

Historic Environment and Climate Change in Wales

Sector Adaptation Plan Actions and Activities
Evidence Gathering 2022



Historic Environment Group

Climate Change Subgroup

January 2023

Overview



The former Deputy Minister for Culture, Sport and Tourism, Lord Elis-Thomas on 18 February 2020 at the launch of the Historic Environment and Climate Change in Wales Sector Adaptation Plan.

In February 2020, the Historic Environment Group (HEG) published the Historic Environment and Climate Change in Wales Sector Adaptation Plan (SAP) (available [here](#)) to help raise awareness of the risks and opportunities of climate change for the historic environment of Wales and the need for adaptation. In Section 6 of the SAP there are a series of headline actions with intended outputs and outcomes for the historic environment.

The main objective of the SAP is to encourage collaboration and action. We are now at the Year 3 'interim report of activity' stage of the 5-year Sector Adaptation Plan Monitoring and Evaluation Framework cycle (available [here](#)). This involves collecting evidence of adaptation activity that is relevant to the historic environment and was undertaken during 2022 to help us evaluate our progress against the published actions, and to identify gaps and priority areas that require further attention.

The evidence collected will help us to prepare a report in Spring 2023 for Welsh Government, HEG and the Historic Environment Sector. We hope the report will encourage further collaboration.

Interim Reports of Activity for 2020 and 2021 are available here. <https://cadw.gov.wales/advice-support/climate-change/adapting-to-climate-change>

How you can help

The table below sets out the headline actions published in Section 6 of the SAP with their intended outputs and outcomes for the historic environment. Each action has a reference number and there are 22 in total. The activity column of the table gives examples of current known work and activity to meet each action, as collated during the 2021 evidence gathering.

We would like you to share with us examples of further activity relevant to the actions that you are involved in or know about, undertaken in 2022. This may be several entries or just one or two. It can also be used as an opportunity to update progress on existing entries. If you did not submit activities for 2020 or 2021 and would like to, there is also an opportunity to.

We are also keen to hear from you if you do not have relevant activities to report, is there a reason for this? Do you think the historic environment sector could be doing more? Do you feel there are any barriers preventing the delivery of actions in the Headline Action Table?

You can submit your views and an example or examples of activity here:

<https://survey123.arcgis.com/share/0fedc895e38c4096b8eb6b9a731ad6a4>

Submissions are welcomed and encouraged from organisations, community groups, societies and individuals operating in Wales. Please share this request for evidence. **The consultation will close at 14:00 on 10 February 2023.**

Thank you on behalf of the HEG Climate Change Subgroup.

HEG is a high-level forum set up by the Welsh Ministers in 2004 to take a strategic overview of issues and opportunities in the historic environment and to promote common approaches. The HEG Climate Change Subgroup is charged with assessing and reporting to HEG on how the historic environment sector in Wales should address the challenge of climate change.



Actions and activity table

The table below sets out the headline actions needed to adapt to the impacts of climate change on the historic environment of Wales. They are arranged around the three overarching and linked objectives of increasing our knowledge, increasing our capacity and building our resilience, and are grouped under the following seven headings:

1. Knowledge exchange and collaboration
2. Mapping and monitoring
3. Research priorities
4. Dissemination and promotion
5. Collaborative working
6. Training and guidance
7. Taking action

Examples of current known work collected during 2021 evidence gathering are provided in the activity column. Details of any abbreviations and links to resources in the text can be found at the end of the document.

Knowledge: Increase our knowledge and understanding of the threats and opportunities for the historic environment from a changing climate					
	Description of the action	Output(s) from the action	Broad outcome/impact	Activity 2021	CCW Indicator
I. Knowledge exchange/collaboration					
1.1	Dissemination, promotion and stakeholder engagement of the Historic Environment and Climate Change Sector Adaptation Plan. For example: <ul style="list-style-type: none"> • Communication Strategy. • Stakeholder engagement with politicians and senior decision-makers. • Monitor and evaluate strategy. 	<ul style="list-style-type: none"> • Publication of the Historic Environment and Climate Change Sector Adaptation Plan. • Secured resources and practical actions to deliver the plan. 	<ul style="list-style-type: none"> • Raised awareness of the challenges posed by climate change on the historic environment. • Direct action to improve our knowledge, build capacity and increase the resilience of the historic environment to climate change. • Provision of a strategic framework to take forward adaptation actions. 	<ul style="list-style-type: none"> • HEGS – SAP Monitoring and Evaluation Framework published June 2021 (see 4.1, 5.1). • HEGS – SAP Action Plan activity survey for 2020 initiated and closed January 2021. • HEGS – SAP Action Plan activity survey 2020 interim report drafted with new case studies written. To be published Spring 2022. • HEGS – Paper published in an international journal. Barker, L., Bullen, J., Davidson, A., Fairweather J., & Laws, K. (2021): Climate Change and the Historic Environment in Wales. Developing and Delivering a Sector Adaptation Plan, The Historic Environment: Policy & Practice, DOI: 10.1080/17567505.2021.1944574 • HEGS – Work initiated on a Communication Strategy. To be published 2022. (see 5.1-2) • HEGS – Membership grew from 6 to 11 organisations - Cadw, NRW, RCAHMMW, GAT, NT, PCNPA, SNPA, GGAT, DAT, CPAT, AC-NMW. • RCAHMMW – Contribution to delivery of the SAP incorporated into Operation Plan and reported against. • RCAHMMW and partners – CHERISH project. Contribution to delivery of the SAP incorporated into project initiatives and workplan. • RCAHMMW and partners – CHERISH project e-conference May 2021. HEGS invited and SAP was a topic for presentation. Available here. • BBNP – Inclusion of SAP within draft Historic Environment Action Plan. • NLHF – SAP is signposted in the NLHF Environmental Guidance, updated Feb 2021 	<ul style="list-style-type: none"> • HE1
1.2	Establish a knowledge exchange group(s) for researchers and practitioners to share ideas, information and good practice, and to help identify future research and funding opportunities in Wales. For example: <ul style="list-style-type: none"> • Establish a climate and heritage management group. • Establish a spatial mapping group. 	<ul style="list-style-type: none"> • Knowledge exchange group(s) established and active. • Identification of future research priorities for Wales. 	<ul style="list-style-type: none"> • A coordinated approach, maximising knowledge and resources, leading to capacity building and more successful adaptation. 	<ul style="list-style-type: none"> • HEGS, WATs, Cadw – Exchange group initiated, and meetings held to discuss Cadw funded WAT projects. • HEGS – Initiated the establishment of a Peatland Working Group, led by Cadw. • HEGS – agreed to coordinate Climate Change Adaptation theme for the Research framework for the Archaeology of Wales which will identify future research priorities, to be progressed 2022. • SNPA – Welsh Peatlands Sustainable Management Scheme funded full time Research Hub Coordinator (Swansea University) to build research capacity and identify research priorities (see 3.1). <i>Continuation from 2020 activity</i> • SNPA – Participation in ECOTWIN (EU Green Deal) application via Living Wales scheme (assessing climate change impacts on Natura 2000 sites via modelling using remote sensing data). <i>Continuation from 2020 activity.</i> 	<ul style="list-style-type: none"> • HE2 • MC4

1.3	Participation from Wales in established UK and wider climate heritage groups and networks. For example: <ul style="list-style-type: none"> Fit for the Future network. <ul style="list-style-type: none"> Historic Environment Adaptation working group. Climate Heritage Network. 	<ul style="list-style-type: none"> Welsh attendance at climate heritage groups and networks. 	<ul style="list-style-type: none"> Collaborative working maximising knowledge and resources, leading to capacity building and more successful adaptation. 	<ul style="list-style-type: none"> Cadw – Continues to build on its partnership with HES, HE, EH, NT and Communities NI. Completed or on-going activities including COP26 Summit (see 6.1) Hazard Mapping (see 2.1, 3.4)), Risk Profiling and Adaption Manual. Cadw – joined the Climate Heritage Network RCAHMW – continue as members of the Fit for the Future and Climate Heritage Network RCAHMW and partners – CHERISH project participated and liaised with other networks and bodies in relation to climate change and coastal heritage e.g., SCAPE, CITiZAN, FPAN. Events in 2021 included a range of events and films for COP26 e.g. #ClimateHeritage Stories. CHERISH work was also featured in a Channel 4 News special report and ITV Wales Coast and Country. 	<ul style="list-style-type: none"> HE2 MC4
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	Description of the action	Output(s) from the action	Broad outcome/impact	Activity 2021	CCW Indicator
2. Mapping and monitoring of the resource					
2.1	Improving baseline data. Develop standardised methodologies and assessment tools to both identify historic assets and prioritise those at risk. For example: <ul style="list-style-type: none"> Wales spatial mapping work including environment/asset specific mapping and analysis. Data enhancement programmes. Use of soil moisture indexes to target aerial reconnaissance during dry periods. 	<ul style="list-style-type: none"> Improved baseline data sets. Improved consistency and comparability of data. Publicly available and regularly updated central repository of spatial mapping datasets. 	<ul style="list-style-type: none"> Improved understanding of the threats and opportunities for the historic environment from a changing climate. Improved evidence base for monitoring, statutory protection, decision-making and adaptation strategies. 	<ul style="list-style-type: none"> RCAHMW – Ensuring that the maritime and coastal elements of the national monuments record are up to date and continuing to be enhanced. RCAHMW – Met Office soil moisture indexes purchased annually for targeted aerial reconnaissance programme. Cadw – Continues to build on its partnership with HES, HE, EH, NT and DoC (NI). Completed or on-going activities including Hazard Mapping (see 2.1, 3.4), Risk Profiling and Adaption Manual.(see 1.3) DAT, GAT, CPAT – Initiation of Cadw funded rivers and riparian environments -historic environment record enhancement project. GGAT – Coastline data historic environment record enhancement and GIS project covering area between Wye and Usk rivers to assist management recommendations going forward. SU, YU – Research publication with case study Dysynni Valley, Gwynedd: by Isabel Cook, Robert Johnston & Katherine Selby (2021) Climate Change and Cultural Heritage: A Landscape Vulnerability Framework, The Journal of Island and Coastal Archaeology, 16:2-4, 553-571, DOI: 10.1080/15564894.2019.1605430 (see 2.2, 6.3, 7.2) RCAHMW and partners – CHERISH project continues. Targeting specific study areas in coast zone (includes seabed, intertidal, island and coast edge environments) to improve baseline data through technologies such as lidar, UAVs, GNSS, terrestrial laser scanning, marine survey for baseline and condition/change monitoring of coast zone. Includes data enhancement and archiving of freely available data and event reporting of project work to NMRW as central repository of data. (see 2.2, 3.1-2, 6.3, 7.3-4) SNPA – Carbon Scrutiny group has been established to evaluate strategic policies. Alongside other Welsh NPs a system for establishing Carbon emission baselines is being implemented and a Carbon Strategy is planned. SNPA – Started a new project to manage and enhance Snowdonia’s 14 Conservation Areas. The project will ensure sustainable conservation can enhance Conservation Areas to the future (see 2.2, 7.2). SNPA – Carneddau Landscape Partnership Scheme continues. Using innovative methods to map, monitor and reveal historic environment assets e.g., LiDAR and Lost farmsteads Project (see 2.2, 3.1-3, 6.2, 7.1-5). NT – Visitor and Climate Change report, summary published on NT website 2021 (see 3.4, 6.3). 	<ul style="list-style-type: none"> HE2 MC4
2.2	Establish and implement targeted monitoring regimes on identified historic assets. For example: <ul style="list-style-type: none"> Develop and publish case studies to outline different monitoring approaches to ensure consistency of data and approach. Establish online/mobile application to record incidents/ impacts e.g. of pests and disease. 	<ul style="list-style-type: none"> Targeted monitoring programme and condition data. Best-practice guidance document/technical notes for monitoring assets at risk drawing on case studies. 	<ul style="list-style-type: none"> Improved understanding of the threats for the historic environment from a changing climate. Provision of data for historic assets to assist the development of management strategies and prioritisation. 	<ul style="list-style-type: none"> PCNPA – Continues to monitor the condition of scheduled monuments within the National Park using volunteers (system set up in 2020). (see 3.1-2, 7.4) PCNPA – Continuation of Changing Coasts project using fixed point photography. Communities/public submit photographs at specific coastal path points to monitor change and erosion (see 3.1-2, 7.3-4). RCAHMW – Inter-tidal zone focussed work. Developing methodologies to allow us to monitor sites (see 7.3). BBNP – Continuation of volunteer condition monitoring programme ongoing (see 3.1-2, 7.4) SU, YU – Research publication with case study Dysynni Valley, Gwynedd: by Isabel Cook, Robert Johnston & Katherine Selby (2021) Climate Change and Cultural Heritage: A Landscape Vulnerability Framework, The Journal of Island and Coastal Archaeology, 16:2-4, 553-571, DOI: 10.1080/15564894.2019.1605430 (see 2.1, 6.3, 7.2) RCAHMW and partners – CHERISH project continues. Repeat monitoring of case-study sites, installation of permeant survey markers (aligned and working with WCMC methodologies) and procedures for comparison of datasets to improve consistency and comparability of data (see also 2.1, 3.1-2, 6.3, 7.3-4). SNPA – Started a new project to manage and enhance Snowdonia’s 14 Conservation Areas. The project will ensure sustainable conservation can enhance Conservation Areas to the future (see 2.1, 7.2). 	<ul style="list-style-type: none"> HE2 MC4

	<ul style="list-style-type: none"> Establish a link to scheduled monuments and listed buildings at risk monitoring work. 			<ul style="list-style-type: none"> SNPA – Carneddau Landscape Partnership Scheme continues. Includes monitoring of assets with volunteers and general public (e.g. fixed point monitoring) (see 2.1, 3.1-3, 6.2, 7.1-5). NT – Framework established to record and monitor mold in historic collections against local and regional environments, and against recorded climate changes as part of the Taking Control of Mold project. 	
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	Description of the action	Output(s) from the action	Broad outcome/impact	Activity 2021	CCW Indicator
3. Research priorities					
3.1	<p>Improve understanding of the interacting and cascading relationships, and cumulative impacts of climate risk factors. For example:</p> <ul style="list-style-type: none"> Building condition, location and socio-economic factors. Changing land use and redundancy of agricultural buildings resulting in a cumulative loss of historic landscape features and changed settings. Increases in invasive species that may impact on historic assets. Acidification of seawater and increase in marine species which pose potential threats to wrecks/timber structures in marine conditions. Measures to address chronic and acute pollution from historic mining. Risks to building fabric from increased humidity, moisture, wind and driving rain, and the knock-on impact on indoor air quality and the health of building occupants. Cumulative impact of successive extreme weather events on historic assets. The frequency, range and potential regional variations of extreme weather events and their impact on the historic environment. 	<ul style="list-style-type: none"> Reports and recommendations. 	<ul style="list-style-type: none"> Adaptive actions take inter-relationships and cumulative impacts into account, thereby minimising the potential for maladaptation, leading to improved management of historic assets and the creation of best-practice guidance. 	<ul style="list-style-type: none"> PCNPA – Monitoring the condition of scheduled monuments within the National Park using volunteers (system set up in 2020). (see 2.2, 7.4, 3.2) PCNPA – Continuation of Changing Coasts project using fixed point photography. Communities/public submit photographs at specific coastal path points to monitor change and erosion (see 2.2, 3.2, 7.3-4).. UWTSD – Michael Norman (MA Student) studying the management of climate change loss in Welsh historic parks and gardens. Cadw – Hosting Welsh Government funded Climate Resilience Embedded Researcher investigating the risks and adaptation of buildings. Findings have helped inform the new WHQS, as well as training standards and emerging guidance (see 6.1-3). Private Company – Specialist supply and consultancy in historic and vernacular buildings, working with the dual challenges of upgrading thermal performance of buildings, whilst not compromising their capacity to deal with climate changes - in particular warmer and wetter futures. BBNP – Continuation of volunteer condition monitoring programme (see 2.2, 3.2, 7.4). RCAHMW and partners – CHERISH project continues. Targeting specific study areas in coast zone (includes seabed, intertidal, island and coast edge environments) to improve baseline data and monitor sites through technologies such as lidar, UAVs, GNSS, terrestrial laser scanning, marine survey for baseline and condition/change monitoring (see 2.1-2, 3.2, 6.3, 7.3-4). SNPA – Life Celtic Rainforests Project leading on methods to tackle invasive species. SNPA – Carneddau Landscape Partnership Scheme continues. Using innovative methods to map, monitor and reveal historic environment assets e.g. 2020 LiDAR and Lost farmsteads Project (see 2.2, 3.2-3, 6.2, 7.1-5). SNPA – Importance of palaeoenvironmental record and ecofacts vulnerable to climate change/conditions. HLF funded Cyfoeth Ein Corsydd and Carneddau Peatland Science project (see 1.2). <i>Continuation from 2020</i> 	<ul style="list-style-type: none"> HE2 MC4
3.2	<p>Research to improve knowledge of past and present climate change impacts on historic assets e.g. decay/erosion/accretion.</p>	<ul style="list-style-type: none"> Research results, case studies and recommendations. 	<ul style="list-style-type: none"> Increased understanding of stages, timescales and outcomes leading to improved management and adaptation interventions to build resilience. 	<ul style="list-style-type: none"> PCNPA – Monitoring the condition of scheduled monuments within the National Park using volunteers (system set up in 2020). (see 2.2, 7.4, 3.1). PCNPA – Continuation of Changing Coasts project using fixed point photography. Communities/public submit photographs at specific coastal path points to monitor change and erosion (see 2.2, 3.1, 7.3-4). BBNP – Continuation of volunteer condition monitoring programme ongoing (see 2.2, 3.1, 7.4). RCAHMW and partners – CHERISH project continues. Includes core sampling and dating (OSL and C14) to providing information on past changing climates and environments, map regression and documentary research highlighting recent impacts (see 2.1-2, 3.1, 6.3, 7.3-4). SNPA – Carneddau Landscape Partnership Scheme continues. Skylines project raises awareness of montane heath, prehistoric cairns and the relationship between climate change, landscape, vegetation and human impact across millennia. 	<ul style="list-style-type: none"> HE2 MC4
3.3	<p>Improve understanding of the positive and negative effects of a longer growing</p>	<ul style="list-style-type: none"> Report and recommendations. 	<ul style="list-style-type: none"> Improved long-term adaptation and maintenance programmes. 	<ul style="list-style-type: none"> SNPA – Carneddau Landscape Partnership Scheme continues. Skylines project strand (see 3.2). 	<ul style="list-style-type: none"> HE2 MC4

	season on the maintenance and management of the historic environment.			<ul style="list-style-type: none"> SNPA – Opportunities to contribute and feed results of Carneddau vegetation management and monument condition monitoring into studies. <i>Continuation from 2020 activity.</i> SNPA – Opportunities for partnership working e.g. our contacts with Henfaes research farm, Bangor Univ., and their medium and long term research on aspects of diverse aspects of land management including climate impacts. <i>Continuation from 2020 activity.</i> 	
3.4	Work with UKCP18 projections to identify opportunities for the historic environment and the economy e.g. planting of woodland and forestry; establishment of new industries relating to adaptation; changing leisure opportunities; increased use of UK coastal resorts.	<ul style="list-style-type: none"> Identification of opportunities. 	<ul style="list-style-type: none"> A combined beneficial response to adaptation will encourage uptake and identification of new opportunities, including tourism investment. 	<ul style="list-style-type: none"> Cadw – Continues to build on its partnership with HES, HE, EH, NT and Communities NI. Completed or on-going activities including Hazard Mapping (see 2.1, 3.4), Risk Profiling and Adaption Manual (see 1.3). SNPA – Facilitating woodland planting by identifying areas of little risk to heritage assets and suitable in relation to historic landscape character. <i>Continuation from 2020 activity.</i> NT – Visitor and Climate Change report, summary published on NT website 2021 (see 2.1, 6.3) 	<ul style="list-style-type: none"> HE2

Capacity: Develop the methodologies, tools and guidance to work with others and build adaptive capacity					
CCW Indicator					
	Description of the action	Output(s) from the action	Broad outcome/impact	Activity 2021	CCW Indicator
4 Dissemination and promotion					
4.1	Creation of a steering group to oversee the delivery of the HEG SAP and to monitor and review progress. The steering group will establish and coordinate working/subgroups as necessary.	<ul style="list-style-type: none"> Steering group formed from representatives within Wales. 	<ul style="list-style-type: none"> The provision of a strategic framework through which the action plan is delivered. 	<ul style="list-style-type: none"> HEGS – SAP Monitoring and Evaluation Framework published June 2021 (see 1.1, 5.1). 	<ul style="list-style-type: none"> HE3
4.2	Creation of a dedicated (full-time equivalent) Climate Change Manager post for the historic environment sector in Wales.	<ul style="list-style-type: none"> Climate Change Manager in post. 	<ul style="list-style-type: none"> Direct action to help steer and guide the delivery of the HEG SAP and to play a central role in raising the profile of the climate change work across the historic environment sector in Wales. 	<ul style="list-style-type: none"> NT – Climate adaptation core programme team initiated 2021, workshops rolling out across NT Jan 2022 onwards. (see 6.1 -2). 	<ul style="list-style-type: none"> HE3

	Description of the action	Output(s) from the action	Broad outcome/impact	Activity 2021	CCW Indicator
5. Collaborative working					
5.1	The steering group to coordinate and encourage stakeholder engagement and promote partnership working to ensure efficient use of resources across sectors.	<ul style="list-style-type: none"> Cross-sector partnerships and coordinated working will ensure resources are targeted effectively and efficiently. 	<ul style="list-style-type: none"> Effective delivery of the HEG SAP actions. Raised awareness of the historic environment across the wider sector which will help prevent secondary damage and maladaptation to the historic environment. Improved cross-sector working. 	<ul style="list-style-type: none"> HEGS –Work initiated on a Communication Strategy. To be published 2022. (see 1.1, 5.2) HEGS – SAP Monitoring and Evaluation Framework published June 2021 (see 1.1, 4.1). RCAHWW and partners – CHERISH project works cross-sector and with a variety of stakeholders and partners. Cadw – Continues to build on its partnership with HES, HE, EH, NT and Communities NI. 	<ul style="list-style-type: none"> HE3
5.2	The steering group/working group to work with officials across Wales to embed the HEG SAP in national and local government policy statements, plans and codes	<ul style="list-style-type: none"> The historic environment will feature in the Welsh Government Climate Change Adaptation Plan for Wales. The HEG SAP considerations will be linked and noted in, for example: <ul style="list-style-type: none"> Shoreline Management Plans. Relevant Planning Policy Wales supplements. 	<ul style="list-style-type: none"> Help prevent secondary damage and maladaptation to the historic environment. 	<ul style="list-style-type: none"> Cadw/WG – the SAP is embedded in the WG adaptation plan, Prosperity for all: A climate conscious Wales. Cadw continues in its role as heritage sector lead in the WG Core Internal Adaptation Group. Activities include reporting progress against the actions in the SAP and WG adaptation plan, and promoting cross-sector engagement and collaborative working across WG policy teams. HEGS – Work initiated on a Communication Strategy. To be published 2022 (see 1.1, 5.1). DAT & GAT contributed to the Shoreline Management Plan (SMP) refresh in 2021– ensuring SAP referenced in SMPs. (see 6.3) 	<ul style="list-style-type: none"> HE3

5.3	Provide, promote and maintain a publicly available case study resource to illustrate climate change risks and impacts affecting the historic environment and examples of adaptation. All should be able to contribute to this resource.	<ul style="list-style-type: none"> Case study resource. 	<ul style="list-style-type: none"> Raised awareness of the challenges posed by climate change and adaptation on the historic environment. Demonstration of a range of practices and evidence of direct action. 	<ul style="list-style-type: none"> HEGS – Case studies resulting from 2020 activity survey written due to be published 2022. RCAHMW and partners – CHERISH project study sites provide case study resources showcased on website, leaflets, through talks, blogs, CHERISH on-line 'chats', the travelling exhibition and films. NT – Climate change adaptation case studies for coast (Dinas Dinlle, Gwynedd) and buildings (Porthdinllaen, Gwynedd) produced. 	<ul style="list-style-type: none"> HE3
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	Description of the action	Output(s) from the action	Broad outcome/impact	Activity 2021	CCW Indicator
6. Training and guidance					
6.1	Identify and support the training of historic environment practitioners specialising in the impacts of climate change and adaptation of the historic environment.	<ul style="list-style-type: none"> Trained climate change historic environment practitioners. 	<ul style="list-style-type: none"> Raising standards to embed climate change considerations in the historic environment. 	<ul style="list-style-type: none"> Cadw – Hosting Welsh Government funded Climate Resilience Embedded Researcher investigating the risks and adaptation of buildings. Findings have helped inform the new WHQS, as well as training standards and emerging guidance (see 3.1, 6.2-3). Cadw – Continues to build on its partnership with HES, HE, EH, NT and Communities NI. Completed or on-going activities including COP26 Summit (see 6.1) Hazard Mapping (see 2.1, 3.4), Risk Profiling and Adaption Manual. (see 1.3). NRW – Delivered an introductory training session on peat and historic environment (including impacts climate change) to Cadw, WATs and NP archaeologists. GGAT – Staff have attended various training events and conferences. RCAHMW – Digital Past online conference 8-12 February 2021. Themes covered 'Digital Heritage, the Environment and Climate Change'. Available here (see 6.2). RCAHMW and partners – CHERISH project's online e-conference on Coastal Cultural Heritage and Climate Change 12 May 2021. Available here (see 6.2). NT – Climate adaptation core programme team initiated 2021, workshops rolling out across NT Jan 2022 onwards. (see 4.2, 6.2). 	<ul style="list-style-type: none"> HE3
6.2	Climate change historic environment practitioners to provide training and support within and across sectors in the impacts of climate change and adaptation of the historic environment. For example: <ul style="list-style-type: none"> Produce an e-learning module on the historic environment and climate change. Organise slots at meetings, training events and workshops with other sectors. 	<ul style="list-style-type: none"> Planners and developers can advise authoritatively through pre-application advice e.g. on the design and implementation of adaptation proposals. Grant officers can ensure changes and adaptation actions are sensitive to the historic environment. Owners can identify and implement management and adaptation opportunities. Community groups established to develop programmes to identify, monitor and record historic assets at risk. 	<ul style="list-style-type: none"> Raised standards to embed climate change considerations in the historic environment. Improved cross-sector working, knowledge and understanding, decision-making and the quality of adaptation actions. 	<ul style="list-style-type: none"> PCNPA and PLANED delivered Archaeology Day 2021 virtually and this included climate change themed content, such as talks about the St Patrick's Chapel and Caerfai Promontory Fort excavations and CHERISH videos. Available here. RCAHMW – Provision of Marine Planning Advice for Marine Development to ensure that coastal/offshore development does not cause further impact on our cultural heritage. (see 6.3). Cadw – Hosting Welsh Government funded Climate Resilience Embedded Researcher investigating the risks and adaptation of buildings. Findings have helped inform the new WHQS, as well as training standards and emerging guidance. Stakeholder dissemination and engagement activities included a cross-sector seminar and two workshops, and presentations to the Climate Resilience Heritage Summit, WG Housing Information Group and various key WG policy teams.. (see 3.1, 6.1, 6.3). Cadw – Continues to build on its partnership with HES, HE, EH, NT and Communities NI. Completed or on-going activities including COP26 Summit (see 6.1) Hazard Mapping (see 2.1, 3.4), Risk Profiling and Adaption Manual.(see 1.3) RCAHMW – Digital Past online conference 8-12 February 2021. Themes covered 'Digital Heritage, the Environment and Climate Change'. Available here (see 6.1). BBNP – Response and input to consultations for developing land management strategies, woodland creation, riparian improvements, peatland restoration (see 6.3). RCAHMW and partners – CHERISH project work with community groups and individuals to monitor and records assets at risk (see 7.4). SNPA – Carneddau Landscape Partnership Scheme continues. Plans for accredited training in recording and monitoring of historic assets e.g., with Agored Cymru and Conwy Culture Centre. Establishment of community heritage volunteer groups and opportunity to share good practice to seminars/conferences with e-resources (see 2.1-2, 3.1-3, 7.1-5). NT – Climate adaptation core programme team initiated 2021, workshops rolling out across NT Jan 2022 onwards. (see 4.2, 6.1). 	<ul style="list-style-type: none"> HE3
6.3	Work collaboratively across sectors to develop and disseminate joint guidance/	<ul style="list-style-type: none"> Guidance/advisory notes produced and promoted. 	<ul style="list-style-type: none"> Improved cross-sector working, knowledge and understanding, 	<ul style="list-style-type: none"> RCAHMW – Provision of Marine Planning Advice for Marine Development to ensure that coastal/offshore development does not cause further impact on our cultural heritage. (see 6.2). 	<ul style="list-style-type: none"> HE3

	advisory notes that increase the knowledge, understanding and resilience of the historic environment to climate change.	<ul style="list-style-type: none"> Inclusion of climate change adaptation into all aspects of heritage management. Heritage management and business plans with climate change adaptation embedded. Management practices undertaken that showcase climate change adaptation. 	<p>decision-making and the quality of adaptation actions.</p> <ul style="list-style-type: none"> Prevention of secondary damage and maladaptation to the historic environment. Improved management of the historic environment. A well-managed and appropriate programme of adaptation measures. 	<ul style="list-style-type: none"> BBNP – Response and input to consultations for developing land management strategies, woodland creation, riparian improvements, peatland restoration (see 6.2). Cadw – Hosting Welsh Government funded Climate Resilience Embedded Researcher investigating the risks and adaptation of buildings. Findings have helped inform the new WHQS, as well as training standards and emerging guidance (see 3.1, 6.1-2). DAT & GAT contributed to the Shoreline Management Plan refresh in 2021– ensuring SAP referenced in SMPs. (see 5.2) NT – Visitor and Climate Change report, summary published on NT website 2021 (see 2.1, 3.4). NRW – South West Area Statement historic and natural environment completed and published. Working with DAT and Cadw this includes section on climate change related risks. SU, YU – Research publication with case study Dysynni Valley, Gwynedd: by Isabel Cook, Robert Johnston & Katherine Selby (2021) Climate Change and Cultural Heritage: A Landscape Vulnerability Framework, The Journal of Island and Coastal Archaeology, 16:2-4, 553-571, DOI: 10.1080/15564894.2019.1605430 (see 2.1, 7.2). RCAHMW and partners – CHERISH project best practice guidance documents on monitoring change in the coastal zone to be published 2022 (see 6.3 see 2.1-2, 3.1-2, 7.3-4). <i>Update to 2020 response</i>. SNPA – raise the importance of cross-referencing with natural heritage too. Cynllun Eryri is taking a ‘place plan approach’ to assessments, including natural, historical and intangible. NLHF – Environmental sustainability guidance published May 2020, updated Feb 2021 notes both SAP and Cadw flooding guidance. 	
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Resilience: Increase resilience of the historic environment by implementing actions to respond and adapt to the risks					
	Description of the action	Output(s) from the action	Broad outcome/impact	Activity 2021	CCW Indicator
7. Taking action					
7.1	Prepare and implement emergency/adaptation plans (utilising the principles and methods developed for conservation management plans) for vulnerable areas or sites as identified in 2.1 and 2.2. Plans to include multiple work streams if several agencies have identified the need for adaptation measures.	<ul style="list-style-type: none"> Identification of significance, threat, vulnerability and adaptive action. Partnership working with all agencies. 	<ul style="list-style-type: none"> The prioritisation and effective management of resources. 	<ul style="list-style-type: none"> RCAHMW and partners – CHERISH project management plans for principal study sites in progress. RCAHMW – Has a priority recording and at-risk recording programme/strategy to respond to emergency. SNPA – Carneddau Landscape Partnership Scheme continues. Landscape Conservation Action Plan (5 years) 23 partners, includes vegetation management programme focused on heritage assets (see 2.1-2, 3.1-3, 6.2, 7.2-5). NT – Climate change adaptation ambitions embedded in NT Climate and Environmental Management System for in hand buildings and land (working towards external accreditation ISO 14090). DfC (NI) – funded the creation of the templates for an adaptation manual which will be on NT website as a list of chapters (e.g. archaeology), with sections on how climate impacts this area, and key themes around need for adaptation to be developed and updated into the future. 	<ul style="list-style-type: none"> HE4
7.2	Undertake programme of landscape and urban characterisation to inform management of change in both rural and urban areas.	<ul style="list-style-type: none"> Produce characterisation reports for areas at risk, and feed results into conservation management plans 	<ul style="list-style-type: none"> Improved conservation and management of change. 	<ul style="list-style-type: none"> CRDV AONB & NRW – Landscape and Nature Recovery in a Changing Climate Guide completed and published. RCAHMW – Cwmbran characterisation report published available as a free download. SU, YU – Research publication with case study Dysynni Valley, Gwynedd: by Isabel Cook, Robert Johnston & Katherine Selby (2021) Climate Change and Cultural Heritage: A Landscape Vulnerability Framework, The Journal of Island and Coastal Archaeology, 16:2-4, 553-571, DOI: 10.1080/15564894.2019.1605430 (see 2.1, 6.3). SNPA – Started a new project to manage and enhance Snowdonia’s 14 Conservation Areas. The project will ensure sustainable conservation can enhance Conservation Areas to the future (see 2.1-2). SNPA – Carneddau Landscape Partnership Scheme continues. Landscape Character Assessments produced informing Landscape Conservation Action Plan (see 2.1-2, 3.1-3, 6.2, 7.1-5). 	<ul style="list-style-type: none"> HE4
7.3	Prioritised work programmes relating to historic assets at risk such as those identified through 7.1, spatial mapping work (2.1), baseline monitoring (2.2) and through other local and national adaptation plans e.g. shoreline management plans. Where possible to	<ul style="list-style-type: none"> Work programmes underway. Improved protection and preservation of historic assets. Improved management of historic assets. 	<ul style="list-style-type: none"> Mitigation and improved resilience of the historic environment. Acceptance of inevitable change. Partnership working and cross sector coordinated response. 	<ul style="list-style-type: none"> RCAHMW and partners – CHERISH project. Alongside survey and monitoring, work undertaken at several ‘at risk’ coastal sites, e.g. excavation at Dinas Dinlle, Gwynedd with GAT, NT and Cadw, and Caerfai Promontory Fort, Pembrokeshire with DigVentures, NT, PCNP and a wreck dive on the Bronze Bell with MSDS marine (7.2 see 2.1-2, 3.1-2, 6.3,7.4). DAT, PCNPA and partners Ancient Connections Project – excavation at St Patricks Chapel, Pembrokeshire DAT – Excavation of Porth y Rhaw Promontory Fort, Pembrokeshire with Cadw funding and PCNP support. 	<ul style="list-style-type: none"> HE4 MC1

	be preceded by a management plan. Direct actions could range from survey, record and monitoring through to maintenance and conservation measures, erosion control or moving significant vulnerable assets to a place of safety.			<ul style="list-style-type: none"> PCNPA – Continuation of Changing Coasts project using fixed point photography. Communities/public submit photographs at specific coastal path points to monitor change and erosion (see 2.2, 3.1-2, 7.4). RCAHMW – Inter-tidal zone focussed work. Developing methodologies and undertaking work to allow us to monitor sites (see 2.2). BBNP – Active conservation management at a number of historic sites to manage and improve condition e.g. Peatlands Programme Historic Environment Assessment. Continuation of restoration work at Waun Figen Felin, commissioning a palaeoenvironment assessment to improve understanding of evidence baseline & published environmental record pertaining to the park. SNPA – Carneddau Landscape Partnership Scheme continues (see 2.1-2, 3.1-3, 6.2, 7.1-5). 	
7.4	Establish stakeholder/community groups able to monitor assets and respond to significant events such as wild fires and storms to maximise the potential for the discovery of new historic assets and the recording and monitoring of them.	<ul style="list-style-type: none"> Stakeholder/community groups established. Monitoring regimes in place. 	<ul style="list-style-type: none"> Improved knowledge, management and resilience of the historic environment. Raised awareness and appreciation of the historic environment. 	<ul style="list-style-type: none"> PCNPA – Monitoring the condition of scheduled monuments within the National Park using volunteers (system set up in 2020) (see 2.2, 3.1-2). PCNPA – Continuation of Changing Coasts project using fixed point photography. Communities/public submit photographs at specific coastal path points to monitor change and erosion (see 2.2, 3.1-2, 7.3). BBNP – Continuation of volunteer condition monitoring programme ongoing (see 2.2, 3.1-2). RCAHMW and partners – CHERISH project work with community groups and individuals to monitor and records assets at risk (see 6.2). SNPA – Arddwy community groups, community engagement in Dolgellau monitoring fulling mills on the Aran. SNPA – Carneddau Landscape Partnership Scheme continues to help people discover, record, celebrate and care for the cultural and natural heritage of the Carneddau (see 7.1, 7.2, 7.3). 	<ul style="list-style-type: none"> HE4 MC1
7.5	Encourage and implement new planting regimes where trees and hedgerows form a key component of the historic environment to reduce the impact of the spread of disease and increased storminess.	<ul style="list-style-type: none"> New planting regimes that are responsive to plant health trends and are of suitable provenance. The preservation of traditional field boundaries. 	<ul style="list-style-type: none"> Reduced impact of the spread of diseases and storms. Improved management and resilience of trees in the historic environment. Retention and survival of historic character and integrity. 	<ul style="list-style-type: none"> SNPA – Carneddau Landscape Partnership Scheme continues. Carneddau Connectivity National Grid Landscape Enhancement Initiative for more hedges and trees in better condition to cope with change and disease appropriate to the historic landscape, heritage assets and traditional local styles. SNPA – Carneddau Landscape Partnership Scheme continues. Carneddau uplands riparian and scattered tree planting to help slow down water flow. Peatland repair. Reducing flooding along watercourses near assets. 	<ul style="list-style-type: none"> HE4
7.6	Build a resilient recovery from the COVID-19 pandemic.	<ul style="list-style-type: none"> Organisational climate and sustainability plans, policies and actions. 	<ul style="list-style-type: none"> New ways of working that reduce emissions and prepare for climate change. 	<ul style="list-style-type: none"> RCAHMW – Established a Future Generations Group and an Environmental Policy Statement May 2020, work here continues. 	<ul style="list-style-type: none"> HE4

Abbreviations

AC-NMW: Amgueddfa Cymru – National Museum Wales

BBNPA: Brecon Beacons National Park Authority

CITiZAN: Coastal and Intertidal Zone Archaeological Network.

CPAT: Clwyd-Powys Archaeological Trust

CRDV AONB: Clwydian Range and Dee Valley Area of Outstanding Natural Beauty

DAT: Dyfed Archaeological Trust

DfC (NI): Department for Communities (Northern Ireland)

EH: English Heritage

FPAN: Florida Public Archaeology Network.

GAT: Gwynedd Archaeological Trust

GGAT: Glamorgan-Gwent Archaeological Trust

GNSS: Global Navigation Satellite System

HE: Historic England

HEAWG: Historic Environment Adaptation Working Group

HEG: Historic Environment Group

HEGS: Historic Environment Group Climate Change Subgroup

HES: Historic Environment Scotland

NRW: Natural Resources Wales

NT: National Trust

NP: National Park(s)

PCNPA: Pembrokeshire Coast National Park Authority

RCAHMW: Royal Commission on the Ancient and Historical Monuments of Wales

SAP: Sector Adaptation Plan

SCAPE: Scotland's Coastal Heritage at Risk Project

SNPA: Snowdonia National Park Authority

SU: Sheffield University

UAV: Unmanned Aerial Vehicle

UWTSD: University of Wales Trinity St Davids

WATs: Welsh Archaeological Trusts

WCMC: Wales Coast Monitoring Centre

WHQS: Welsh Housing Quality Standard

WG: Welsh Government

YU: York University

Links to Resources

Ancient Connections Project:

<https://ancientconnections.org/>

Barker, L., Bullen, J., Davidson, A., Fairweather J., & Laws, K. (2021). Climate Change and the Historic Environment in Wales. Developing and Delivering a Sector Adaptation Plan, *The Historic Environment: Policy & Practice* 12:3-4, 356-374.

<https://www.tandfonline.com/doi/abs/10.1080/17567505.2021.1944574>

Beizaee, A., Lomas, K., and Firth, S.K., (2013) National survey of summertime temperatures and overheating risk in English homes *Building and Environment* 65, 1–17.

<https://doi.org/10.1016/j.buildenv.2013.03.011>

Cadw guidance Flooding and Historic Buildings in Wales:

[https://cadw.gov.wales/sites/default/files/2019-](https://cadw.gov.wales/sites/default/files/2019-07/Flooding%20and%20Historic%20Buildings%20in%20Wales%20Eng.pdf)

[07/Flooding%20and%20Historic%20Buildings%20in%20Wales%20Eng.pdf](https://cadw.gov.wales/sites/default/files/2019-07/Flooding%20and%20Historic%20Buildings%20in%20Wales%20Eng.pdf)

Carneddau Landscape Partnership Scheme:

<https://www.snowdonia.gov.wales/looking-after/carneddau-partnership>

CHERISH Climate Change and Coastal Heritage project:

<http://www.cherishproject.eu/en/>

CHERISH project eConference 2021:

<https://www.youtube.com/playlist?list=PL3awNDJNynsPs6yXqfGt34EXpM6hT7hXn>

CHERISH #ClimateHeritage stories for COP26, Heritage, Communities and Coastal resilience.:

<https://www.youtube.com/playlist?list=PL3awNDJNynsOYevmfVywKV2dx5suXQoH6>

CHERISH project covered in Channel 4 News special:

<https://www.youtube.com/watch?v=x1HgNtVKEss>

CHERISH project Caerfai Promontory Fort excavation covered in ITC Wales Coast and Country:

<https://www.itv.com/walesprogrammes/articles/coast-and-country-series-9-episode-18>

CHERISH project Caerfai Promontory Fort excavation DigVentures project and dig diary:

<https://projects.digventures.com/caerfai-promontory-fort/background/>

CHERISH project Bronze Bell Wreck Dive, MSDS marine dive diaries:

<https://www.youtube.com/playlist?list=PL3awNDJNynsOzgIRrKqVW-kZ0YJDkSKOp>

Clwydian Range & Dee Valley AONB - Landscape and Nature Recovery in a Changing Climate Climate:

<https://www.clwydianrangeanddeevalleyaonb.org.uk/wp-content/uploads/2016/06/Landscape-Nature-Recovery-ENG-Interactive.pdf>

Cook, I., Johnston, R., & Selby, K., (2021) Climate Change and Cultural Heritage: A Landscape Vulnerability Framework, *The Journal of Island and Coastal Archaeology*, 16:2-4, 553-571.

<https://www.tandfonline.com/doi/abs/10.1080/15564894.2019.1605430>

Fit for the Future Network:

<https://www.fft.org.uk/home>

Hayles, C. S., Huddleston, M., Chinowsky, P., & Helman, J., (2022) Summertime impacts of climate change on dwellings in Wales, UK. *Building and Environment*, 219, 109185.

<https://doi.org/10.1016/j.buildenv.2022.109185>

Hayles, C.; Huddleston, M.; Chinowsky, P.; Helman, J., (2022) Quantifying the Effects of Projected Climate Change on the Durability and Service Life of Housing in Wales, UK *Buildings*, 12, 184.

<https://doi.org/10.3390/buildings12020184>

Historic Environment and Climate Change in Wales Sector Adaptation Plan:

<https://cadw.gov.wales/sites/default/files/2020-02/Adaptation%20Plan%20-%20FINAL%20WEB%20-%20English%20%281%29.pdf>

Historic Environment and Climate Change in Wales Sector Adaptation Plan Monitoring and Evaluation Framework:

<https://cadw.gov.wales/sites/default/files/2021-10/Historic%20Environment%20and%20Climate%20Change%20in%20Wales-Sector%20Adaptation%20Plan%20Monitoring%20and%20Evaluation%20Framework-June-2021.pdf>

National Lottery Heritage Fund - Environmental sustainability guidance:

<https://www.heritagefund.org.uk/good-practice-guidance/environmental-sustainability-guidance#heading-16>

National Lottery Heritage Fund - Local Places for Nature and Community Woodlands grant programmes:

<https://www.heritagefund.org.uk/funding/local-places-nature-guidance>

National Trust Visitor and Climate Change Report - How climate change will affect the future of UK tourism:

<https://www.nationaltrust.org.uk/features/how-climate-change-will-affect-the-future-of-uk-tourism>

Natural Resources Wales - Good Practice Guides on forest resilience covering species, structural and genetic diversity:

<https://naturalresources.wales/guidance-and-advice/environmental-topics/woodland-management/planning-for-the-future/making-woodlands-more-resilient/?lang=en>

Natural Resources Wales - Communicating landscape change from adaptation and mitigation in a changing climate

<https://www.whiteconsultants.co.uk/wp-content/uploads/2020/04/Communicating-landscape-change-final-report-310320r.pdf>

Natural Resources Wales -South West Area Statement:

<https://naturalresources.wales/about-us/area-statements/south-west-wales-area-statement/?lang=en>

Pembrokeshire Coast National Park Changing Coasts project:

<https://www.pembrokeshirecoast.wales/get-involved/changing-coasts/>

RCAHMW Environmental Policy Statement:

<https://rcahmw.gov.uk/about-us/corporate-information/future-generations/environmental-policy-statement/>

RCAHMW Digital Past 2021:

https://www.youtube.com/playlist?list=PLbKw_Ere5rvT-2UpRIk0xX_LIHRdi8Evi

RCAHMW Cwmbrân New Town: An Urban Characterisation Study:

<https://shop.rcahmw.gov.uk/collections/downloads/products/cwmbran-new-town-an-urban-characterisation-study>

Snowdonia National Park Authority – Life Celtic Rainforests Project:

<https://snowdonia.gov.wales/protect/conservation-work/celtic-rainforests-wales/>

Snowdonia National Park Authority – Cyfoeth Ein Corsydd project

<https://www.snowdonia-npa.gov.uk/looking-after/projects/cyfoeth-ein-corsydd>

Snowdonia National Park Authority – Cynllun Eryri:

<https://authority.snowdonia.gov.wales/the-authority/partnerships/cynllun-eryri/>

Welsh Government climate change adaptation plan - Prosperity for all: A climate conscious Wales

<https://gov.wales/prosperity-all-climate-conscious-wales>

Cover photograph: Trefrane Cliff Colliery, Pembrokeshire, following wildfire in August 2022. The fire exposed archaeological features around the Grade II listed brick chimney. The site was recorded by RCAHMW through aerial photography and UAV survey (© Crown copyright. RCAHMW AP_2022_3384).