers Authority.
- IDB stepped in as delivery body (PSCA) for maintenance and new conveyance work on Parrett and Tone.
- **IDB unsuccessful promoting conveyance work on other Main Rivers eg RIVER BRUE**
- EA business as usual



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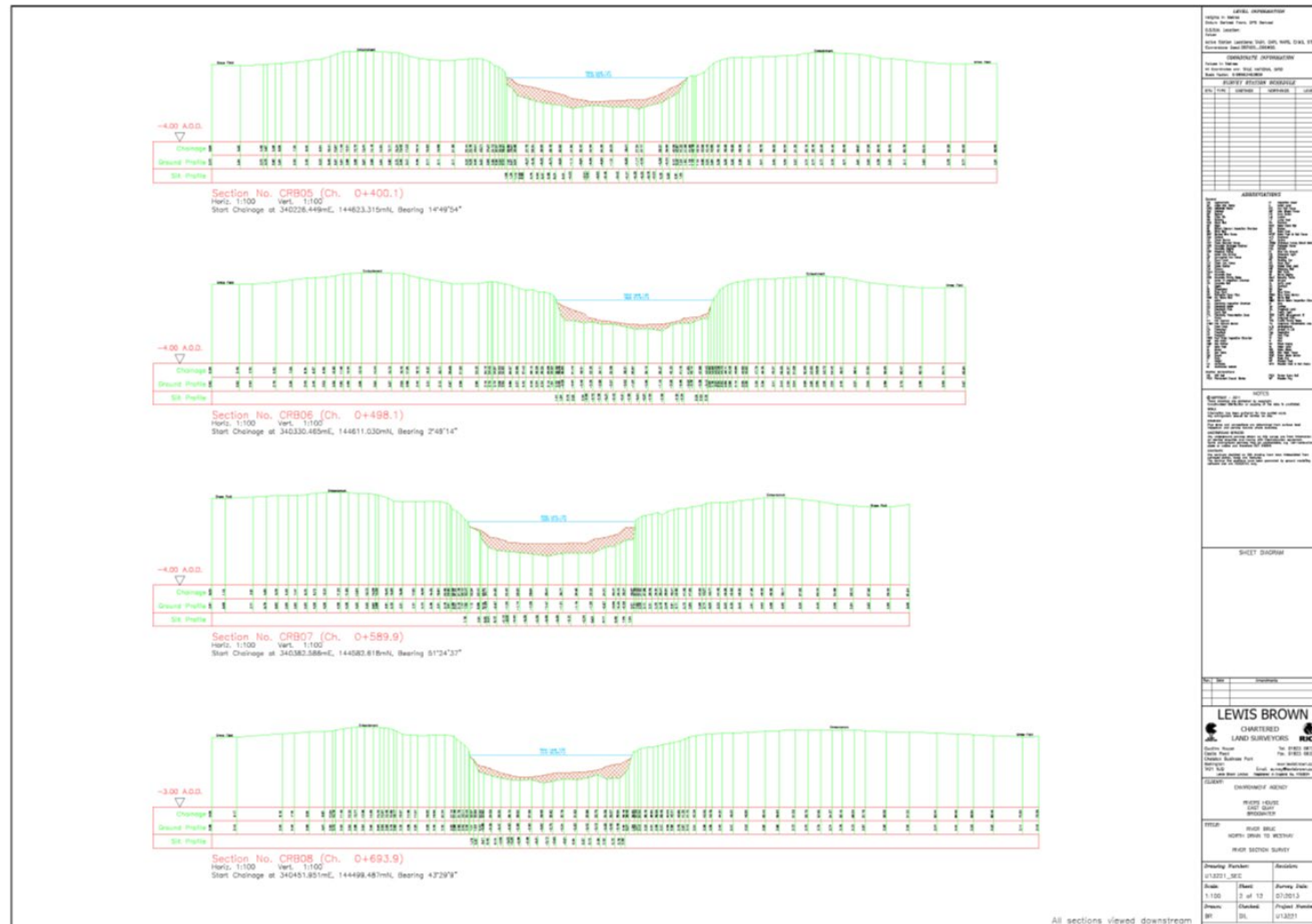


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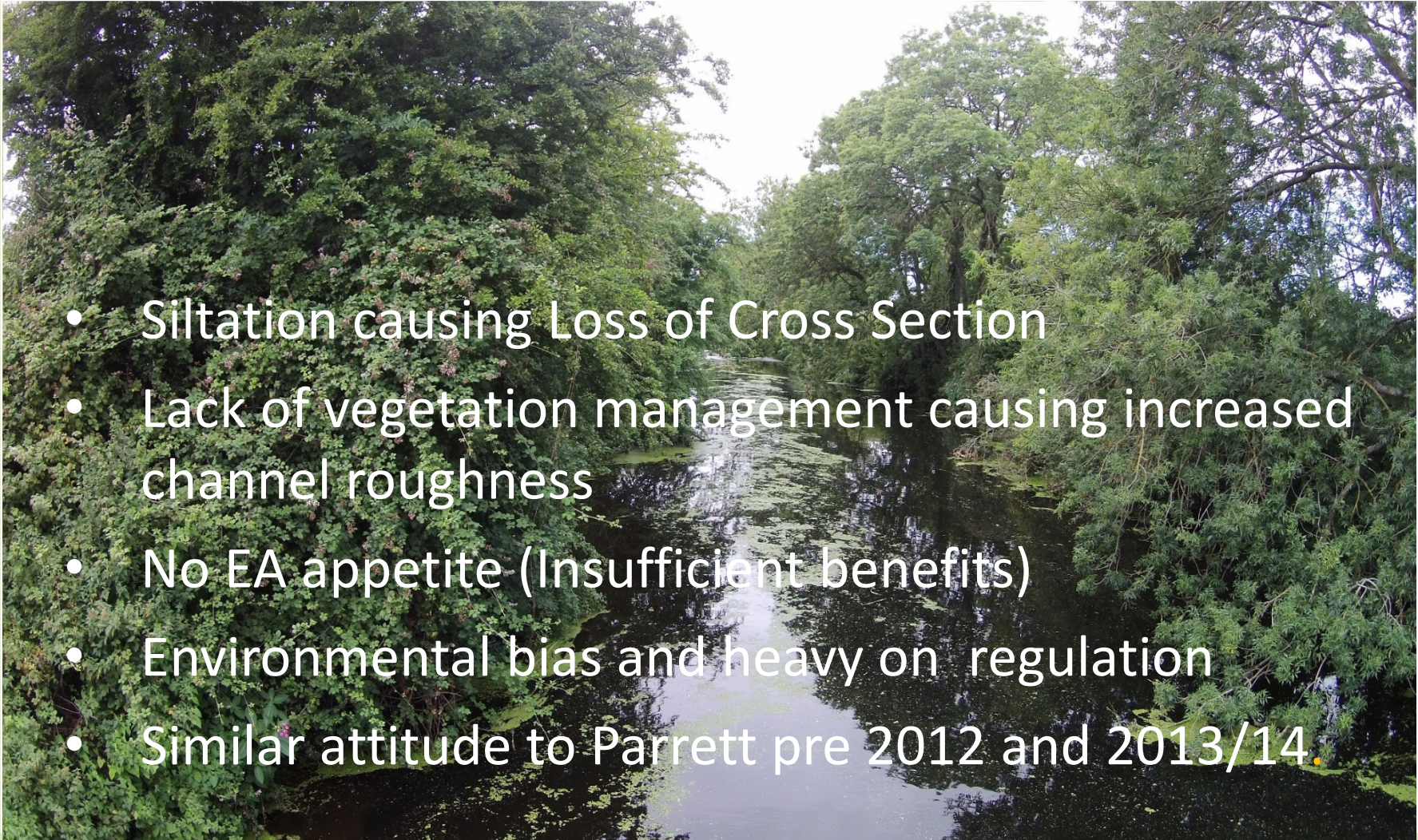
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Derivative Works product

Catastrophe waiting to happen ?



River Brue Main River, Another Catastrophe waiting to happen ?

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- Siltation causing Loss of Cross Section
 - Lack of vegetation management causing increased channel roughness
 - No EA appetite (Insufficient benefits)
 - Environmental bias and heavy on regulation
 - Similar attitude to Parrett pre 2012 and 2013/14.

Estimated Benefit of Reduced Flood Risk in the Brue Valley ?



Rhetorical Question to stimulate discussion.

Will we have to wait for major flood events in the Brue and similar catchments to stimulate proper partnering and action to restore and maintain conveyance of Main Rivers in IDB areas ?

END AND DISCUSSION