



National Audit Office



REPORT

# Resilience to flooding

Department for Environment, Food & Rural Affairs

---

SESSION 2023-24  
15 NOVEMBER 2023  
HC 189



We are the UK's independent public spending watchdog.

We support Parliament in holding government to account and we help improve public services through our high-quality audits.

The National Audit Office (NAO) scrutinises public spending for Parliament and is independent of government and the civil service. We help Parliament hold government to account and we use our insights to help people who manage and govern public bodies improve public services.

The Comptroller and Auditor General (C&AG), Gareth Davies, is an Officer of the House of Commons and leads the NAO. We audit the financial accounts of departments and other public bodies. We also examine and report on the value for money of how public money has been spent.

In 2022, the NAO's work led to a positive financial impact through reduced costs, improved service delivery, or other benefits to citizens, of £572 million.

# Resilience to flooding

Department for Environment, Food & Rural Affairs

---

## Report by the Comptroller and Auditor General

Ordered by the House of Commons  
to be printed on 13 November 2023

This report has been prepared under Section 6 of the  
National Audit Act 1983 for presentation to the House of  
Commons in accordance with Section 9 of the Act

---

**Gareth Davies**  
**Comptroller and Auditor General**  
**National Audit Office**

**9 November 2023**

## Value for money reports

**Our value for money reports examine government expenditure in order to form a judgement on whether value for money has been achieved. We also make recommendations to public bodies on how to improve public services.**

The material featured in this document is subject to National Audit Office (NAO) copyright. The material may be copied or reproduced for non-commercial purposes only, namely reproduction for research, private study or for limited internal circulation within an organisation for the purpose of review.

Copying for non-commercial purposes is subject to the material being accompanied by a sufficient acknowledgement, reproduced accurately, and not being used in a misleading context. To reproduce NAO copyright material for any other use, you must contact [copyright@nao.org.uk](mailto:copyright@nao.org.uk). Please tell us who you are, the organisation you represent (if any) and how and why you wish to use our material. Please include your full contact details: name, address, telephone number and email.

Please note that the material featured in this document may not be reproduced for commercial gain without the NAO's express and direct permission and that the NAO reserves its right to pursue copyright infringement proceedings against individuals or companies who reproduce material for commercial gain without our permission.

Links to external websites were valid at the time of publication of this report. The National Audit Office is not responsible for the future validity of the links.



# Contents

**Key facts** 4

**Summary** 5

**Part One**

Governance, understanding and management of flood risk 19

**Part Two**

Progress on the capital programme 26

**Part Three**

Maintaining flood defence assets 44

**Appendix One**

Our audit approach 50

This report can be found on the National Audit Office website at [www.nao.org.uk](http://www.nao.org.uk)


If you need a version of this report in an alternative format for accessibility reasons, or any of the figures in a different format, contact the NAO at [enquiries@nao.org.uk](mailto:enquiries@nao.org.uk)


The National Audit Office study team consisted of:

Marc Adams, Richard Davis, Alex Farnsworth, Sarah Hipkiss, Ronan Smyth and Dan Varey, under the direction of Keith Davis.

For further information about the National Audit Office please contact:

National Audit Office  
Press Office  
157-197 Buckingham Palace Road  
Victoria  
London  
SW1W 9SP

 020 7798 7400

 [www.nao.org.uk](http://www.nao.org.uk)

 @NAOorguk

## Key facts

---

**£5.6bn**

total central government capital funding for the period 2021-2027

---

**200,000**

Environment Agency's latest forecast for the number of properties that will be better protected through the capital programme, around 40% fewer than the government's original commitment of 336,000

---

**203,000**

additional properties at increased risk of flooding due to 93.5% of Environment Agency assets in high consequence systems being at required condition in summer 2023, compared to 98% which the Environment Agency considers optimal value for money

---

**5.7 million**

properties at risk of flooding in England in 2022-23

**£800 million**

of partnership funding that is yet to be secured of the £2.3 billion total partnership funding needed (including for projects that will deliver properties better protected after the current six-year capital programme)

**9%**

proportion of partnership funding provided by private sector (the Environment Agency estimates that businesses incur between 27% and 57% of all costs arising from flood damage)

**96,000**

flood defence assets maintained by the Environment Agency

**£34 million**

Environment Agency's assessment of the shortfall in its maintenance funding for 2022-23: its analysis showed that maintaining 98% of its high consequence assets at required condition at a cost of £235 million would achieve optimal value for money but received £201 million in the 2021 Spending Review

**93.5%**

of the Environment Agency's assets in high consequence systems are being maintained at required condition in summer 2023, below the 98% it regards as optimal

# Summary

## Background

**1** Flooding and coastal erosion put lives, livelihoods and people's well-being at risk. Flooding can affect food production and destroy natural habitats. In February 2022, the country experienced three named storms (Dudley, Eunice and Franklin) in one week for the first time. More than 370 properties were affected, mainly by river flooding. In July 2021, parts of London received a month's rain within a couple of hours. More than 1,500 properties suffered from surface water flooding as a result. More recently, heavy, persistent and widespread rain affected much of England when Storms Babet and Ciaran struck in October and November 2023. The Met Office reported that 18th to 20th October was the third wettest independent three-day period for England and Wales in a series dating back to 1891. The Environment Agency (EA) reported that, by the end of October, Storm Babet alone had caused 2,200 homes to be flooded.

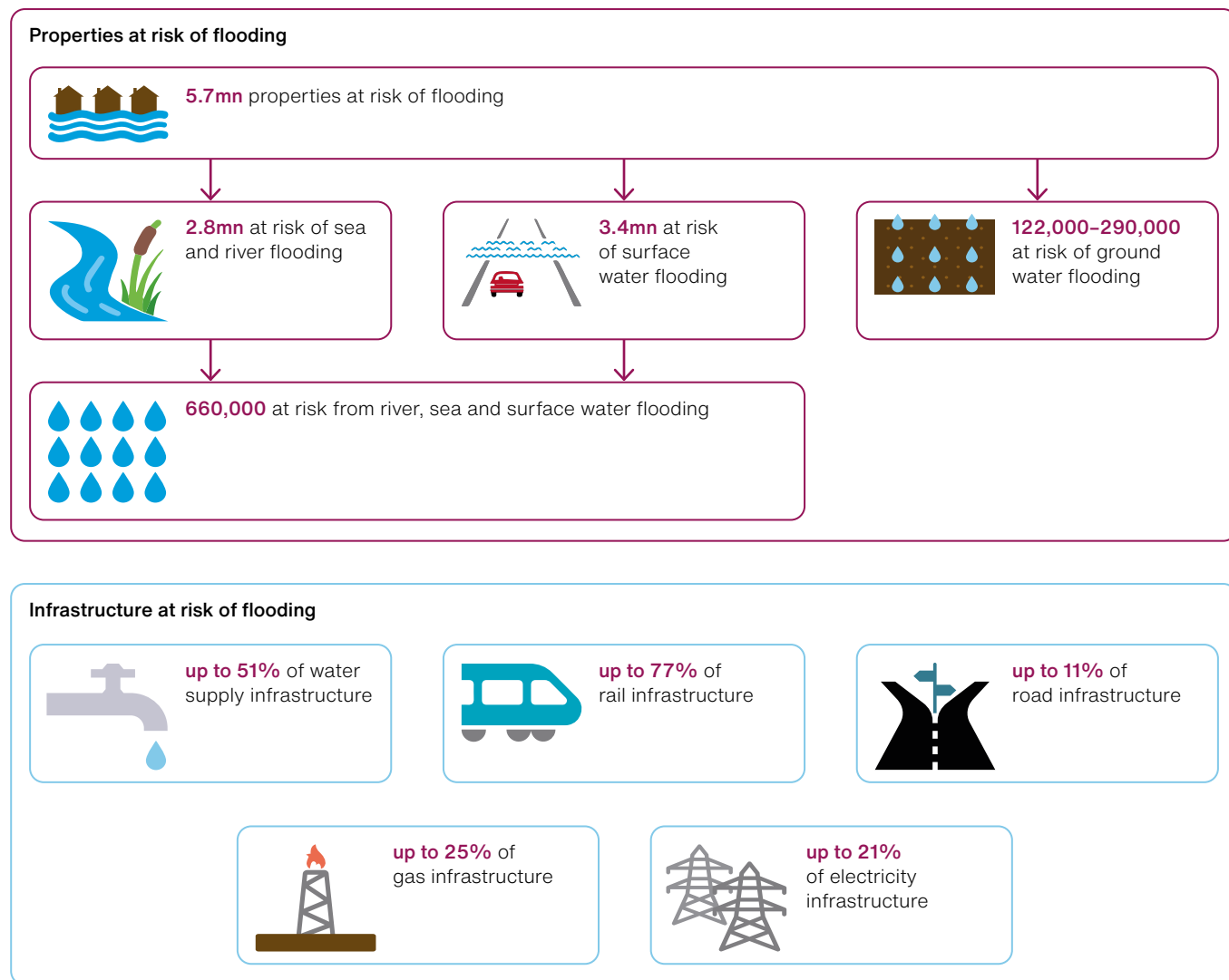
**2** There are four main sources of flood risk: rivers; the sea; surface water (when rainwater cannot drain away); and groundwater (where the water table level rises above ground).

**3** EA estimates that, in 2022-23, approximately 5.7 million properties in England were at risk from flooding. This figure has increased by around 500,000 between 2021-22 and 2022-23. EA reports that this is due to a better understanding of the level of risk, through improved information, rather than an increase in risk. There is also risk to transport and utilities infrastructure from flooding (**Figure 1** overleaf). The Met Office's UK climate projections show UK average temperatures increasing and sea levels rising. Its projections indicate more extreme weather events, including more intense rainfall. This, when combined with other factors such as more housing development, will increase flooding risks if mitigating actions are not taken.

**4** The Department for Environment, Food & Rural Affairs (Defra) is the policy lead for flooding and coastal erosion in England with EA responsible for taking a strategic overview of all sources of flooding and coastal erosion. Risk management authorities (of which EA is one) are responsible for aspects of local and regional flood risk management (**Figure 2** on page 7).

**Figure 1**  
Properties and infrastructure at risk of flooding in England, 2022-23

In 2022-23, approximately 5.7 million properties were at risk of flooding in England



**Notes**

- 1 Some properties identified within the 5.7 million at risk of flooding face multiple risks of flooding and therefore the underlying numbers sum to greater than 5.7 million.
- 2 The figure for ground water flooding is for 2021-22.

Source: National Audit Office analysis of Environment Agency estimates



## Figure 2

### Roles and responsibilities of main bodies involved in flood risk management in England

A range of bodies have national, regional and local responsibilities

#### Department for Environment, Food & Rural Affairs (Defra)

Defra has overall national responsibility for policy on flood and coastal erosion risk management, and provides funding for flood risk management authorities.

#### Regional flood and coastal committees (RFCCs)

There are 12 RFCCs in England. They are responsible for: ensuring coherent plans are in place for identifying, communicating and managing flood and coastal erosion risks across catchments and shorelines; promoting efficient, targeted investment in flood and coastal erosion risk management; and providing a link between flood risk management authorities and other relevant bodies.

#### Environment Agency (EA)

EA is the strategic risk management authority at a national level and is responsible for taking a strategic overview of the management of all sources of flooding and coastal erosion.

#### Risk management authorities (RMAs)

##### Lead local flood authorities (LLFAs)

LLFAs (unitary authorities and county councils) are responsible for developing, maintaining and applying a strategy for local flood risk management in their areas and for maintaining a register of flood risk assets. They also have lead responsibility for managing the risk of flooding from surface water, groundwater and ordinary watercourses.

##### District councils

Key partners in planning local flood risk management. District Councils can carry out flood risk management works on minor watercourses, working with LLFAs and other bodies.

##### Internal drainage boards (IDBs)

IDBs are independent public bodies responsible for water level management in low-lying areas.

##### Highways authorities

Highways authorities are responsible for providing and managing highway drainage and roadside ditches, and must ensure that road projects do not increase flood risk.

##### Water and sewerage companies

Water companies that are responsible for public sewers must ensure those sewers effectively drain the areas they serve.

EA also has operational responsibility undertaken through a network of area offices. This includes managing the risk of flooding from main rivers, reservoirs, estuaries and the sea, as well as being a coastal erosion risk management authority. EA area teams also lead on some capital projects.

- National
- Regional/Local

Source: National Audit Office analysis of Department for Environment, Food & Rural Affairs and Environment Agency documents

**5** In July 2020, the government published its new policy statement on flood and coastal erosion risk management. In conjunction with the policy statement, EA published its *National Flood and Coastal Erosion Risk Management Strategy for England*. These documents set out the government’s ambition to create a nation more resilient to flooding. They mark a shift in policy emphasis from managing flood risk towards creating greater resilience to flooding, recognising that a wider range of actions are now needed in addition to building and maintaining defences to reduce the risk of flooding. These actions include: avoiding inappropriate development in flood plains; using nature-based solutions to control the flow of flood water; better preparing and responding to incidents; and making properties and infrastructure more resilient to future flooding. However, government has not quantified the level of flood resilience or risk reduction it is aiming to achieve in the long term.

**6** Alongside its policy statement, the government announced a new six-year capital investment programme (capital programme) for flood and coastal defence for the period 2021 to 2027. The government committed to better protect 336,000 properties and help avoid £32 billion of wider economic damage by investing £5.2 billion in around 2,000 new flood defence projects. In cash terms, this was double the investment in the previous six-year (2015–2021) capital programme, which better protected 314,000 homes.<sup>1</sup> Government announced a further £370 million of capital funding for 2021–2027 in 2020 for innovative projects and to accelerate work on projects, taking the total capital funding for 2021–2027 to just under £5.6 billion. To measure the capital programme’s performance, Defra and EA have developed a set of 18 metrics with the primary focus on the ‘headline’ metric of the number of properties better protected.

**7** In addition to central government funding, there is a range of other funding sources for flood risk management. Partnership funding is an important source of funding, where risk management authorities raise funds from the public and private sectors towards a flood defence project. EA estimates that £2.3 billion of partnership funding is needed to supplement central government funding for the period 2021–2027. Projects in the capital programme that require partnership funding cannot go ahead until this additional funding is secured.

## **Scope of the report**

**8** We last reported on government’s management of flood risk in November 2020. In this report, we look at the government’s long-term ambition “to create a nation more resilient to future flood and coastal erosion risk” and, in the more immediate term, whether Defra and EA are delivering value for money after two years of the capital programme. To do this, we have assessed Defra’s progress against the backdrop of its 2020 policy statement and EA’s 2020 strategy. We also assess EA’s performance in maintaining existing flood defence assets.

<sup>1</sup> For the 2015–2021 programme, the principal performance measure was the number of homes better protected. For 2021–2027, this has been extended to include non-residential properties.

**9** The report covers:

- the government’s long-term ambition and objectives and Defra’s governance, understanding and management of flood risk (Part One);
- progress on the capital programme to build new flood defences and risks to future delivery (Part Two); and
- EA’s performance in maintaining flood defence assets (Part Three).

**10** While this report looks at aspects of the effectiveness of the overall delivery landscape for flood risk management, we did not audit local authorities or other risk management authorities. We did, however, seek their views on a range of issues. Managing flooding and coastal erosion in Scotland, Wales and Northern Ireland is devolved to the respective administrations and is therefore not within the scope of this report. Our study methods and scope are set out in Appendix One.

## **Key findings**

Governance, understanding and management of flood risk

**11 The government wants to achieve greater resilience to flooding in the long term but has no measure for resilience and no target for the level of flood resilience it expects to achieve.** We expect programmes to have clear objectives and an understanding of what they are trying to achieve. The government’s 2020 policy statement sets out “the government’s long-term ambition to create a nation more resilient to future flood and coastal erosion risk”, but does not set a target for the level of flood resilience it expects to achieve. Both the National Infrastructure Commission and Climate Change Committee have recommended that government sets long-term targets for the level of flood resilience and flood risk it is seeking to achieve. Defra has no plans to introduce a quantified long-term target for flood resilience. Although EA published research in 2022 which explored a range of resilience indicators that could be introduced, Defra did not meet its policy statement commitment to develop a national set of indicators by spring 2022. These indicators were to monitor trends over time to better understand the impact of its policies, and to strengthen reporting of progress towards its goals so it is clearer and more accessible. They have still not been developed but Defra told the Public Accounts Committee (PAC) in May 2023 that it would provide an update on progress on this by the end of 2023 (paragraphs 1.2 to 1.6).

**12 EA has set out short-term actions in its roadmap to 2026 but these are not sufficient to achieve its long-term objectives to 2050, and it has not yet established any plans or milestones to bridge the gap.** EA's 2020 strategy includes a number of long-term objectives to 2050. EA is taking forward work to help it and government better consider flood risk in the long term, for example, through its work on long-term investment scenarios, which provide a range of investment scenarios over a 50-year period. However, there are no plans beyond 2026 to bridge the gap between the results of its shorter-term actions and the requirements of its long-term objectives. EA has set out a range of short-term actions to support delivery of the strategy, firstly in its Action Plan covering 2021-22 and then in its strategy roadmap containing actions it, and other bodies, will take by 2026. EA's monitoring shows it is making good progress against the actions in its roadmap. EA is planning to review its 2020 strategy in 2026, at which point it will update the shorter-term measures set out in its roadmap. However, EA has no plans to develop a long-term set of key milestones and dates for delivering its ambition for a more resilient nation. In addition, Defra's policy statement contains 49 actions. Many of these are not time-bound but, of those that are, none has a target date beyond 2027 (paragraphs 1.6, 1.7 and 1.11).

**13 EA's work to update its National Flood Risk Assessment model has the potential to provide a much-improved understanding of flood risk.** Our 2020 report highlighted the gaps in Defra's and EA's understanding of flood risk and how flood risk is changing over time. EA is developing a new National Flood Risk Assessment (NaFRA2), which it states will improve its assessment in areas such as surface water flood risk and the impacts of climate change. The methodology has been updated since the previous model and will build up an assessment of risk from local models. This will allow more accurate tracking of changes in risk over time. EA is confident that NaFRA2 will be ready on time, towards the end of 2024, with the planned functionality. NaFRA2 will be used to update EA's long-term investment scenarios (paragraphs 1.8 to 1.11 and Figure 3).

**14 Defra has created a new board to improve its engagement with the capital and maintenance programmes and strengthen its oversight.** In response to our 2020 report, Defra has strengthened its oversight of the capital and maintenance programmes with the establishment, in July 2021, of the Flood Investment Portfolio Board (the Board). The Board has introduced 22 metrics to measure progress and has also developed a risk register. Both Defra and EA are positive about how the new Board is working (paragraphs 1.12 to 1.14).

**15 There are weaknesses in the quality of the data EA is using to manage its programmes and report progress.** During our fieldwork, we requested a range of management information from EA and encountered significant issues with the quality of the data systems and information EA is using to manage and report progress on the capital and maintenance flood programmes. These included issues around the consistency, completeness and accuracy of data on, for example, partnership funding and the condition of its assets. The Comptroller and Auditor General's report in EA's 2021-22 annual report and accounts highlighted concerns with data quality on EA's asset records. EA internal audit reports have also raised concerns about data quality. Defra and EA told us that they had put significant effort into improving data quality, and EA has an ongoing Delivery Portfolio Improvement Plan, which includes improving data and systems over the next year. However, EA analysis in June 2023 indicated there are still gaps in EA's asset database. Defra also highlighted ongoing issues with the quality of data provided by other risk management authorities. Taken together, these weaknesses cast doubt on the quality of some Board reporting, which could mean members are not aware of the extent of risks to delivery (paragraphs 1.16 to 1.18).

#### Progress on the capital programme

**16 By 2027, the capital programme is likely to provide better protection to around 40% fewer properties than EA originally planned.** The number of properties better protected is the primary performance indicator for the capital programme. In 2020 when the capital programme was originally announced, government committed to spend £5.2 billion to better protect 336,000 properties by 2027. In the first two years, EA has delivered 59,000 properties better protected and has spent £1.4 billion. However, EA has since reduced its forecast to 200,000 properties better protected by 2027, a reduction of 40%. EA estimates that this provides a benefit-cost ratio of 4.8 to 1. Defra is developing proposals for HM Treasury on the reprofiling of the capital programme, so this forecast is not yet an agreed target. Even delivering to this lower forecast relies on projects with only medium or low delivery confidence and on projects that are still in the design or pipeline stage (paragraphs 2.1 to 2.6 and Figure 4).

**17 There are a number of reasons for the reduced forecast for properties better protected, some of which were beyond EA's and Defra's control.** The capital programme got off to a slow start because EA was still completing projects from the previous programme, despite £100 million being brought forward to support delivery of the capital programme. It also faced challenges from the COVID-19 pandemic and EU Exit which caused supply chain difficulties and reduced the availability of skilled workers. There was an underspend of £310 million in the first two years of the programme and HM Treasury has deferred this funding for use in later years. Other factors are having a continuing impact:

- Inflation has had a significant impact on project costs and on the programme outcomes. EA estimates that inflation is the cause of between a half and two-thirds of the reduction in the forecast number of properties better protected.
- Delivery is being slowed by capacity and skills shortages both in EA and local authorities as a result of, for example, a highly competitive external jobs market and the need to create new posts to manage the increased size of the capital programme.
- Changes in 2021 to Defra's funding rules and EA's processes for the capital programme did not go far enough in streamlining the processes for smaller projects.
- The business case process is taking longer. EA is currently investigating the reasons for this but told us it is partly due to increasing inaccuracy and uncertainty of information in project business cases and also the increased complexity of projects (paragraphs 2.4, 2.14 to 2.25 and 2.34).

**18 EA has reduced its forecasts for the environmental benefits the capital programme will deliver.** With fewer projects in the capital programme, EA has fewer opportunities to achieve environmental benefits. EA now forecasts that it will create or improve 3,875 hectares of habitat compared with an original target of 5,440 (a reduction of 29%) and enhance 684 kilometres of river compared with the original target of 830 (a reduction of 18%). As part of a government-wide commitment to increase the number of projects it funds that include nature-based solutions to reduce flood and coastal erosion risk, EA committed to doubling the number of projects in the floods programme that include nature-based solutions from the 130 that were included in the 2015–2021 programme to 260. EA reduced its forecast to 144 in July 2023. In September 2023, Defra and EA announced that £25 million of the capital programme budget would be set aside for projects that use nature – such as restoring wetlands or planting trees – to protect communities from flooding. With this funding, EA now expects to achieve the target of 260 projects (paragraph 2.7 and Figure 6).

**19 There are wide regional variations in flood defence investment which are not explained by the relative levels of flood risk.** For example, average capital expenditure per property at risk in the North-East of England is £12,563, four times that in the East and West Midlands. Defra says that the amount of investment in an area is governed by the number of feasible projects available and their benefits as well as where flood risk is greatest. However, our concern is that other considerations, for example the availability of partnership funding contributions, are also likely to be factors. EA publishes annual analysis of investment levels and properties better protected by region and, in response to the PAC report on managing flood risk, published in February 2021, investment in deprived areas. PAC also recommended that Defra follows up this analysis with action to reduce any funding inequality. Defra told us it is concluding analysis to understand the key drivers of these regional investment disparities. It is using some of the capital programme funding to support projects that are having difficulties securing partnership funding. PAC also recommended that Defra should identify areas where there is likely to be a shortfall in local authority resources and private sector contributions to ensure effective flood risk management in all local areas. Defra is working on this, but it is not expecting to complete it until winter 2023-2024, two years later than its previous undertaking to the Committee (paragraphs 2.8 to 2.10 and 2.12).

**20 There are several risks that could lead to EA delivering even fewer properties better protected than its reduced 200,000 forecast by 2027.**

- a Partnership funding:** EA currently estimates that £2.3 billion of partnership funding is needed for the capital programme. In July 2023, £800 million partnership funding was yet to be secured, of which EA estimates that £450 million is associated with projects to better protect properties by March 2027. Ongoing inflationary pressures are likely to further increase the need for partnership funding. Private sector businesses are major beneficiaries from largely public sector funded defences: EA estimates that between 27% and 57% of the economic costs of damage due to floods are costs to businesses. Despite this, little partnership funding has been secured from the private sector: across the capital programme to date, only 9% (£128 million) of the total partnership funding has been secured directly from the private sector, although this is an increase from the £39 million secured during the 2015–2021 capital programme. Defra has not set a target for the level of partnership funding it is seeking from the private sector, either on a project-by-project basis or overall (paragraphs 2.26 to 2.28).
- b Reliance on large projects:** delivery of the target is dependent on a small number of very large projects: 43 projects are expected to deliver around two thirds of the forecast properties better protected. Any delays to these projects beyond the end of the capital programme would significantly affect the number of properties better protected achieved by the capital programme (paragraph 2.29 and Figure 12).

- c Projects led by risk management authorities (RMAs):** RMA-led projects are expected to deliver 49% of the properties better protected. EA considers these projects to be riskier because it has less direct control over their delivery. They are also scheduled for delivery later in the capital programme: 39% of the RMA-led properties better protected are due to be delivered in the final year of the capital programme compared with 16% of EA-led. Minor delays to these RMA-led projects could further reduce the number of properties better protected by the end of the programme (paragraphs 2.30 and 2.31 and Figure 13).

**21 EA's past attempts to accelerate projects have increased costs and delays and this remains a risk for the programme.** Due to the deferment of the underspend in the first two years of the programme, and investment at record levels, EA will need to invest an average of almost £1 billion for each of the remaining four years of the programme. Rigidly applied funding periods and targets can create risks to value for money when there is pressure to spend money or achieve targets by the end of the period. At the end of the 2015–2021 programme, EA attempted to accelerate some projects so that the properties better protected could be counted towards that programme's targets. This brought risks: for example, the Boston Barrier project in Lincolnshire was accelerated in a phased way so that the 13,000 properties that were better protected by March 2021 could contribute to the target. But final completion of the project is now delayed by more than four years and costs have increased from £124 million to £184 million. While there is no overall policy to accelerate the capital programme, EA has accelerated 19 of its largest 55 projects in the 2021–2027 capital programme. EA's analysis of these projects suggests that projects that have been accelerated are more likely to experience overspends: of the 19 accelerated projects, 68% are forecast to be at least 25% over budget compared with 28% of the 36 projects that were not accelerated. EA told us that some of these cost increases are costs that were not identified earlier because of the speed at which the business cases were developed (paragraphs 2.32 to 2.34).



## Maintaining flood defence assets

**22 EA is not maintaining its flood defences to a level that optimises value for money.** EA has assessed that maintaining 98% of high consequence flood defence assets at their required condition will provide optimal value for money and this would require additional investment.<sup>2</sup> It has not achieved this level for its assets in high consequence systems over the past five years.<sup>3</sup> In summer 2023, only 93.5% of EA's assets in high consequence systems were being maintained at the required condition. This is below the 94%–95% level of maintenance agreed with Defra in the 2021 Spending Review settlement. This means that, as at summer 2023, 203,000 properties are at increased flood risk because more EA assets are below the required condition. At the same time, EA estimates that a further 50,000 properties were at risk from flooding due to assets owned by third parties being below required condition, taking the total to 253,000. EA emphasised that an asset being below required condition does not necessarily mean it has structurally failed, or that its performance in a flood is compromised, rather that the probability that it will not perform as designed is increased (paragraphs 3.6, 3.7, 3.13 and 3.14, and Figure 15).

**23 A key reason for properties being exposed to additional flood risk is a shortfall of £34 million in EA's maintenance funding for 2022-23.** In the 2021 Spending Review, EA estimated the funding needed to maintain 98% of its high consequence assets at the required condition, which would minimise total expenditure in the long term, was £235 million a year. Defra and HM Treasury agreed a total resource budget between 2022-23 and 2024-25. Following Defra's 2022-23 business planning, it set EA an overall floods resource budget of £300 million a year for that period. This included nominal flood defence maintenance allowances of £201 million for 2022-23 and £196 million for 2023-24, which EA considered would allow 94%–95% of assets in high consequence systems to be maintained at the required condition. The budget for 2022-23 represented a £22 million (12%) increase from the previous settlement of £179 million for 2021-22. Defra has provided EA with an indicative resource budget for its floods work in 2024-25 and EA told us it is currently working to the assumption of £190 million funding for maintenance in 2024-25. Short-term resource funding settlements are a challenge for EA in planning its maintenance programme and introduce uncertainty for recruitment (paragraphs 3.8 and 3.9 to 3.11).

2 EA's flood risk management assets are assigned a condition grade using a visual asset inspection. This is a grade between 1 and 5. Most of EA's assets are set a target condition grade of 3 (Fair). 'Below required condition' means the asset is in condition 4 or 5, or below its target condition.

3 EA divides flood defence assets into high, medium and low consequence asset systems depending on the number of properties they work together to protect: high consequence systems are those that protect a high number of properties.

**24 Defra and EA did not explore with HM Treasury the potential to use part of the capital budget underspend to address the shortfall in maintenance funding in 2022-23.** The number of properties (203,000) at increased risk due to EA maintaining only 93.5% of its high consequence assets at required condition, instead of the 98% that EA considers optimal, exceeds the forecast of 200,000 properties better protected through the capital programme. These figures are not directly comparable: new flood defences provide benefits over a long time period whereas benefits from annual maintenance spending may be shorter term, and the reductions in the scale of risk resulting from maintenance may not be equivalent to the increased protection provided by new flood defences. However, taken together, the two figures suggest there may sometimes be a case for switching funding from the capital programme into maintenance (funded by 'resource' spending) to manage the overall flood risk when capital spending is delayed. HM Treasury offers some flexibility for departments to switch funding between capital and resource, for example, if capital spending is delayed. In order to move money from its capital programme to its maintenance programme, Defra would require HM Treasury approval. HM Treasury has deferred the £310 million underspend in the first two years to later years of the capital programme. Defra considered that this represents value for money because of the positive benefit-cost ratio of the programme as a whole. However, Defra and EA did not assess whether using part of this underspend to meet the shortfall in its maintenance budget in 2022-23 would provide better value for money and did not ask HM Treasury for this flexibility. Defra has provisionally agreed with HM Treasury to switch £25 million from the capital programme to fund maintenance in 2023-24 and Defra is discussing with EA the extent to which this can increase the proportion of its high consequence assets at required condition (paragraphs 3.11 and 3.14).

### **Conclusion on value for money**

**25** To combat the growing dangers from flooding, the government has doubled its capital funding in England for the six years to 2027. To manage the larger capital programme and record levels of investment, Defra has intensified its scrutiny and is taking steps with EA to develop a more granular understanding of flood risk. However, the capital funding is forecast to deliver protection to far fewer properties by 2027 than was promised when the capital programme was launched. Due to underspending in the first two years of the programme, EA will need to achieve record levels of investment in the remaining four years of the programme to spend the full £5.2 billion allocated to the programme. There is a risk that value for money will be further eroded if projects are accelerated or new projects are introduced too quickly to meet this level of investment. On top of this, EA's maintenance of its assets is not optimising value for money. For the lack of £34 million in annual maintenance funding for 2022-23, more than 200,000 properties are at increased risk of flooding. At the same time, EA underspent by £310 million in the first two years of the capital programme. Neither Defra nor EA assessed whether using some of this underspend to meet the shortfall in its maintenance budget in 2022-23 would have provided better value for money than deferring it to later in the capital programme.

**26** The government acknowledges that building new flood defences and maintaining existing ones is no longer enough and that a wider range of interventions is now needed to build resilience against increasing flood risk. Although the government's vision for flood resilience stretches to the year 2100 and EA has a number of strategic objectives for 2050, it has not set a target for the level of flood resilience it expects to achieve and has not mapped out any solid plans beyond 2026 to bridge the gap between its shorter-term actions and long-term objectives. This will make it difficult for the government to make rational and informed decisions about its priorities, measure its progress or plan effective investment for the long term.

## **Recommendations**

**27** Defra, EA and HM Treasury should:

- a** work together to ensure that decisions on the current reprofiling of the capital programme are not influenced by short-term funding periods and targets and are focused on maximising long-term value for money; and
- b** by April 2024, explore how to ensure there is the necessary flexibility to easily switch money from the capital programme into the asset maintenance budget where it is value for money, and ensure the decision-making process is streamlined to enable timely decisions to be made. Defra and EA should undertake a timely assessment of the value for money of such options going forward to inform this decision-making process.

**28** Defra and EA together should, as part of planning for the next capital programme:

- c** consider how they expect the profile of projects to change in size and nature and implement any partnership funding policy, rule or process changes that may be needed well in advance of the next capital programme;
- d** take realistic account of staff resource constraints when setting out the objectives, scope and ambition of the next capital programme and the impacts on whole-life asset management;
- e** assess how well the geographical distribution of investment reflects needs at a local level and publish their findings by the end of 2024 together with proposals to mitigate any funding inequalities that this may identify; and
- f** engage over the next year with the private sector at a national and local level to publicise the benefits the private sector derives from the capital programme and encourage increased private sector financial contribution to the capital programme to reflect these benefits. Defra should also set a target for private sector partnership funding contributions for the next capital programme.

**29** EA should:

- g** before planning starts for the next capital programme, develop a set of key long-term milestones and dates which chart the course towards becoming a nation resilient to flooding by 2100. This should look to cover a timetable comparable with the long-term investment scenarios 50-year view of flood risk and investment, and which goes beyond the six-yearly roadmap planning. It should include an integrated assessment of maintenance and capital spend to secure value for money;
- h** in the next 12 months, develop a plan of work to investigate the reasons for the increased inaccuracy and uncertainty in its business case forecasts and, based on the findings, put in place remedial actions; and
- i** ensure that the Delivery Portfolio Improvement Plan delivers against its data and systems objectives by April 2024 to ensure the data EA collects and uses are complete, consistent and accurate, and provides the transparency needed by senior officials and ministers to fully understand the risks to progress. EA should review the position in April 2025 to ensure these objectives have been met and that data are of the required quality. In addition, EA should continue to improve its existing asset data in the AIMS:OM system with a target completion date of March 2025.

# Part One

## Governance, understanding and management of flood risk

**1.1** This part considers the government’s ambition for flood risk management in England and whether it is supported by appropriate long-term objectives and plans. We then examine how well flood risk is managed, including: the Department for Environment, Food & Rural Affairs’ (Defra’s) and the Environment Agency’s (EA’s) understanding of flood risk; Defra’s new governance arrangements; and the quality of EA’s data.

### **The government’s long-term ambition and objectives**

**1.2** Both the government’s 2020 policy statement and EA’s 2020 strategy mark a shift in policy emphasis from managing flood risk towards creating greater resilience to flooding.<sup>4</sup> The government’s 2020 policy statement sets out “the government’s long-term ambition to create a nation more resilient to future flood and coastal erosion risk”. EA’s strategy highlights a range of actions needed alongside building and maintaining defences to reduce the risk of flooding. These include:

- avoiding inappropriate development in flood plains;
- using nature-based solutions to slow the flow or store flood waters;
- better preparing and responding to incidents through timely and effective forecasting, warning and evacuation;
- helping communities and local economies recover after a flood; and
- making properties and infrastructure more resilient to future flooding.

**1.3** The government has provided £200 million for a Flood and Coastal Innovation Programme with £150 million to enable local authorities, businesses and communities in 25 locations to test and demonstrate innovative practical resilience actions.

<sup>4</sup> HM Government, *Flood and coastal erosion risk management: Policy Statement*, July 2020; Environment Agency, *National Flood and Coastal Erosion Risk Management Strategy for England*, 2020.

**1.4** Despite this shift in policy emphasis, Defra's policy statement does not quantify the level of flood resilience or risk reduction the government aims to achieve in the long term, or by when it hopes to achieve it. We expect programmes to have clear objectives and an understanding of what they are trying to achieve, such as a net reduction in flood risk. Without these, it is not possible to plan, monitor and evaluate strategies and programmes effectively. Both the National Infrastructure Commission and Climate Change Committee have recommended that government sets long-term targets for flood resilience and flood risk.

**1.5** The government's long-term ambition is for a nation more resilient to flooding and coastal change and EA recognises the need to quantify longer-term objectives for flood resilience. Defra and EA have led research to understand more about the concept of flood resilience and to identify potential flood resilience indicators.<sup>5</sup> This research identified a set of 34 indicators, 14 of which are ready to be measured with data or information already available. The remaining 20 need development before they can be used. EA plans to use its innovation programme to further test and refine the proposed indicators.

**1.6** Recognising the need to improve how it monitors progress, Defra included an action in its policy statement to develop a national set of indicators by spring 2022. It also aimed to monitor trends over time to better understand the impact of its policies and strengthen reporting of progress towards its goals so it is clearer and more accessible. It did not meet this target date and the work has not yet been completed. In a May 2023 letter to the chair of the Public Accounts Committee (PAC), Defra said it would provide an update on progress on this at the end of 2023.<sup>6</sup> Defra told us it has no plans to introduce a single quantified long-term objective for flood resilience as part of this work.

5 Department for Environment, Food & Rural Affairs, Environment Agency, Natural Resources Wales, the Welsh Government, *Evidence Review of the Concept of Flood Resilience*, May 2020; Department for Environment, Food & Rural Affairs, Environment Agency, Natural Resources Wales, the Welsh Government, *Measuring resilience to flooding and coastal erosion*, November 2022.

6 Letter from Defra to chair of PAC, May 2023: <https://committees.parliament.uk/publications/40103/documents/195619/default/>

**1.7** The government’s ambition for a nation more resilient to flooding and coastal change is supported by EA’s 2020 strategy and a number of long-term objectives to 2050. EA is also taking forward work to help government better consider flood risk in the long term, for example, its long-term investment scenarios work. However, this is not supported by any plans beyond the end of the current six-year capital programme to bridge the gap between the shorter-term actions and long-term objectives. Following publication of its strategy, EA set out a range of short-term actions to support delivery of the strategy, firstly in its Action Plan covering 2021-22 and then in its strategy roadmap containing actions it, and other bodies, will take by 2026. EA’s monitoring shows it is making good progress against the actions in its roadmap. EA is planning to review its 2020 strategy in 2026, at which point it will update the shorter-term measures set out in its roadmap. However, EA has no plans to develop a long-term set of key milestones and dates for delivering its ambition of a more resilient nation. In addition, Defra’s policy statement contains 49 actions. Many of these are not time-bound but, of those that are, none has a target date beyond 2027. Our report *Support for innovation to deliver net zero* highlighted the benefits of long-term planning. It concluded that government’s creation of a framework clarified its priorities in pursuit of net zero and helped to communicate these priorities.<sup>7</sup> This framework sets out the challenge areas which government will focus on over different timescales up to 2050.

## **Understanding flood risk**

**1.8** Our 2020 report highlighted the shortcomings in Defra’s and EA’s understanding of flood risk and how it is changing over time. EA estimated that the capital programme would better protect 336,000 properties. However, this number does not take account of properties that will become less well protected over the period due to factors such as new housing development, climate change and the deteriorating condition of existing flood defence assets. EA also estimated that the capital programme would reduce flood risk by “up to 11%” but acknowledged that this estimate was based on a high-level model and that the method of calculation has not been improved over the past six years.<sup>8</sup>

<sup>7</sup> Comptroller and Auditor General, *Support for innovation to deliver net zero*, Session 2022-23, HC 1321, National Audit Office, May 2023.

<sup>8</sup> Comptroller and Auditor General, *Managing flood risk*, Session 2019–2021, HC 962, National Audit Office, November 2020.

**1.9** EA’s latest annual flood and coastal erosion risk management report indicates that the number of properties at flood risk has increased by around 500,000 between 2021-22 and 2022-23 to around 5.7 million. It indicates that the number of properties with a medium to high risk of flooding from rivers and the sea (equal to or greater than 1% likelihood of flooding in any given year) has increased by 78,000 between 2021-22 and 2022-23 to 900,000.<sup>9</sup> EA reports that this is due to a better understanding of the level of risk, through improved information, rather than an increase in risk. This is based on EA’s current National Flood Risk Assessment model, which it considers requires updating. EA is updating its risk assessment model and expects to launch a new National Flood Risk Assessment (NaFRA2) towards the end of 2024.

**1.10** NaFRA2 uses a different methodology from the previous assessment model, building up an assessment of risk from local models. This will allow more accurate tracking of changes in risk over time. It is therefore an important part of improving Defra’s and EA’s understanding of flood risk with the potential to significantly improve assessment in areas such as surface water flood risk and the impacts of climate change (see **Figure 3**). We have not assessed progress on the NaFRA2 project, but EA said it is confident that it will be ready on time, towards the end of 2024, with the planned functionality.

**Figure 3**

Comparison of the new National Flood Risk Assessment (NaFRA2) with the current National Flood Risk Assessment (NaFRA)

**NaFRA2 aims to improve government’s understanding of flood risk**

	Current NaFRA	NaFRA2
Outputs	One main risk output: the risk of flooding from rivers and seas, showing the chance of flooding taking into account flood defences and their condition	Range of output datasets with ability to run bespoke outputs
Resolution	Based on 50-metre grid cells	Outputs based on the new national model with two-metre grid resolution and local models of varying resolution
Impact analysis	Property count and damages	Wider range of impacts including properties and infrastructure, direct and indirect impacts
Climate change scenarios	No	Yes
Water depth and speed information	No	Yes

Source: National Audit Office analysis of Department for Environment, Food & Rural Affairs and Environment Agency documents

<sup>9</sup> Environment Agency, *Flood and coastal erosion risk management report: 1 April 2022 to 31 March 2023*, September 2023.



**1.11** NaFRA2 should allow an improved assessment of flood risk in England and provide enhanced inputs into other analysis, for example:

- assessing the impact of the capital programme through NaFRA2's ability to differentiate between risk reduction from the capital programme, and other changes in risk; and
- long-term investment scenarios (LTIS): EA uses LTIS to provide a series of economic assessments of future flood and coastal erosion risk management. The current LTIS covers a 50-year investment period from 2014 to 2063. Following the update to NaFRA, EA told us it expects to update LTIS in 2025. NaFRA2 information on, for example, flood depths will provide significant improvements in areas such as assessing the need for investment in property-level flood resilience measures.

## **Oversight and assurance**

**1.12** Our 2020 report found that Defra was not doing enough to challenge EA's approach and performance and recommended that Defra reviews its oversight of the capital programme.<sup>10</sup> In response, Defra established the Flood Investment Portfolio Board (the Board), whose membership includes senior officials from Defra (including some from outside the floods area such as portfolio management and finance) and EA. It met for the first time in July 2021, and quarterly thereafter, with a remit covering both the capital and asset maintenance programmes.

**1.13** Both Defra and EA are positive about how the Board is working and told us it has improved understanding and oversight and facilitated joint working. Defra told us the Board marked a step-change in governance, providing it with a deeper knowledge of the programmes and better understanding of the risks to delivery. EA said it was a useful forum where issues can be more effectively shared and escalated to senior Defra officials, for example regarding the impact of inflation. The Board also provides the opportunity for EA to better understand the interplay between the programmes and other areas of Defra policy, such as the Farming and Countryside Programme. EA commented that it would be even more useful if relevant Defra officials could attend when wider issues are discussed.

**1.14** The Board has agreed 22 programme metrics that it uses to measure progress on the capital and maintenance programmes. Four of these are not yet in use because Defra and EA have not yet started collecting and reporting the data. Its primary metric for the capital programme is the number of properties better protected. The Board also has a risk register, which Defra told us has input from a range of teams across Defra as well as from EA.

<sup>10</sup> See footnote 8.

**1.15** Following an Independent Peer Review conducted by the Infrastructure and Projects Authority (IPA) in October 2022, the capital programme was added to the IPA's Government Major Projects Portfolio (GMPP) in April 2023. The GMPP comprises the largest, most innovative and highest-risk projects and programmes delivered by the government. The highest-priority projects and programmes on the GMPP receive independent scrutiny and assurance from the IPA. The IPA reviews the delivery confidence risk of these projects and has rated the capital programme as red. Prior to this, only larger individual projects within the capital programme have been included in the GMPP. The IPA review also made several recommendations to strengthen governance as part of the programme's entry into the GMPP. One of these was for more formal engagement of Defra, IPA and HM Treasury at a capital programme level through the establishment of a programme board. Defra, with support from EA and advice from the IPA, is considering how this would work alongside the Flood Investment Portfolio Board.

### **Quality of data**

**1.16** To support this study, we requested a range of management information from EA and encountered several issues with data quality, for example, data on partnership funding and the condition of its assets. We have not undertaken a detailed audit of EA's data systems, but these issues have raised concerns about the consistency, completeness and accuracy of the data systems and information EA is using to manage and report on the capital and maintenance programmes. These weaknesses cast some doubt on the quality of Board reporting, which could mean Board members are not aware of the extent of risks to delivery. EA has large volumes of data, but acknowledges that it has long-standing issues with quality, completeness and comparability between datasets and that this affects the whole of EA, not just the floods function.

**1.17** The Comptroller and Auditor General's report in EA's 2021-22 annual report and accounts highlighted concerns with data quality in EA's underlying asset records. EA internal audit reports have also raised concerns about data quality, for example:

- EA's ambition is for all projects to report progress using its Asset Information Management System Programme Delivery (AIMS:PD). However, an internal audit report in June 2022 found that 52% of EA's area team-led projects (which EA estimates to be around 15% of all projects in the capital programme) were reporting progress through alternative manual processes. This was inefficient and increased the risk of data errors and omissions. EA is tracking and reporting on performance and compliance of the use of AIMS:PD while also working on promoting the benefits of AIMS:PD to its area teams; and
- a November 2022 report stated that the transfer of data from legacy systems to EA's Asset Information Management System Operation and Maintenance (AIMS:OM) system was continuing. It reported issues concerning the transfer of data and matching categories from legacy systems to categories within AIMS:OM and that work to rectify these issues was continuing.

**1.18** Both Defra and EA told us that they had put significant effort into improving data quality, with papers for Defra's Flood Investment Portfolio Board (November 2022) reporting that 80% of targeted data corrections had been completed for the AIMS:OM system. EA has an ongoing Delivery Portfolio Improvement Plan which includes improving data and systems over the next year. EA data in June 2023 indicated that gaps remained in the AIMS:OM data. This matches our experience of data provided from the asset database. EA analysis showed that 80% of new assets added to its database have missing data, such as what type of flood defence asset it is or its length or height. Defra also highlighted ongoing issues with the quality of data provided by other risk management authorities.

## Part Two

### Progress on the capital programme

**2.1** In 2020, the government announced a new six-year capital investment programme for flood and coastal defence for the period 2021 to 2027. It committed to better protect 336,000 properties by investing £5.2 billion in around 2,000 new flood defence projects. An initial longer list of around 2,600 projects allowed for some attrition with the Environment Agency (EA) estimating that around 2,000 projects would be completed. In cash terms, the capital programme is double the £2.6 billion investment of the previous six-year capital programme, which ran between 2015 and 2021 and provided better protection for 314,000 homes, exceeding its target of 300,000 homes. The overall value for money has reduced for the current capital programme as higher-impact projects were undertaken first in the previous programme. A further £370 million of capital funding was announced in 2020 for innovative projects and to accelerate work on projects, taking the total capital funding to just under £5.6 billion.

**2.2** In this part, we assess whether the government is on track to achieve its aims after the first two years of the capital programme. We assess progress on the basis of the number of properties better protected, the government's primary performance measure, as well as examining progress towards environmental goals and the geographical distribution of the capital investment. We then set out some current and future risks that are hindering progress and reducing the benefits the capital programme will deliver.

## Current progress

### Properties better protected

**2.3** The Department for Environment, Food & Rural Affairs (Defra) and EA have developed a set of 18 performance metrics for the capital programme, with a further four for the maintenance programme. However, Defra's primary focus is on the 'headline' metric of properties better protected. It is an improvement on 'homes better protected', the metric used for the previous programme, as it now includes non-residential buildings. The properties better protected measure is an easy-to-understand performance measure but, on its own, it does not provide a good view of progress in tackling overall flood risk because it does not take account of properties that have become less well protected over the period due to factors such as housing development, climate change and the condition of flood defence assets. EA also stated that over-reliance on the headline 'properties better protected' target risks taking investment away from more innovative projects. It nevertheless remains the main metric the government uses to judge progress of the capital programme.

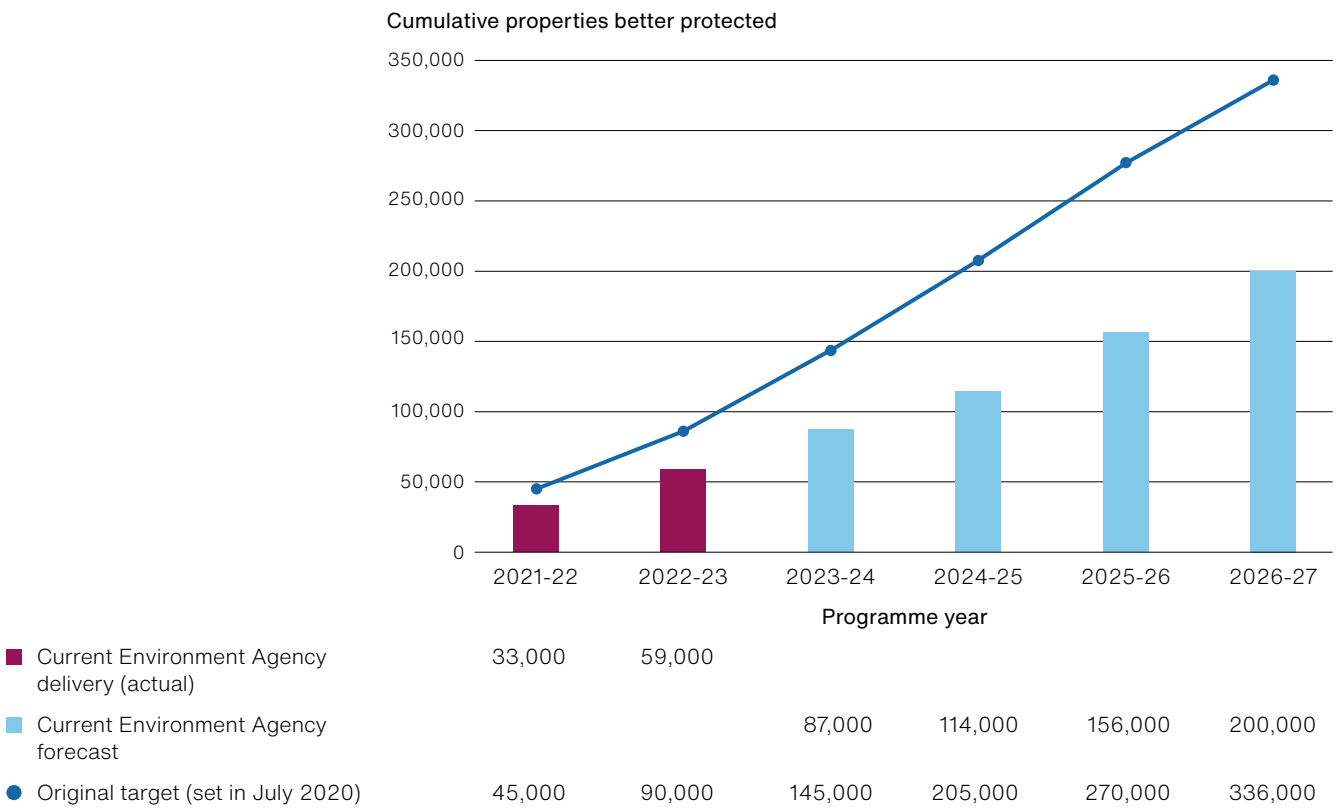
**2.4** The capital programme got off to a slower start than planned, because EA needed to focus on completing projects in the previous programme. This reduced resources available for establishing a pipeline of projects for the new capital programme, despite HM Treasury and Defra agreeing to bring forward £100 million to support delivery of the 2021–2027 capital programme. EA also had to contend with the COVID-19 pandemic, and the UK's departure from the EU, which reduced the availability of skilled workers and created supply chain difficulties. This, combined with other ongoing challenges discussed below, has resulted in EA reducing its forecast for the benefits the capital programme will now deliver.

**2.5** EA now expects to invest in around 1,500 projects as it considered cost pressure from inflation made its original intention to invest in 2,000 projects unaffordable within the capital programme's £5.2 billion six-year funding envelope. EA told us that the schemes which are no longer affordable will be part of the pipeline for any future programmes. The remaining 1,500 projects are expected to better protect a maximum of 229,000 properties, but EA's latest central forecast is that these projects will, after attrition, provide better protection for 200,000 properties by March 2027, a reduction of 40% on the original target (**Figure 4** overleaf). EA estimates that this provides a benefit-cost ratio of 4.8 to 1. Defra is developing proposals for HM Treasury on the reprofiling of the capital programme, so this forecast is not yet an agreed target. EA still expects expenditure between 2021 and 2027 to total £5.2 billion. In the first two years, EA has delivered 59,000 properties better protected and has spent £1.4 billion.

**Figure 4**

Forecast for properties better protected in the 2021–27 capital programme

The Environment Agency’s latest forecast for properties better protected is significantly lower than the original target set in July 2020



**Note**

1 Data provided by the Environment Agency in October 2023.

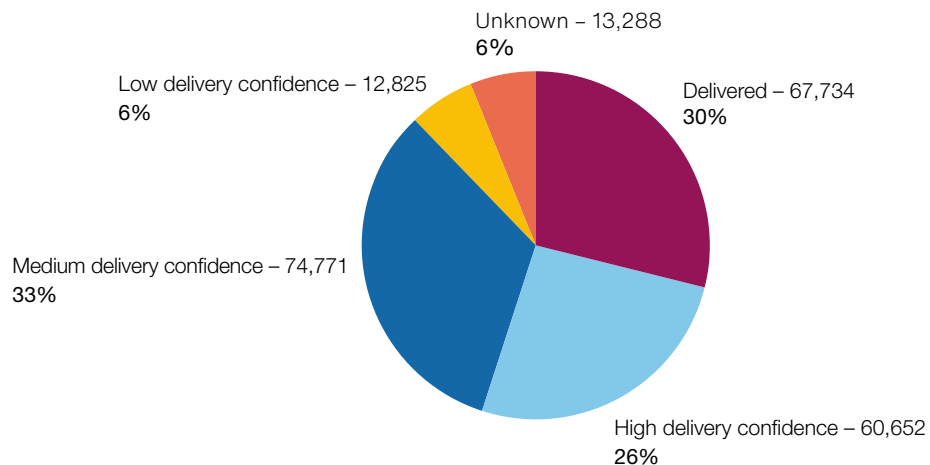
Source: National Audit Office analysis of Environment Agency data

**2.6** Many of the projects currently in the capital programme are still in the pipeline or only at design stage. To reach its forecast of 200,000 properties better protected through the capital programme by March 2027, EA has to rely on projects that it rates as having only medium or low delivery confidence. Only 56% of the 229,000 properties better protected (before attrition is factored in) in the capital programme are from projects that have either already been delivered or have a high delivery confidence (**Figure 5**). Assuming all the high delivery confidence projects are delivered on time, 71% of the properties better protected from projects with medium, low or unknown delivery confidence will be needed to reach 200,000.

### Figure 5

Project delivery confidence by expected properties better protected for projects in the capital programme, September 2023

**Only 56% of the properties better protected are from projects either already delivered or from projects rated as high for delivery confidence**



#### Notes

- 1 Figure is based on the total number of properties better protected of 229,270.
- 2 Data provided by the Environment Agency in October 2023.
- 3 Percentages do not add to 100 due to rounding.

Source: National Audit Office analysis of Environment Agency data

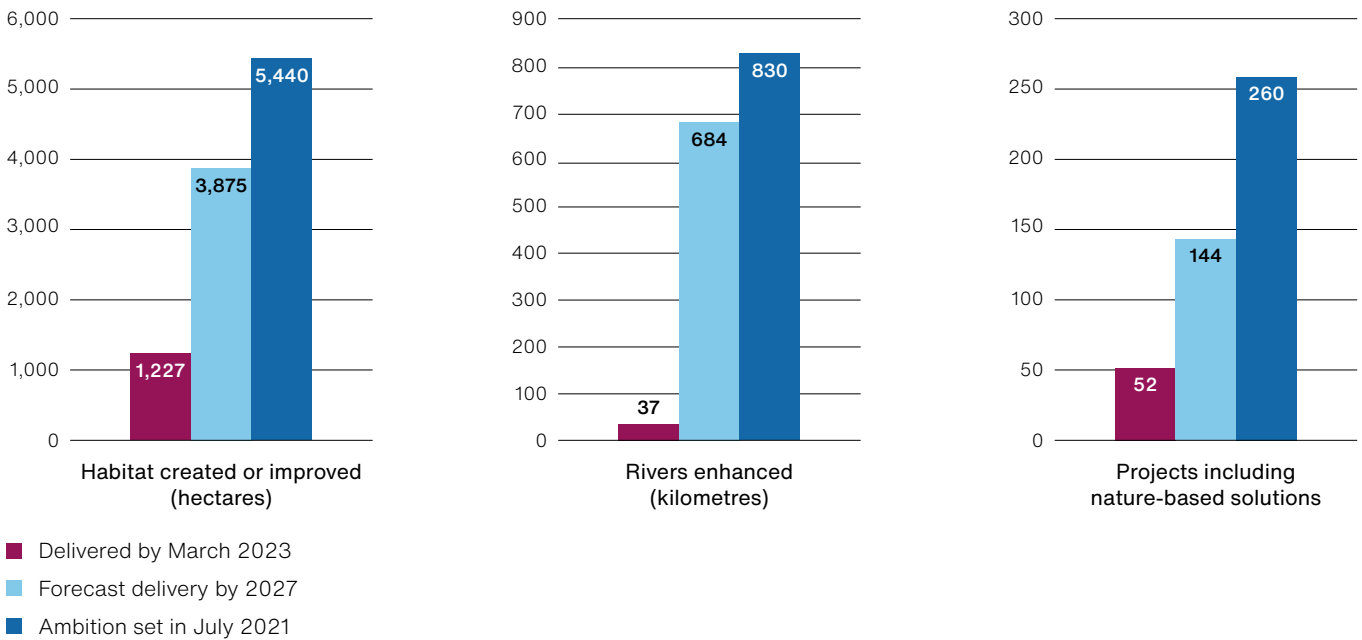
## Environmental ambitions

**2.7** EA has reduced its forecasts for the environmental benefits the capital programme will deliver. With fewer projects in the capital programme, EA has fewer opportunities to achieve environmental benefits. In Defra's policy statement one of the five main policy areas is "harnessing the power of nature to reduce flood and coastal erosion risk and achieve multiple benefits". As part of a government-wide commitment to increase the number of projects it funds that include nature-based solutions to reduce flood and coastal erosion risk, EA committed to doubling the number of projects that include nature-based solutions from the 130 that were included in the 2015–2021 programme to 260. EA's ambitions for the capital programme, in addition to better protecting properties, include creating or improving 5,440 hectares of habitats and enhancing 830 kilometres of river. In July 2023, EA forecast a substantial shortfall on each of these three environmental ambitions (**Figure 6** overleaf). In September 2023, Defra and EA announced that £25 million of the capital programme budget would be set aside for projects that use nature (such as restoring wetlands or planting trees) to protect communities from flooding with projects delivered between 2024 and 2027. As a result, EA now expects to meet the original commitment for 260 projects including nature-based solutions.

**Figure 6**

Forecast delivery of capital programme environmental benefits against original ambitions

The Environment Agency has scaled back the environmental benefits it expects to achieve from the capital programme



**Note**

1 Based on Environment Agency July 2023 forecasts.

Source: National Audit Office analysis of Environment Agency data

Geographical distribution of investment

**2.8** There are considerable variations between regions in the amount of investment compared with the level of risk. We highlighted this in our 2020 report, and the disparity between regions has increased since then (**Figure 7**). Average capital expenditure per property at risk in the North-East of England is £12,563, four times that in the East and West Midlands. The North-East and the North-West had the highest levels of spend per property at risk in the 2015–2021 programme and this remains the case for the 2021–2027 capital programme.

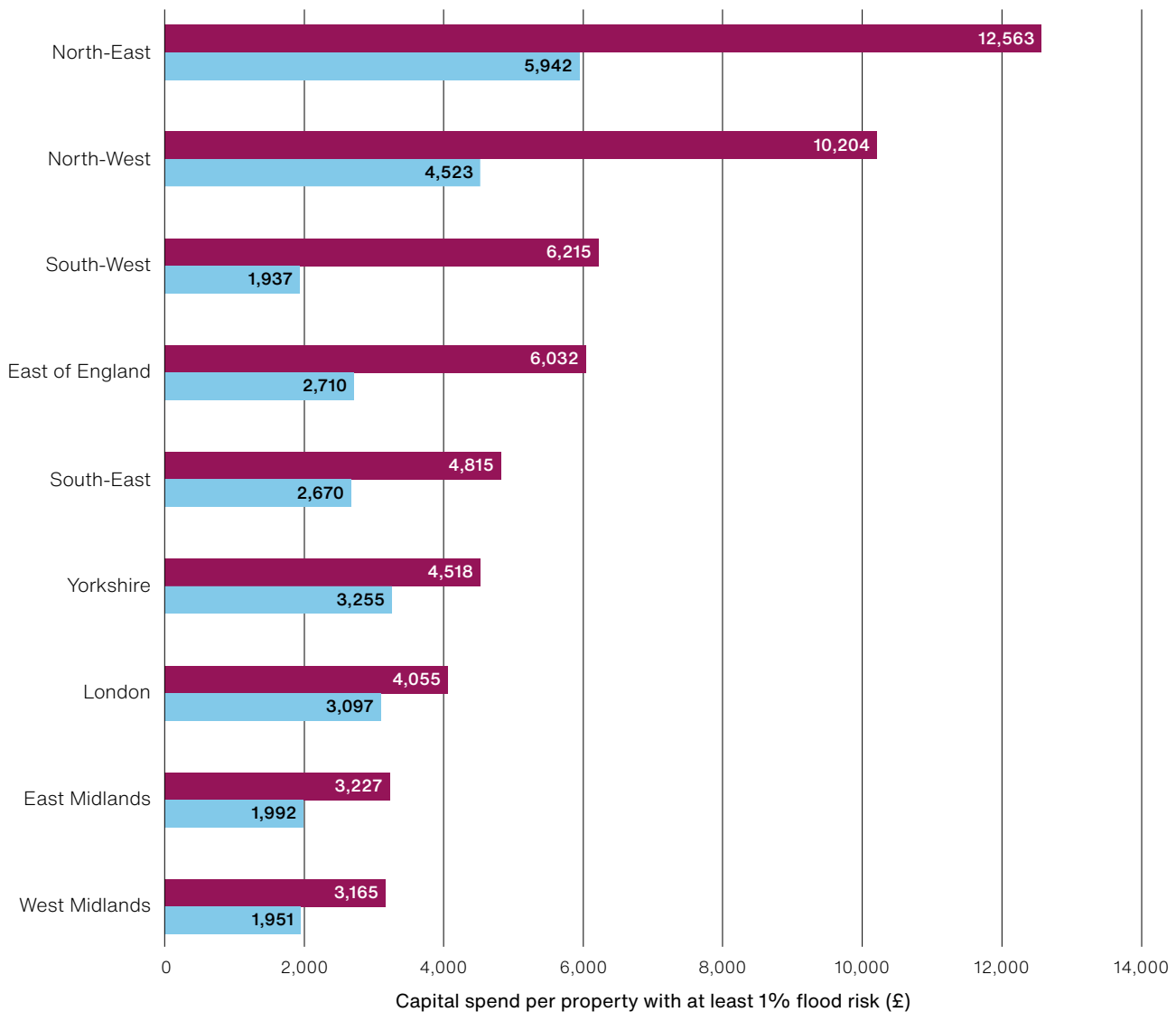
**2.9** Defra told us at the time of our last report that the level of investment in an area depends on the number of feasible projects available and their benefits as well as where flood risk is greatest. Our concern, however, is that some parts of the country may be losing out on funding for other reasons, for example because they are less able to secure partnership funding.



**Figure 7**

Comparison of average capital expenditure on flood defences per property with an annual likelihood of flooding of at least 1%, between the 2015–2021 and 2021–2027 programmes, by region

**Average capital spend in the 2021–2027 programme is almost four times greater in the North-East of England than that in the East and West Midlands**



■ 2021–2027 Programme

■ 2015–2021 Programme

**Notes**

1 Analysis is based on properties at risk data that exclude those at risk from surface water flooding.

2 Analysis is based on forecast capital expenditure for the 2021–2027 programme.

Source: National Audit Office analysis of Environment Agency data provided in August 2023

**2.10** In its February 2021 report on managing flood risk, the Public Accounts Committee (PAC) recommended that Defra and EA should undertake and publish annual analysis of investment levels across regions and deprived areas and follow this with appropriate action to reduce any funding inequality. EA reports on the amount invested and properties better protected by region and investment in deprived areas in its annual management report. However, its analysis does not take account of the level of need in an area or propose any actions to mitigate potential funding inequalities. Defra told us it is concluding analysis to understand the key drivers of these regional investment disparities. Defra is using some of the capital programme funding to mitigate the risk that flood schemes do not progress due to difficulties in securing partnership funding. This includes allocating £100 million out of the £5.2 billion capital programme for a frequently flooded allowance to protect areas which have been affected by repeated flooding.

**2.11** A 2020 report by EA found that people from more deprived areas faced greater flood risk than those living in less deprived areas.<sup>11</sup> The government's approach to selecting projects is designed to ensure deprived areas do not miss out on funding by making projects in deprived areas eligible for more capital funding than those elsewhere. The proportion of all homes better protected that were in the 20% most deprived areas of England declined from 29% of total investment in 2014 to just 8% in 2019. EA now reports on investment in deprived areas and its reporting indicates a more positive position: 21% of properties better protected in the first two years of the capital programme were in these most deprived areas.

**2.12** In response to another PAC recommendation, Defra undertook to identify areas where there is likely to be a shortfall in local authority resources and private sector contributions to ensure effective management of flood risk in local areas. PAC asked Defra to report its assessment by July 2021, but Defra does not now expect to conclude this work until winter 2023-2024. Defra told us that this was due, in part, to local government funding policy and settlements having changed over the past two years and its analysis having to take this into account.

11 Environment Agency, *Social deprivation and the likelihood of flooding*, April 2022.

## Why the capital programme is under-delivering

### Capital programme policy and rules

**2.13** In the capital programme, 82% of projects are under £3 million, the same proportion as in the 2015–2021 programme. However, these smaller projects now make up a larger proportion of total expenditure, increasing from 10% in 2015–2021 to 15% in 2021–2027, and contribute a higher proportion of properties better protected, increasing from 30% to 43% (**Figure 8**).

### Figure 8

#### Comparison between the 2015–2021 and 2021–2027 capital programmes

**The total number of projects under £3 million has increased significantly in the 2021–2027 capital programme**

	Capital programme 2015–2021	Capital programme 2021–2027
Total grant-in-aid investment	£2.6 billion	£5.2 billion
Average cost per project	£4.0 million	£3.8 million
Total number of projects	851	2,569
Total number of projects under £3 million	648	2,107
Proportion of projects under £3 million	82%	82%
Proportion of projects that are led by risk management authorities other than the Environment Agency	64%	55%
Proportion of homes/properties better protected from projects under £3 million	30%	43%
Proportion of total capital programme expenditure from projects under £3 million	10%	15%

#### Notes

- 1 For the 2015–2021 programme, the calculations do not include 65 projects where expenditure data were not available.
- 2 Expenditure calculations include total expenditure for all years of the project including grant-in-aid funding and partnership funding.
- 3 For the 2021–2027 programme, all projects had expenditure data; information is based on the original plans before reprofiling.

Source: National Audit Office analysis of Environment Agency capital programme data

**2.14** The policy and rules that govern the capital programme have remained largely unchanged from the previous capital programme. In 2021, changes were made to Defra's funding rules and EA's processes for the capital programme in anticipation of the new capital programme, including changes in support of surface water projects, which tend to be small projects. However, until June 2023, the amount of work required to include projects in the capital programme was not related to the size of the project. For example, the amount of analysis needed to support business cases was the same for small and large projects and was therefore disproportionately burdensome for smaller projects. This is despite the increased importance of smaller projects to the capital programme. It is only now, almost halfway through the second six-year programme, that Defra and EA are considering changes to ensure a more proportionate approach for smaller projects. In its October 2022 review, the Infrastructure and Projects Authority (IPA) concluded that the 'one size fits all' approach to project development and governance across large and small projects was a blocker to delivery of the capital programme, particularly the effort required to secure partnership funding and the time needed to collect evidence of properties moving from one risk level to a lower one.

**2.15** In June 2023, in response to the IPA's findings and recommendations, EA announced changes to simplify the business case development, assurance and approval processes. These include, for example, the introduction of a single stage business case and local assurance and approval for projects below £3 million. Defra and EA are also discussing further changes to improve the way partnership funding works.

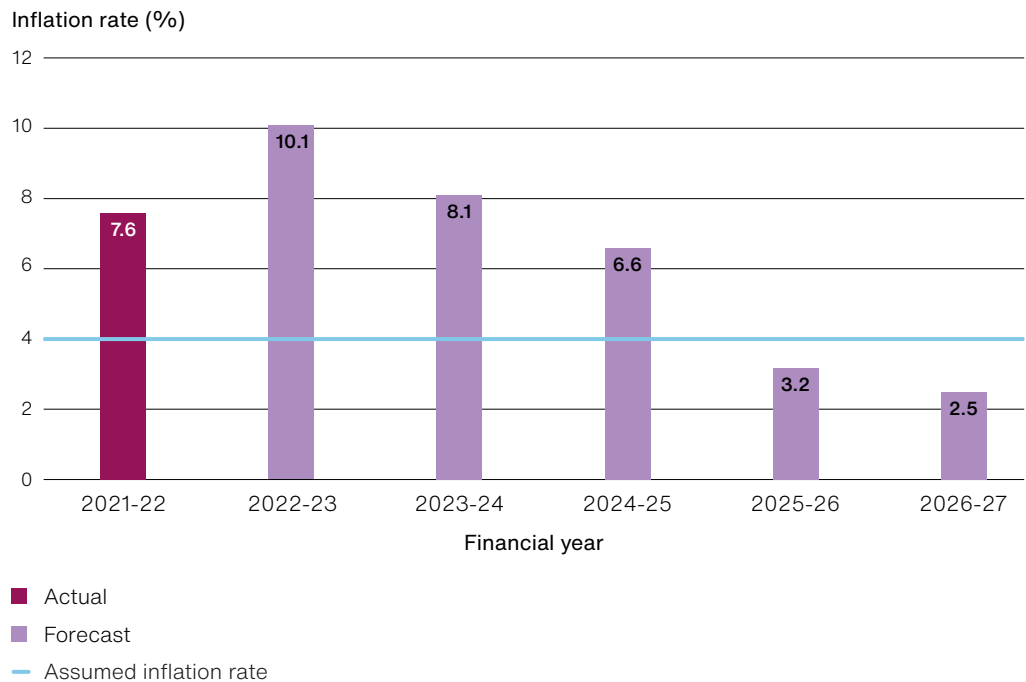
## Inflation

**2.16** Inflation has had a significant impact on the capital programme, affecting the cost and viability of projects. The impact of increasing inflation is one of the top three risks in the capital programme's risk register. EA's original assumption for inflation across the six years of the capital programme (4% a year) was significantly below EA's current flood-specific inflation forecast of an average of 6.3% a year (**Figure 9**). Inflation has different impacts on projects depending, for example, on the mix of construction materials used. EA estimates that inflation is the cause of between a half and two-thirds of the reduction in the forecast number of properties better protected. EA carries out an annual refresh of the capital programme to keep it within budget and this provides the opportunity to remove projects that are no longer affordable due to inflation.

**Figure 9**

Comparison of assumed and actual rates of inflation for flood defence projects by the Environment Agency (EA) for the 2021–2027 capital programme

**EA used an inflation rate of 4% for the capital programme based on government guidance at the time**

**Note**

1 Forecast is the Environment Agency's central forecast.

Source: National Audit Office analysis of Environment Agency data

## Skills and capacity

**2.17** EA and other risk management authorities, particularly local authorities, have struggled to recruit and retain sufficient staff with the necessary skills to deliver the capital and maintenance programmes.

### EA capacity

**2.18** EA has not been able to recruit to fill the increased staff requirement of the larger capital programme. It is still not at full complement almost half-way through the programme. EA's vacancy level peaked in April 2022 with 645 full-time equivalent (FTE) vacancies across EA's floods function, a vacancy rate of 13%. EA has made good progress in reducing vacancies since then with an increased focus on recruitment to posts within EA while using its private sector supply chain in the interim. In August 2023, EA had 274 FTE vacancies against a requirement of 5,355, a vacancy rate of 5%. Of these, 117 vacancies relate to delivery of the capital programme, with particular skills shortages in engineering and project delivery specialisms (**Figure 10** overleaf).

**Figure 10**

Environment Agency floods function staff vacancies, October 2017 to August 2023

The Environment Agency has made progress in reducing the number of vacancies since April 2022

Flood function vacancies (full-time equivalent)



**Notes**

- 1 Negative numbers indicate staffing levels above the requirement.
- 2 Staff requirement as at August 2023 was 5,355 full-time equivalent staff.
- 3 The Environment Agency provided twice-yearly data from October 2017 to March 2022, and monthly data thereafter.

Source: National Audit Office analysis of Environment Agency data

**2.19** EA cites a number of challenges to recruitment and retention including:

- short-term resource funding settlements, which hinder long-term workforce planning;
- the lack of competitiveness of public sector salaries compared with the private sector;
- a highly competitive external jobs market related to an upturn in the national and international infrastructure market and national skills shortages in certain specialisms; and
- EU Exit making it difficult to access skilled workers from the EU.

**2.20** EA is taking a more strategic organisation-wide approach to recruitment and in 2022 established a new central team to coordinate recruitment.

In June 2023, EA published a new organisation-wide three-year strategic workforce plan (2022–2025). The plan recognises that the current approach to workforce planning has been “tactical and reactive”, with the plan looking to develop a more co-ordinated and future-focused approach.

### **Local authority capacity**

**2.21** Lead local flood authorities (LLFAs) are crucial partners for EA in delivering projects that account for around three-quarters of the 49% of the properties better protected by other risk management authorities. They also have a range of statutory flood risk management responsibilities (see Figure 2).

**2.22** Our survey of LLFAs showed that more than 60% did not think they had the staff capabilities to undertake their role effectively. More than half said they did not have the funding either from local or central government to undertake their role effectively (**Figure 11** overleaf). A report by the Chartered Institution of Water and Environmental Management (CIWEM) on surface water management also found that capacity and skills was a significant issue for local authorities.<sup>12</sup> CIWEM found that funding uncertainty, uncompetitive salaries and high workloads were key issues for staff retention.

### **EA and Defra support for local authorities**

**2.23** EA stated in its 2020 strategy that it will have oversight of skills and capabilities across the flooding and coastal change sector to identify gaps and future needs. In its strategy roadmap to 2026, EA set out a number of actions to address the skills gaps, including promoting best practice in incorporating sustainable drainage systems for new developments and to improve planning skills and capabilities. EA has taken action to support LLFAs and other risk management authorities including streamlining the project business case process and improving access to guidance, tools and training.

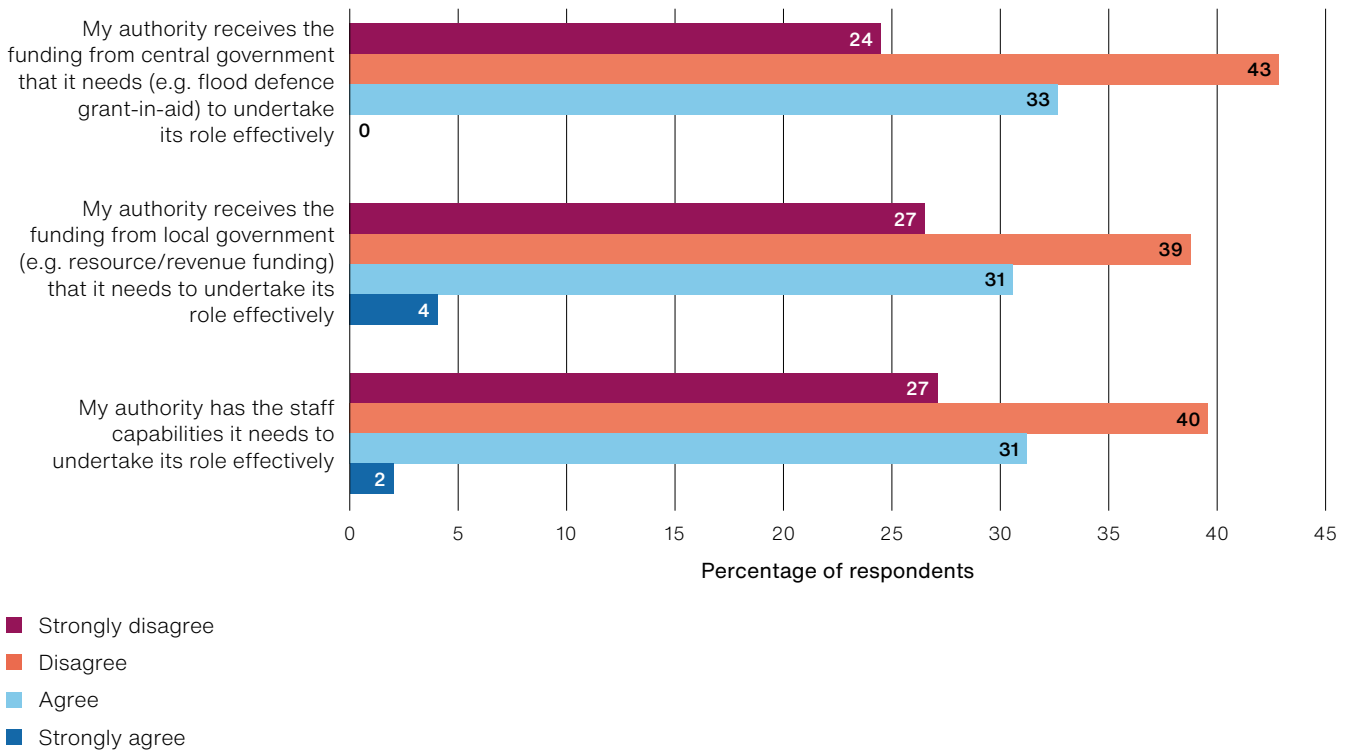
<sup>12</sup> Chartered Institution of Water and Environmental Management, *Surface Water Management: A review of the opportunities and challenges*, May 2023.

**Figure 11**

Views of lead local flood authorities (LLFAs) on resources available, July 2023

**More than half of LLFAs said they did not have the funding or the staff needed to undertake their role**

Survey question



**Notes**

- 1 Survey results based on survey responses from 50 of the 152 lead local flood authorities.
- 2 Survey participants who responded 'Don't know' or gave no response have been excluded.

Source: National Audit Office survey of lead local flood authorities

**Increasing inaccuracy of business case information**

**2.24** Analysis by EA indicates an increasing issue with the accuracy and certainty of information in project business cases and many projects are entering the delivery phase with significant strategic, economic and funding uncertainty. For example:

- important analysis is being deferred until after projects have been approved for the capital programme, leading to reduced project and programme confidence;



- cost forecasts have become less accurate over time: projects were half as likely to have accurate forecasts in 2022 compared with 2015 (this includes both under- and over-estimates of costs); the costs of projects reaching construction in recent years have increasingly diverged from estimates made when the projects were initiated; EA found that for some projects costs are so uncertain that they are not possible to forecast, and that projects enter the capital programme knowing that costs will increase significantly; and
- increased cost uncertainty is being accompanied by longer project business case processes, as uncertainties take time to be resolved: since 2015, project development timescales (the time between Strategic Outline Business Case and Full Business Case) have approximately doubled for larger projects (greater than £3 million) and trebled for small projects. EA also told us that the increased complexity of projects is likely to be having an impact on the length of time the business case process is taking.

**2.25** Much of EA's analysis related to the period before higher inflation started to take effect so this was not the main contributory factor. EA is undertaking work to understand the reasons for this increased inaccuracy.

## **Risks to future delivery**

### Partnership funding

**2.26** Most of the individual projects within the capital programme are required to secure additional funding, known as partnership funding, from other sources. The partnership funding rules were developed in 2011. Eligibility for central government funding for an individual project is based on the benefits it produces including providing better protection to properties, roads, rail or utilities infrastructure. If the value of the eligible benefits is less than its costs, projects are required to secure partnership funding to top up the funding. This can be from both public sector sources, such as local councils or central government departments, and private sector sources, such as local businesses or developers. Partnership funding is designed to allow projects to proceed that would not otherwise be financially viable, as projects with fewer benefits can be approved, subject to partnership funding being secured. A project cannot proceed until the necessary partnership funding has been obtained. Defra does not stipulate how much of the partnership funding should come from public sector sources and how much from private sector sources and has not set a target for the level of partnership funding it is seeking from the private sector, either on a project-by-project basis or overall.

**2.27** EA currently estimates that a total of £2.3 billion partnership funding is needed for the capital programme but continuing inflationary pressures are likely to increase this further. This is because most of the burden of inflation falls on to partnership funding as project costs increase but the method for calculating the amount of government funding has remained fixed. This is an increase on the £1.5 billion of partnership funding that was estimated at the start of the capital programme.<sup>13</sup> In July 2023, around £800 million of the £2.3 billion required partnership funding was yet to be secured, of which EA estimates that £450 million is associated with projects to better protect properties by March 2027.

**2.28** Private sector businesses are often major beneficiaries of the capital programme: based on data from 2016, EA estimates that between 27% and 57% of the economic costs of damage due to floods are costs to businesses. Despite this, of the partnership funding secured so far across the capital programme, only 9% (£128 million) is directly from private sector contributions. This is an increase from the £39 million secured during the 2015–2021 capital programme. EA recognises that private sector contributions have been low and is assessing options it can take to increase these contributions.

### Reliance on large projects

**2.29** EA is relying on a few large projects to deliver its target for properties better protected (**Figure 12**): 43 projects are expected to provide better protection to 136,000 properties, around two-thirds of the overall forecast. If any of these projects are delayed beyond the end of the capital programme this would significantly affect the number of properties better protected achieved by the programme.

### Delivery by risk management authorities

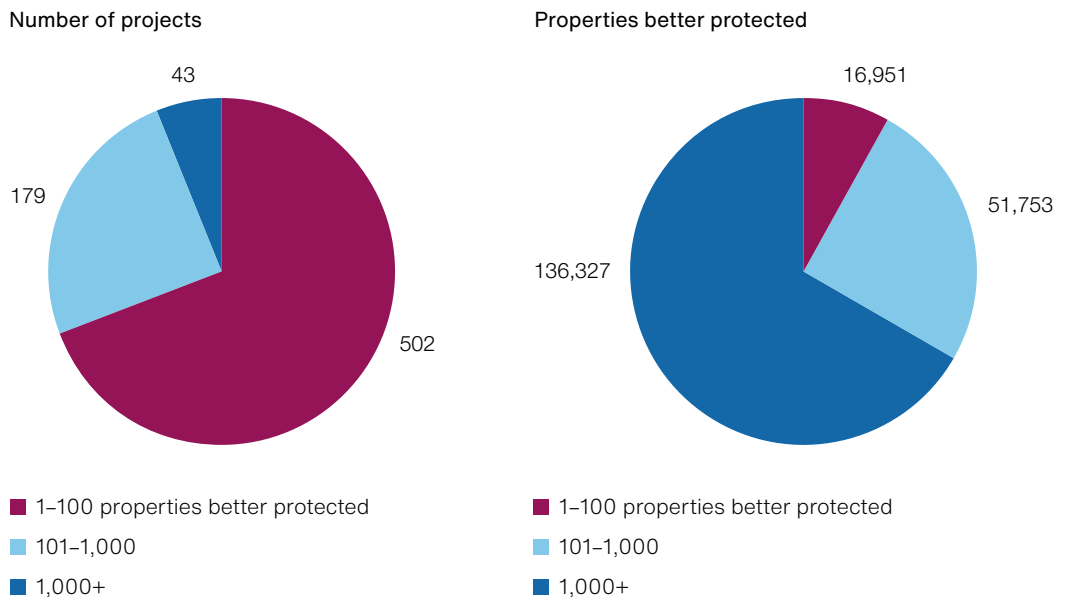
**2.30** Local authorities, internal drainage boards and other risk management authorities (RMAs) have a much more substantial role in delivering the 2021–2027 capital programme than in the previous programme. EA considers these projects to be riskier because delivery is less within its direct control.

<sup>13</sup> This includes partnership funding for some projects that will deliver properties better protected after the end of the capital programme in 2027.

**Figure 12**

Reliance on large projects to deliver better protected properties, 2021–2027

Two-thirds of the properties better protected target (136,327 properties) come from 6% of the projects (43 projects)

**Notes**

- 1 The analysis excludes 776 projects that did not have data for the number of properties better protected. We were unable to establish whether this is due to missing data or because these projects were not expected to deliver any properties better protected.
- 2 The data shown here are based on around 205,000 properties better protected. This differs from data in Figure 5 and Figure 13 due to different data sources used by the Environment Agency.
- 3 Data provided by the Environment Agency in July 2023.

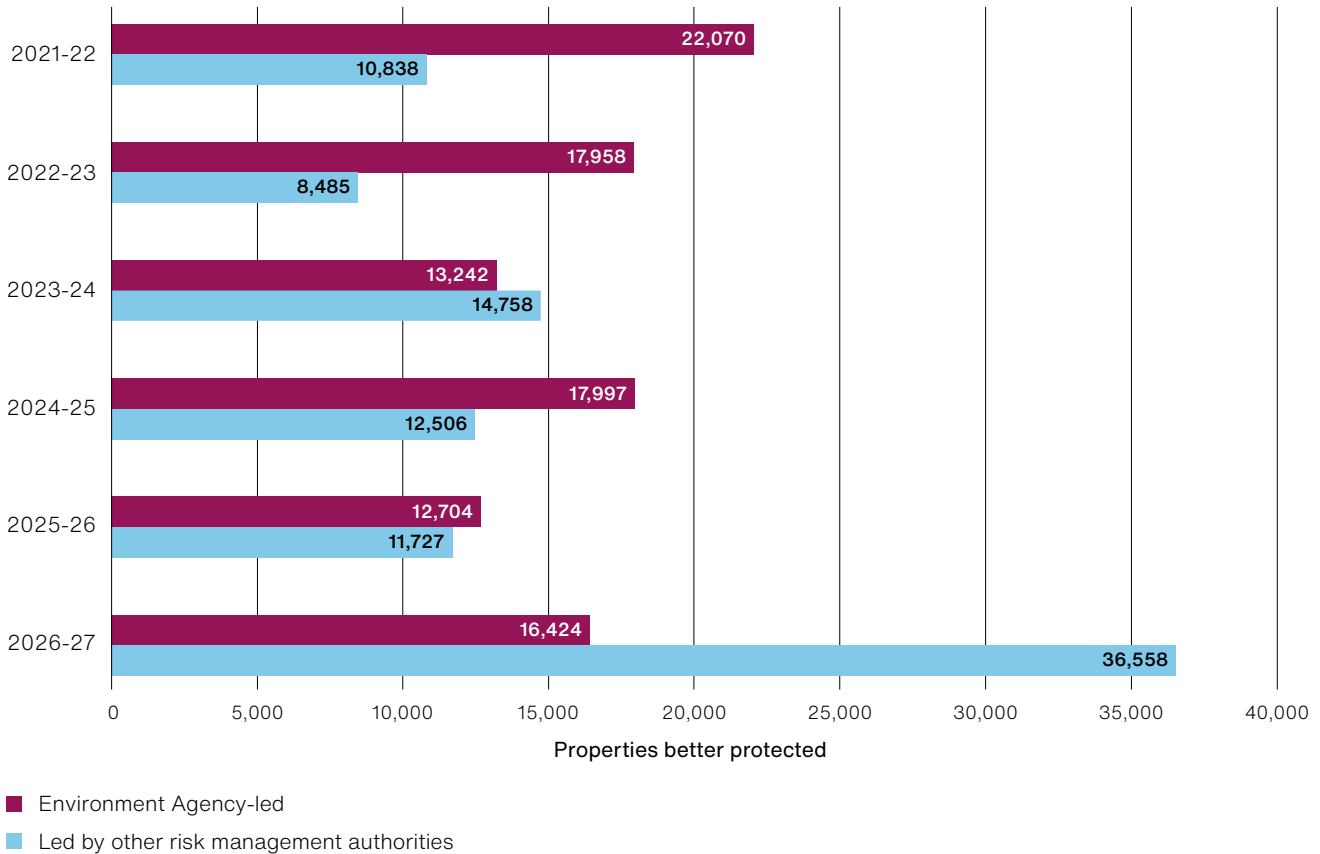
Source: National Audit Office analysis of Environment Agency data

**2.31** As with the previous programme, more than 50% of projects in the capital programme are to be delivered by other RMAs (see Figure 8). However, as the overall size of the capital programme has increased, so too has the number of RMA-led projects. Many of these projects are smaller schemes and surface water flooding prevention schemes. RMA-led schemes are expected to contribute 49% of the properties better protected. More of these are in the final year of the six-year capital programme (39%) than for EA-led schemes (16%). Minor delays to these schemes could further reduce the number of properties better protected by the end of the capital programme (**Figure 13** overleaf).

**Figure 13**

Number of properties better protected delivered per year, by delivery body, 2021–2027

**Delivery of projects led by other risk management authorities is more concentrated in the final year of the six-year funding period than Environment Agency-led projects**



**Notes**

- 1 The data shown here are based on around 195,000 properties better protected. This differs from data in Figure 5 and Figure 12 due to different data sources used by the Environment Agency.
- 2 Data provided by the Environment Agency in August 2023.

Source: National Audit Office analysis of Environment Agency data

## Accelerating projects

**2.32** Our 2020 report highlighted that rigidly applied funding periods and targets can create risks to value for money when there is pressure to spend money or achieve targets by the end of the period.<sup>14</sup> We saw at the end of the 2015–2021 programme that EA attempted to accelerate some projects, so that the properties better protected it was expected to deliver could be counted against the programme's targets, and this brought considerable risks. The Boston Barrier project in Lincolnshire, for example, was considered essential for meeting the overall homes better protected target for the 2015–2021 capital programme. It was accelerated in a phased way so that the 13,000 properties that were better protected by March 2021 could be counted towards the target. To get to the contract stage sooner, all approvals, consents and assurance on the project were done in parallel and the main design and build contract was awarded before the scope had been finalised. The original contractual completion date was September 2020. In April 2021, it was expected to be finished in July 2022. The scheme is now delayed by more than four years with cost increases approved in February 2023 from £124 million to £184 million, due to a contractual dispute, scope changes and an insufficient allowance for optimism bias. EA told us that some of these cost increases are costs that were not identified earlier because of the speed at which the business cases were developed.

**2.33** While there is no overall policy to accelerate the capital programme, EA has accelerated 19 of its largest 55 projects in the 2021–2027 capital programme. EA told us this was due to external factors such as responding to flood events. Its analysis shows that projects that have been accelerated are more likely to experience overspends. Of the projects that are being accelerated, 68% are forecast to spend more than 25% over the pre-accelerated original budget compared with 28% of those that have not been accelerated.

**2.34** Because of the slow start to the programme (see paragraph 2.4), there was an underspend of £310 million in the first two years of the capital programme. HM Treasury has deferred this funding for use in later years of the capital programme to ensure that Defra is funded to meet the government's commitment to spend £5.2 billion on flood defences. As a result of this and with investment already at record levels, EA will need to spend an average of almost £1 billion each year over the remaining four years of the programme.

<sup>14</sup> Comptroller and Auditor General, *Managing flood risk*, Session 2019–2021, HC 962, National Audit Office, November 2020.

## Part Three

### Maintaining flood defence assets

**3.1** Operating and maintaining flood defence assets is critical to reducing the frequency of flooding, and reducing the impact of flooding when it does occur. The investment in operation and maintenance ensures that these assets operate when needed, extends the life of assets and reduces asset deterioration.

**3.2** According to the Environment Agency (EA), there are 263,000 assets in England whose primary purpose is reducing flood risk. They include walls, embankments, channels and culverts, pumping stations, flood gates, weirs and tidal barriers. EA operates and maintains 96,000 flood defence assets.<sup>15</sup> In addition, EA oversees a further 167,000 flood defences which are maintained by third parties such as other risk management authorities (for example, local authorities and internal drainage boards) and landowners. While EA does not maintain these assets, it does inspect third-party assets and can allocate capital funding to replace or upgrade assets, and also provides advice to encourage third-party owners to help them maintain their flood defence assets. However, EA cannot always enforce remedial works on assets owned by third parties. When it is clearly in the public interest, and the flood risk reduction benefits justify the cost, EA can repair or replace third-party assets itself, although only on main rivers and the sea.

**3.3** EA achieved ISO55001 (International Standard for Asset Management) accreditation in 2018. It developed a new asset management strategy for 2023–2033 and its vision is to “have integrated asset management delivering safe, reliable and sustainable assets supporting a healthy natural environment and climate-resilient communities”.

**3.4** In this part, we assess how well EA is performing its maintenance role.

#### **Current asset condition**

**3.5** EA inspects around 175,000 flood defence assets in total and expects to complete around 107,000 inspections in 2023–24. It assigns a target condition to each asset and determines the actual condition through visual inspections. Of the total assets inspected, around 90,000 are used to feed into EA’s key performance indicators on asset condition.

<sup>15</sup> The figure of 96,000 includes asset types such as: natural high ground, engineered high ground, dunes, and EA maintained embankments. Only a subset of these assets are classed as EA assets in line with the accounting framework and included in the depreciated replacement cost (DRC) asset valuation shown in EA’s annual report and accounts.

**3.6 Figure 14** overleaf shows the key performance indicator for the condition of EA assets in high consequence systems. EA divides flood defence assets into high, medium and low consequence asset systems depending on the number of properties they work together to protect: high consequence systems are those with a high concentration of properties. EA has assessed that optimal value for money is achieved when 98% of its high consequence assets are maintained at their required condition and this would require additional investment. This is the point at which the number of assets below condition is minimised at the lowest long-term total costs (capital and resource). EA has assessed that a 100% target is not realistic or good value for money as it takes time to carry out repairs, for example it can take more than three years for major repairs, and accelerating maintenance work has cost implications. EA has not met this 98% level over the past five years and its performance has been slowly declining over this period. This is replicated for EA assets in medium and low consequence systems and also for third-party assets.

**3.7** In its annual report for 2021-22, EA cited the repeated flooding incidents since 2019 and resource funding below what was required to cope with climate change and ageing assets as the main reasons for the declining performance.<sup>16</sup> Following the 2021 Spending Review and the Department for Environment, Food & Rural Affairs (Defra) business planning, funding for asset maintenance, within EA's overall resource settlement, was lower than EA estimated it would need to maintain 98% of its high consequence assets at the required condition. As a result, EA agreed with Defra that only 94%–95% of its high consequence assets would be maintained at the required condition from 2022, because it considered that this was the most it could realistically achieve with the funding available. Its assessment of the optimal level of value for money remains unchanged at 98%. In summer 2023, only 93.5% of EA's assets in high consequence systems were being maintained at the required condition (Figure 14).

**3.8** EA's costs for operating and maintaining flood assets are increasing substantially as the number of assets increases, older assets reach the end of their design life and climate change and more frequent serious flood events cause more damage. Inflation is further adding to EA's costs.

**3.9** To inform its 2021 Spending Review submission, EA estimated the funding needed to maintain 98% of its high consequence assets at their required condition, which would minimise total expenditure in the longer term, was £235 million a year. This level of spending would provide annual benefits of £2.8 billion (estimated reduction in annual average costs of flood damage to residential properties) and an average benefit-cost ratio of 11:1. Defra submitted a bid of £221 million annually for three years between 2022-23 and 2024-25 to HM Treasury. EA estimated that this would allow 96% of assets in high consequence systems to be maintained at the required condition.

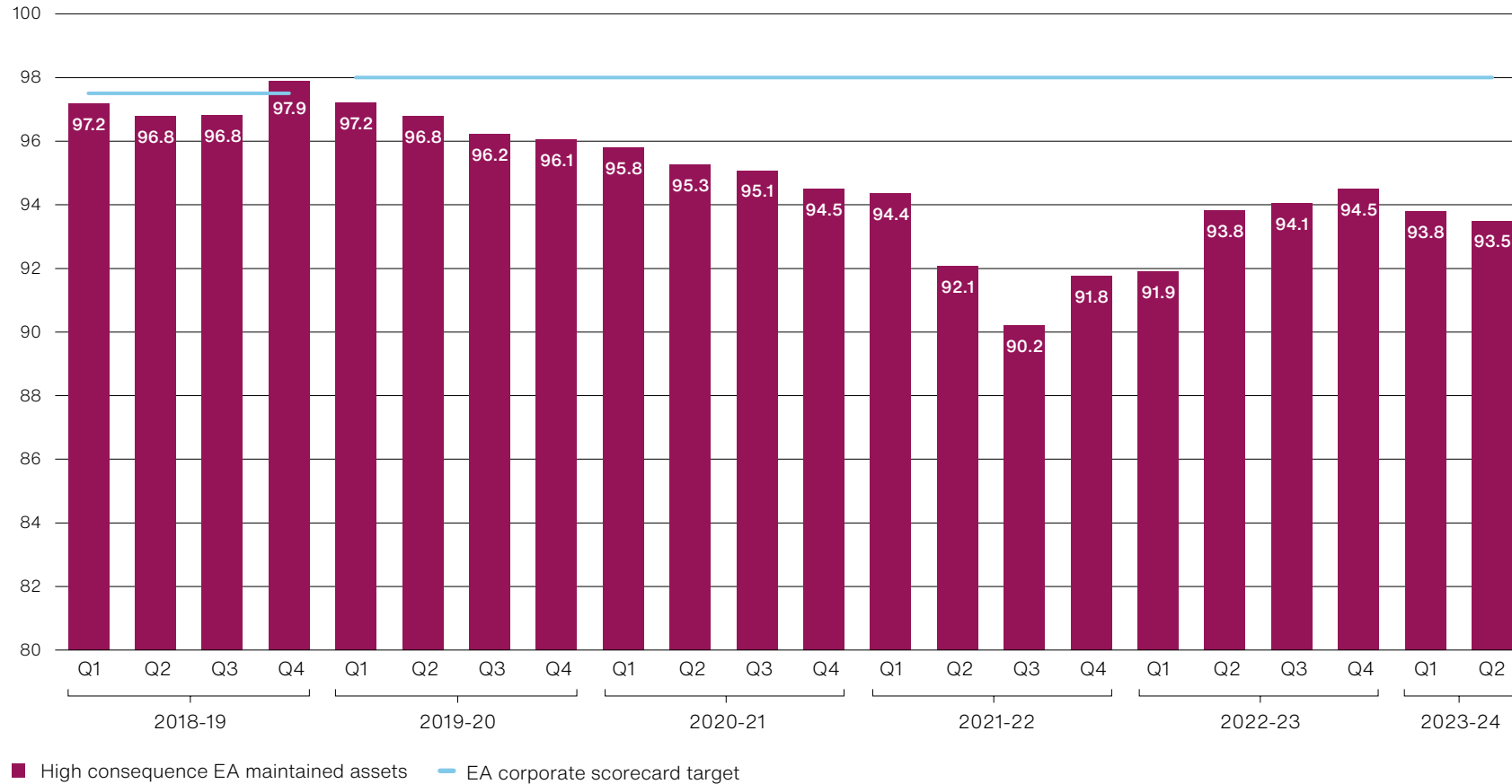
<sup>16</sup> Environment Agency, *Annual report and accounts for the financial year 2021 to 2022*, HC 749, October 2022.

**Figure 14**

Condition of Environment Agency (EA) maintained flood defence assets in high consequence systems, 2018 to 2023

The condition of EA assets has been deteriorating since 2018

Flood defence assets in required condition (%)



**Notes**

- 1 The 98% target level is a key performance measure reported in EA's annual report and accounts. Following the 2021 Spending Review, EA agreed with the Department for Environment, Food & Rural Affairs (Defra) that only 94%–95% of its high consequence assets would be maintained at the required condition from 2022.
- 2 EA divides flood defence assets into high, medium and low consequence asset systems across England depending on the number of properties they work together to protect (high consequence systems are those that protect a high number of properties).
- 3 According to the EA's annual report and accounts 2021-22, there were data quality issues due to the implementation of a new asset information management system. EA believes the figures for that year were likely to be around 94%.

Source: National Audit Office analysis of Environment Agency data



**3.10** Defra and HM Treasury ministers agreed a total resource settlement for the years 2022-23 to 2024-25. This was part of the overall non-ringfenced resource budget for Defra to manage through business planning. Following Defra's 2022-23 business planning, it set EA an overall floods resource budget of £300 million a year for that period, including nominal allowances of £201 million for 2022-23 (£34 million below the £235 million EA assesses as optimal) and £196 million for 2023-24 for maintenance. The allowance for 2022-23 represented a £22 million (12%) increase from the previous settlement of £179 million for 2021-22 and a £28 million (16%) increase compared to 2020-21. EA considered this would allow 94%–95% of assets in high consequence systems to be maintained at the required condition and this was agreed with Defra. Defra has provided EA with an indicative resource budget for its floods work in 2024-25 and EA told us it is currently working to the assumption of £190 million funding for maintenance in 2024-25. In addition to the annual settlements, the government provided additional funding of £120 million for 2020-21 to repair assets damaged in the autumn and winter floods of 2019 and 2020. There is no partnership funding mechanism for either EA's or risk management authorities' maintenance costs.

**3.11** Our 2020 report highlighted the importance of having greater certainty over resource funding to enable longer-term planning, and Defra and EA told us that short-term resource funding settlements continue to present a challenge, for example introducing uncertainty to recruitment.<sup>17</sup> EA also highlighted that more flexibility to switch some funding from capital to resource would be helpful, particularly when capital spending is delayed. HM Treasury confirmed to us that there is potential to do this on a limited basis with decisions based on the value-for-money case for doing so. However, making the case and getting HM Treasury's approval for this are likely to take time. HM Treasury has deferred the £310 million underspend in the first two years of the capital programme to later years of the capital programme (paragraph 2.34). Defra considered that this represents value for money because of the positive benefit-cost ratio of the capital programme as a whole. However, Defra and EA did not assess whether using part of this underspend to meet the shortfall in its maintenance budget in 2022-23 would provide better value for money and did not ask HM Treasury for this flexibility. Defra has provisionally agreed with HM Treasury to switch £25 million from the capital programme to fund maintenance in 2023-24 and Defra is discussing with EA the extent to which this can increase the percentage of its high consequence assets at required condition.

<sup>17</sup> Comptroller and Auditor General, *Managing flood risk*, Session 2019–2021, HC 962, National Audit Office, November 2020.

**3.12** In addition to assets that are maintained by EA, there are 167,000 flood defence assets that are maintained by third parties. Of these, local authorities maintain around 7% of these assets. We heard from local authorities as well as from the Local Government Association (LGA) and the Association of Directors of Environment, Economy, Planning and Transport (ADEPT) about concerns over the lack of resource funding to maintain assets and that local authorities receive no central government ringfenced funding for asset maintenance.

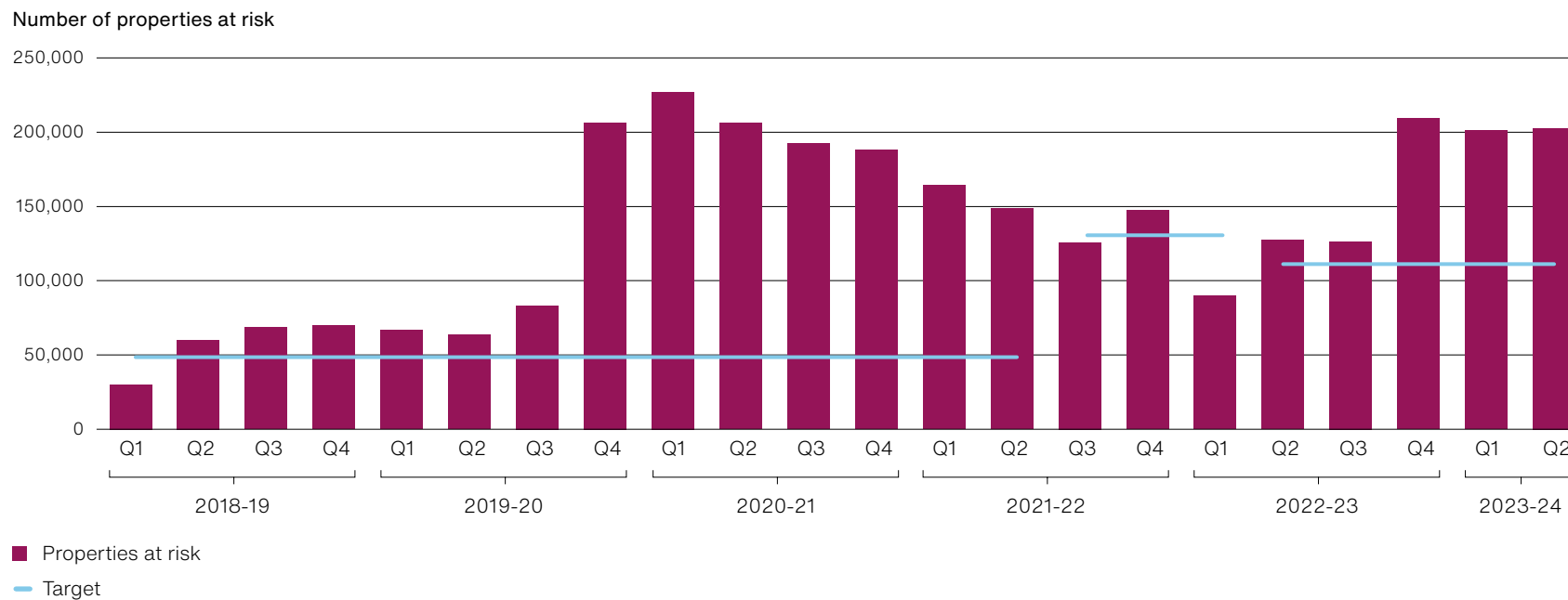
**3.13** The consequence of assets not being at their required condition is that some properties become at higher risk from flooding. EA emphasised that an asset below required condition does not necessarily mean it has structurally failed, or that its performance in a flood is compromised, rather that the probability that it will not perform as designed is increased. Assets that EA has been unable to fully inspect may be classed as below required condition, pending completion of the inspection. EA told us that assets at serious risk of failure are identified as part of the inspection process and dealt with immediately through temporary mitigation measures followed with prioritised permanent works.

**3.14 Figure 15** shows the number of properties at increased risk due to EA assets being below required condition. It shows that for almost all quarters since 2018-19, EA has missed its properties at risk target, even though it has been increased in conjunction with the reduced target for asset condition discussed above. In summer 2023, 203,000 properties were at increased risk as a result of more EA assets being below required condition. This exceeds the 200,000 properties better protected through the capital programme. These figures are not directly comparable: new flood defences provide benefits over a long time period whereas benefits from annual maintenance spending may be shorter term, and the reductions in the scale of risk resulting from maintenance may not be equivalent to the increased protection provided by new flood defences. However, taken together, the two figures suggest there may be a case for switching funding from the capital programme into maintenance to manage overall flood risk when capital spending is delayed. EA estimates that, in summer 2023, a further 50,000 properties were at increased risk from flooding due to third-party assets being below required condition.

**Figure 15**

Number of properties at increased risk of flooding due to Environment Agency (EA) assets being below required condition

**In Quarter 2 of 2023-24, more than 200,000 properties were at risk due to EA assets being below required condition**



**Note**

1 The target levels shown are EA internal operational targets and not reported externally.

Source: National Audit Office analysis of Environment Agency asset performance information

# Appendix One

## Our audit approach

### **Our scope**

**1** We last reported on government's management of flood risk in November 2020. This report is an examination of the government's overall approach to managing the risks of flood and coastal erosion in England, including a review of the 2021–2027 capital and maintenance programmes.

**2** While this report considers the effectiveness of the overall delivery landscape for floods and coastal erosion, we did not audit local authorities or other risk management authorities. We did however elicit their views through a variety of methods that are set out below.

### **Our evidence base**

**3** Evidence collection and analysis for this work were carried out between December 2022 and September 2023.

### Interviews

**4** Between December 2022 and August 2023, we conducted 44 interviews with organisations including the Department for Environment, Food & Rural Affairs (Defra), the Environment Agency (EA), the Department for Levelling Up, Housing & Communities (DLUHC), the Climate Change Committee, the National Infrastructure Commission and the National Farmers Union. These organisations were selected due to their close connection with the funding, delivery and management of flood projects and their policy development remit. In addition, we undertook an online focus group with six lead local flood authorities (LLFAs).

**5** The main topics covered in interviews were Defra's and the government's oversight, risks, progress and funding. Analysis of these interviews was conducted by collating interview notes, identifying key findings and assessing these against the key study themes.

## Document review

**6** Document review took place throughout the study period and included documents such as board papers, workforce plans, risk management strategies, annual reports and accounts, risk assessments, delivery roadmaps, academic research papers and project progress reports.

## Site visit

**7** We undertook a site visit to the Sandwich Town Tidal Defence Scheme to observe the completed project and to discuss relevant issues with key staff from EA and local authorities who were involved in the development and completion of the project. The project was completed in 2015. The visit was undertaken on 7 July 2023.

## Surveys

**8** We carried out a survey of LLFAs. Its purpose was to understand issues affecting LLFAs in addressing flood risk in their local areas. The survey was targeted to flood risk managers, or comparable postholders and recruitment was undertaken with the assistance of the Association of Directors of Environment, Economy, Planning and Transport (ADEPT). The survey was designed to capture a range of views on flood risk and help us identify possible areas of interest, although it did not aim to be statistically representative. The survey was carried out online by the National Audit Office in July 2023 and received responses from 50 out of the 152 local authorities with a role in managing flooding and coastal erosion in England (a response rate of 33%).

## Quantitative analysis

**9** We undertook quantitative analysis, looking at areas such as the condition of assets, the number of properties protected by capital projects and resources available to EA in terms of staffing and funding. EA and Defra provided data between June and August 2023, including datasets such as publicly available local authority spend data, the distribution and quality of flood defence assets and EA staffing information. The data have been used in a number of ways throughout the report including demonstrating how factors such as funding have changed over time and allowing comparisons between the current and previous capital programmes.

### Data limitations

**10** In conducting our work, we found that Defra's and EA's data did not always provide a consistent picture of the capital programme. For example, data on the number of properties better protected by the projects in the capital programme ranged from 195,000 to 230,000. EA told us that this was because the programme was under review leading to changes in the data. We encountered similar issues with the data EA provided on partnership funding.

**11** The data presented are our best understanding of the current situation. Where we have been unable to reconcile data or explain variances, we have made this clear throughout.

This report has been printed on Pro Digital Silk and contains material sourced from responsibly managed and sustainable forests certified in accordance with the FSC (Forest Stewardship Council).

The wood pulp is totally recyclable and acid-free. Our printers also have full ISO 14001 environmental accreditation, which ensures that they have effective procedures in place to manage waste and practices that may affect the environment.



National Audit Office

Design and Production by NAO Communications Team  
DP Ref: 012416-001

£10.00

ISBN: 978-1-78604-516-4