

Executive Summary

The Case for a Secretariat and Register of Historic Aircraft

Recommendation And Proposal

1. **Recommendation.** It is strongly recommended that option **Register, Accredite and Support** is adopted, whereby a centrally funded secretariat provides strategic and policy management. This has the additional benefit that it is based on a model that is already working in the maritime heritage environment.

2. **Proposal** It is proposed that a secretariat entitled National Heritage Aircraft – UK (NHA-UK) is established, parented by either the Science Museum Group or IWM.

a. Key Responsibilities:

- to act as the primary source of independent and objective advice to the Secretary of State for Digital, Culture, Media and Sport, other government departments, the Devolved Administrations and public bodies on matters which directly or indirectly involve or affect heritage aircraft and the environments in which they are to be found.
- to act as a source of advice to the National Lottery Heritage Fund (NLHF) and other grant-giving bodies across the UK on heritage aviation conservation priorities, and applications they receive relating to funding heritage aircraft, their environments, and associated projects.
- to provide leadership and strategic vision across the UK heritage aircraft communities and wider aviation sectors by acting as the official voice for heritage aircraft, pursuing proactive engagement with the sector, the UK government, the Devolved Administrations, public and private agencies, and communities at large.
- to provide and maintain a register of all UK-based heritage aircraft and conduct an ongoing survey of same over a rolling three-year period.

b. **Organisation and Staff.** Headed by a Director who would be responsible to DCMS and supported by paid roles as follows

- Resources Manager
- Policy and Project Manager
- Projects Officer
- Office Administrator
- Database and Researcher
- Two Aircraft Surveyors

In addition a volunteer Council of Experts would advise the Director.

3. **Budget.** Appendix 5 shows an operating cost of **£410k** a year to provide a full secretariat function.

Introduction

1. Aviation is one of the UKs largest industrial sectors contributing over £32bn net to the economy, providing half a million skilled high technology jobs and allows our island nation to trade globally.

2. Britain is one of the great aviation nations, leading the world in the application of powered flight in the Twentieth Century and, through innovations such as the jet engine, changing the way air transport shaped the modern world. Yet unlike the maritime and railway sectors there is little formal recognition, coordinated management or retention of its national heritage and as a result this is now at risk.

Context

3. Britain has shaped global aviation in a similar way to the way it did maritime and railway technologies. Whilst relatively recent history, aviation holds a key place in our national identity and represents the best of British endeavour and continues to do so.

4. Aircraft are inherently vulnerable because of the way they are made, and need expert care to maintain them, requiring a high level of commitment, skill and resource. Currently historic aircraft are maintained across the public and private sectors, freely traded, scrapped or simply left to deteriorate without reference to their national importance. This is leading to a loss of national heritage which is accelerating over time.

Government Policy

5. National safeguarding of heritage is led by Historic England, but current definitions of heritage do not recognise aviation. The CAA regulates safe flying, including the flying of historic aircraft, but is not responsible for managing heritage aspects of the sector or the non-flying artefacts in the country. DCMS has developed consultation to address wider heritage issues not addressed by Historic England with some success, especially in art, but whilst aviation might fall within the DCMS remit it has yet to be satisfactorily addressed with defining policy. There is no centralised, national strategy for managing aviation heritage or explaining it to the nation.

Current Management of Historic Aircraft

6. **Non-Flying Historic Aircraft.** In the UK collections house over 4500 static aircraft dating from 1903 onwards, of which around 2000 probably have defining national value. They are located in more than 100 aviation museums. There are only eight national level air museums, of which five enjoy partial Government funding: the

remainder are self-funded. All these museums require significant volunteer support to keep them viable. Museums have a voluntary representative body, Aviation Heritage UK, which undertakes limited oversight of and guidance to its members whilst maintaining information on what each collection holds. It has no full-time staff and is only able to support subscribing members, so has a limited view of the sector and no executive capability.

7. Flying Historic Aircraft. Flying aircraft provide the best examples of aviation heritage as they allow people to understand the heritage in its operational setting and aircraft can also display this heritage almost anywhere. Most historic flying aircraft in the UK are privately owned. The CAA regulates historic aircraft that fly in the UK for reasons of modern air safety only. Historic aircraft require highly specialist skills to maintain and their owners are continuously challenged to meet modern safety requirements and keep these aircraft airworthy. When management is delivered only through the oversight of contemporary safety, maintaining historic collections becomes difficult. As a result, aircraft are often sold, taken out of service or exported without oversight. This is leading to a steady loss of historically important flying aircraft within the UK.

Funding and Resource

8. The majority of non-flying aircraft are preserved in the Not for Profit sector. The breadth of teams managing these collections can be expert to enthusiast, professional to amateur. National institutions also manage large numbers of both flying and non-flying aircraft but there is no single unifying body across the sector and many differing funding and revenue streams which drive a variation of outcomes. This in turns mean there is significant potential for historical artefacts to be lost, neglected or traded abroad. Railway and maritime sectors enjoy protection to prevent this through either legislation or national-level coordination or both. Aviation does not and is under resourced to the national detriment.

Value to the Nation

9. UK Aviation tracks the development of our global nation through the fast paced history of the 20th Century from late industrial to information ages. It is part of our identity as a nation, technically important to the country and is in danger of being eroded and lost through omission. Specifically, it provides value to the nation through:

a. **Skills and Knowledge Retention.** Aviation heritage provides a living catalogue of design, innovation, industrial and technical skills from joinery and sewing to high technology composite bonding, all in practical application today.

b. **Education, Inspiration and Sense of Place.** In many locations across the UK Aviation creates and sustains a sense of place which is vital to ensuring the

next generation understanding of one of the country's largest industrial sectors and this is confirmed by the very high percentage of educational visits these sites receive.

c. **Tourism.** Aviation heritage is a major contributor to UK tourism. Air shows for instance, are the third largest outdoor spectator activity in the UK after football and horseracing and contribute £130m net to the UK economy. The network of regional museums account for millions of visitor days per year.

SWOT

10. The state of the sector can be summarised in a brief SWOT analysis:

a. **Strengths,** Collections are well dispersed geographically and accessible. Sites have strong STEM content in an inspiring historical context. Inspiring and large scale live spectacles are provided at shows.

b. **Weaknesses.** Vulnerable nature of historic aircraft means loss inevitable without maintenance. Dispersed collections lack coherent policy with paucity of central evaluation and guidance. Known loss of important artefacts occurs but no control or management is available to address this.

c. **Opportunities.** Central guidance and registration could better protect and maintain rare national artefacts, increase accessibility and safeguard collections

d. **Threats.** Time. Assets, skills and knowledge are all being lost now.

The Case for Formal Management.

11. The global scale and enduring impact that Britain has achieved in aviation as a world leader means this heritage is of national importance. Aerospace activities have had to be creative, innovative and technically leading so they contribute significantly to the national STEM agenda. The heritage is geographically dispersed and accessible to a range of audiences in differing formats, but it lacks cohesive guidance, national standards and strategic direction. This means it is impossible to prioritise activities nationally, monitor the health of the sector or protect important artefacts. In addition to this the vulnerable nature of air assets means that heritage is being lost now through omission and will be significantly damaged in the coming decade if no action takes place.

Solutions

12. Four possible solutions have been identified:

a. **Do Nothing.** The sector is well populated by collections and individual owners who respond well to public interest and are in the majority self-funding. It would be possible to allow market forces to support the sector and retain what heritage remained popular. However, this would be out of step with every other national policy protecting heritage.

b. **Identify and Track.** Existing national bodies, such as the Science Museum Group could be tasked with supporting UK air heritage in providing a more comprehensive tracking and identification process of air-related artefacts. This would have to be limited to the working capacities of both organisations but could provide much needed national level emphasis on the sector although practical implementation of guidance and policy would remain limited.

c. **Register, Accredit, Support.** To exert a stronger influence, record assets, develop national standards for care and accredit those who abide by them the Track and Identify option above could be enhanced with an ability to register historic aircraft and accredit those meeting national standards, producing a common standard across collections. Important assets could be tracked and decisions about their future discussed in the context of their importance nationally.

d. **List and Manage.** An ability to list and manage assets mirroring the listing of historic buildings could completely address the issue. Backed by suitable legislation and authority of a Government department such as DCMS, aircraft could be managed strategically at a national level to ensure a comprehensive range of heritage was maintained. This could provide a very complete solution but would require sufficient resource to underpin and manage a national level regulatory body.

THE CASE FOR A SECRETARIAT AND REGISTER OF HISTORIC AIRCRAFT.

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INTRODUCTION

1. Aviation is one of the most significant industrial sectors within the UK directly contributing at least £32Bn¹ to the UK economy in 2016, generating £28Bn in export revenue and making Britain the third largest participant in aviation worldwide and a global leader in the innovation and exploitation of air and space technologies². It directly provides around half a million skilled and high technology jobs and most importantly allows our island nation to connect internationally in a way no other medium does.
2. Historically Britain is one of the great aviation nations. In America, the Wright Brothers may have pioneered powered flight in 1903, but it was Britain which exploited the invention. During the First World War Britain became the pre-eminent flying nation, so much so that US military personnel were trained in Britain³. It was the UK which first pioneered paid passenger flight,⁴ produced serviceable jet engines,⁵ built the first globally capable aircraft,⁶ and through the 20th Century often lead innovation in the air, culminating in the world's only supersonic airliner to date. Yet unlike the maritime and railway sectors or indeed the built environment, there is little formal recognition of this valuable heritage or the co-ordinated management and retention of its artefacts.

¹ ADS Aerospace Outlook 2017

² Aviation 2050 The future of UK aviation Paper Secretary of State for Transport December 2018

³ US Army engineers were trained at RFC No2 Flight Engineering School from 1916.

⁴ 1 July 1919 Hounslow to Paris, 15 July 1919 Hendon to Paris service.

⁵ Frank Whittle turbojet patent Jan 1930

⁶ De Havilland Comet

BACKGROUND AND CONTEXT

3. British designed and manufactured aircraft drove technical innovation in the air for much of the Twentieth century, played pivotal roles in our national survival, and to this day provide a source of education and inspiration from the highly technical to the romantic. These aircraft hold key places in our national identity, they shaped much of our social history and represent the best of British endeavours over an extended period and will continue to do so into the future.
4. Aircraft are inherently vulnerable. The need for lightness by design means materials are used sparingly and often in structurally complex ways – and the materials used are themselves more difficult to look after than the ferrous metals most commonly used in marine and rail equipment. Historic aircraft present a demanding task to maintain either as flying examples or preserved as non-flying examples on the ground. This requires a high level of commitment, skill and resource without which examples quickly fall into disrepair and are lost to the nation.
5. Currently historic aircraft are maintained by a number of private and public sector museums, charitable and voluntary organisations, commercial corporations and individuals. There is limited national oversight of where aircraft are, their significance and importance, or state of repair. Important examples are unmonitored, exchanged, sold or scrapped without reference to their national importance. The net result is the steady decrease in public accessibility and loss of collective knowledge about our heritage.
6. Museums and Collections are distributed across the UK. There are over 90 independent museums with static aircraft that attract on average more than 10,000 visitors each annually, plus many smaller locations operated by independent groups. Revenues vary from almost nothing to over £20m per annum depending on the size of the establishment. Flying aircraft collections are more difficult to monitor but the Historic Aircraft Association provides partial support across the sector with collections sized between single aircraft to the larger organisations operating up to 20 aircraft but most being privately owned.

GOVERNMENT POLICY

The responsibility for heritage policy is shared amongst Government departments.

Historic England

7. Historic England (HE) has the responsibility for safeguarding heritage. This is clearly defined in Heritage Protection under HE publications⁷ but is limited to: World Heritage Sites, Scheduled Monuments, Listed Buildings, Parks and Garden, Registered Battlefields, and Conservation areas.

⁷ Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment , Historic England , 2008

- Paragraph 7, National Planning Policy Framework , Ministry of Housing, Communities and Local Government, February 2019
- Paragraph 9, National Planning Policy Framework , Ministry of Housing, Communities and Local Government, February 2019

These policies specifically exclude moveable objects such as art works, transportation, and possessions.

The Department for Digital, Culture, Media and Sport

8. Culture and social history lie within the core remit of the Department for Digital, Culture, Media, and Sport (DCMS) and offer broader definitions that allow inclusion of historical assets other than buildings through to items such as industrial skill retention alongside performing arts and more traditional cultural aspects. These are managed through a raft of government legislation, policy and departmental strategies. Their role is to “protect and promote our cultural and artistic heritage”⁸ and therefore have responsibility for managing aviation heritage. There is no central policy or strategy for aviation heritage and the sector is therefore managed locally through private and some public bodies.

The Civil Aviation Authority

9. The Civil Aviation Authority (CAA) is responsible for the regulation of aviation safety in the UK, determining policy for the use of airspace, the regulation of airports, the licensing and financial fitness of airlines and the management of the ATOL financial protection scheme for holidaymakers.⁹ It does not have the remit or the resource to manage heritage issues other than those within its core air safety role, and has oversight only of aircraft maintained on the active civil aircraft register.

Other Policies

10. Areas not protected under HE or DCMS policy seek protection through decentralised means and the lack of a core set of policies is well recognised. In January 2006 DCMS responded with the Secretary for State outlining the pressing need for a more centralized and inclusive approach.¹⁰ Well-founded bodies such as the Museums Association formally replied to DCMS supporting this move but the subsequent 2007 White Paper ‘Heritage protection for the 21st century’ still only addressed the standard HE definition and specifically excluded the more challenging aspects of managing moveable assets.

Current situation

11. The broader management of heritage and cultural assets has been an active area for discussion within DCMS which produced a Cultural White Paper in 2016¹¹ and significant engagement across the heritage and cultural sectors by Government. However, to date there is very little in terms of centralised, comprehensive strategy for the management of heritage assets in the round and sectors are ‘championed’ by a range of bodies both public and privately funded.

⁸ The Department for Digital, Culture, Media & Sport (DCMS) helps to drive growth, enrich lives and promote Britain abroad. We protect and promote our cultural and artistic heritage and help businesses and communities to grow by investing in innovation and highlighting Britain as a fantastic place to visit. We help to give the UK a unique advantage on the global stage, striving for economic success. Source <https://www.gov.uk/government/organisations/department-for-digital-culture-media-sport>

⁹ CAA role <https://www.gov.uk/government/organisations/civil-aviation-authority>

¹⁰ Government Response to the Culture, Media and Sport Committee Report on Protecting and Preserving our Heritage Oct 2006

¹¹ Culture White Paper DCMS 2016

CURRENT MANAGEMENT OF HISTORIC AIRCRAFT

Non-Flying Historic Aircraft

12. In several hundred locations around the UK, there are more than 4,500 static aircraft in conditions ranging from pristine complete airframes through standalone cockpits to almost unrecognisable corroded hulks.¹² The majority of the important British examples, in excess of 2,000, are looked after by a network of over 200 aviation museums or museums that include aircraft in their collections. Some aviation museums are located adjacent to airfields, but many more are located on sites where airfields once were. See Appendix 1 for a map of the larger aviation museums in the UK.
13. There are eight national museums that have permanent aircraft collections: the RAF Museums at Hendon and Cosford, the Imperial War Museum (IWM) at Duxford and Lambeth, the Fleet Air Arm Museum at Yeovilton, the Science Museum in London and Wroughton, and the Museum of Science and Industry in Manchester, and the National Museum of Scotland at East Fortune, funded by central government. The rest – the significant majority – of the aviation museum network are independent, being either privately funded or charities. Certain national museums do not charge entry fees to visitors, but all the private and independent museums rely on visitor entry fees and/or donations for a significant part of the revenue required to pay for the costs of running a museum.
14. The museum sector has a representative body, Aviation Heritage UK (formerly the British Aviation Preservation Council) which as a membership organisation, attempts to provide information, knowledge transfer between museums, networking opportunities and loans for projects. The extent to which Aviation Heritage UK can assist is limited due to the voluntary nature of its team and its limited financial resources, in turn dependent on the limited ability of small voluntary-run museums to contribute to their national body through subscriptions.
15. Private and independent museums may have a few employed staff in supervisory roles but rely very heavily on volunteers to act as guides for visitors and to undertake the protection and conservation work on exhibits. A survey in 2018 showed that across 80 independent museums, there were 195 employed staff and nearly 5,000 volunteers – see Appendix 2.
16. The aircraft in museums are either ex-military or civilian, with the majority being ex-military. Aircraft design has evolved significantly since the first flight in 1903, with faster, more capable, and efficient machines making earlier models redundant. It is examples of these important earlier models that have made their way into museums. The reduction in the size of air forces following the 2nd World War and the end of the Cold War has resulted in a significant reduction in the number of more modern military aircraft being available for museums, which are also finding the costs of acquiring and moving these rare aircraft unaffordable. Even where there are surplus aircraft potentially available to museums, the Ministry of Defence in general now seeks to sell them to the highest bidder, rather than gifting them to museums as was more common 50 years ago.

¹² Reference Wrecks & Relics 26th Edition Published by Crecy Publishing

17. There have been some milestone developments which have changed aviation significantly, for example the move from wooden aircraft to metal ones, the replacement of piston engines by turbines, and the achievement of supersonic flight – aviation museums tell these stories and the social change they caused.
18. By reason of their need to fly, the design of aircraft requires a trade-off between weight and strength. The materials used must be both light and strong; materials with these characteristics used on historic aircraft are vulnerable to the conditions in which they are kept. The gold standard is to keep aircraft exhibits out of the weather in controlled conditions, but very few museums can afford to achieve this for more than a very few of their small aircraft exhibits.
19. Significant effort is required to ensure aircraft that are stored outside do not deteriorate due to the weather. Unsurprisingly, most of the aircraft exhibited outside are the larger examples, such as commercial airliners. Importantly, unique examples of the story of commercial air travel are at risk of being lost to the UK's heritage from weather-related damage such as corrosion, but the cost of providing cover is significant, and may be unaffordable especially for volunteer-run museums.
20. The skills required to conserve older aircraft and the knowledge to explain and interpret the exhibits are possessed mainly by volunteers, and are required to be transferred from one generation to the next. This is by no means a perfect process, so gradually, these skills and knowledge are being lost to the heritage.

Flying Historic Aircraft

21. Set by the Civil Aviation Authority, the regulations that pertain to the flight of historic aircraft have air safety as their prime objective. These regulations distinguish historic aircraft by their origins. Aircraft created for civilian applications – such as the de Havilland Tiger Moth or Rapide – were “type-certificated” as safe by their original manufacturer, a process requiring extensive review and testing, and are flown on a Certificate of Airworthiness, to which one set of CAA regulations applies.
22. Historic aircraft developed for military applications – such as the Supermarine Spitfire and Hawker Hurricane – did not benefit from the same levels of design for safety, are certified as safe from their in-service safety record, and are flown on a Permit to Fly, to which a different set of regulations applies. In this context historic aircraft can be defined as those aircraft which are no longer supported by their Original Equipment Manufacturer (OEM) but which can or will fly. These regulations do try to take into account the historic nature of the aircraft, aiming to keep them in the same technical condition and detailed configuration as the original design.
23. There is a raft of issues pertaining to keeping these aircraft flying, concerning missing or incorrect technical information, loss of relevant maintenance skills and experience, and loss of design experience in heritage materials and systems. The successor companies to those that developed these heritage aircraft and engines are loathe to become involved because of the potential liabilities associated with their use.

24. Whilst faults with airframes and aircraft structure may be rectified, problems with aircraft engines and systems may not be so easily fixed. Historic aircraft are often prematurely grounded because engine life is exhausted, and no replacement airworthy engines are available. Reconditioning of engines, especially turbines, is a costly business, and may be rendered impossible though the lack of data and manufacturing capability for spare parts.
25. Four conclusions can be drawn from the above:
- a. Historic aircraft operation and maintenance is a highly specialist, dispersed and uncoordinated industry with only informal ability to represent effectively pervasive issues that are not directly involved with safety.
 - b. Other than the CAA oversight of safety, there is little national awareness of where or in what condition flying aircraft are and no strategy concerning management of this heritage.
 - c. Risk management within the sector can be poorly developed, has no independent oversight, and seems inflexible, making the CAA regulatory task more challenging than would be the case if the sector was properly represented, integrated and coordinated.
 - d. The number and types in the national fleet of flying heritage aircraft will continue to reduce as engines and systems become more difficult to maintain, in the absence of data and manufacturer support. This has been exacerbated by the restrictions on flying ex-military jets which were introduced in the aftermath of the 2015 Shoreham air show crash, which resulted in many historic British jets being exported or permanently grounded.
26. The value and importance of flying heritage aircraft to the nation in terms of telling the unique story of the development of British aviation, and inspiring new generations, is poorly understood by government and largely uncoordinated. With the exception of the Royal Air Force's Battle of Britain Memorial Flight, the flying of heritage aircraft has been left to private owners and a small number of charitable collections. Both the Royal Navy and the Army have in recent years transferred their collections of flyable heritage aircraft to independent charitable trusts.
27. These flying heritage aircraft are for the most part of significant financial value, but also significantly costly to keep flying in accordance with current regulatory requirements. Once a private owner's interest has moved on, for whatever reason, the evidence is that there is a steady loss of this heritage through sale abroad (enabled through their innate ability to fly) or through aircraft falling into disrepair.
28. It is widely expected that without some formal national oversight, management and consolidation of skills and experience, there is a very significant risk that over the next 20 years many 20th Century British historic aircraft, which were world leading, will not be retained flying within the UK, with the resulting loss of important national heritage.

FUNDING AND RESOURCES

29. Heritage Aviation experiences huge variations in the resources and funding available. The following observations give an insight into the uncoordinated nature of present resourcing:

- a. The majority of non-flying aircraft are preserved in the not-for-profit, voluntary sector which manages the issue of fundraising on a disparate basis rather than the relevance and priority of the assets they own.
- b. The voluntary sector is often dependant on support from local authorities and grant-giving organisations especially to provide the very significant real estate needed.
- c. National institutions and museums provide limited support into both the private and voluntary sectors owing to a lack of policy in this area.
- d. Flying aircraft are primarily funded by the private sector and often wealthy owners who may, or may not, wish to make their aircraft available to the public. This is almost always a matter of personal preference, independently operated and without any national context.
- e. Flying aircraft require compliant maintenance regimes and the relevant facilities and staff to achieve this. These facilities tend to be independent SMEs and available only on a commercial basis at high cost.

30. The variations of funding and resources are reflected in the outcomes nationally; some museums have excellent facilities and aircraft whilst some are severely challenged. The whole is driven by personal preference, market pressure or voluntary contribution without national priority or strategic view of the heritage. This provides an environment where there is tangible risk of assets being lost, mismanaged or misrepresented but most importantly one where priorities and efficient use of resource is impossible.

31. Aviation appears to have been largely overlooked in the management of our national heritage. Certain subject areas are well managed under DCMS and enjoy the support of major national institutions the best example being the built environment through Historic England. National museums manage the various elements of the national collection with clear governance arrangements and the railway and maritime sectors enjoy national level coordination and recognition but aviation does not.¹³

VALUE TO THE NATION

32. The history of aviation development in the 20th century tracks the global interests of the nation and ingenuity needed to maintain it, in the same way that maritime interest did in the 18th and 19th centuries. Technically it is a record of late industrial development that adjoins the information age and in every sense interprets much of our national identity. It may be a fairly recent phenomenon but its impact on the nation should be preserved and we are probably approaching a period when many of the most important examples might be lost completely if action is not taken soon.

Social History

33. Aircraft changed society and Britain was often at the forefront of this global change. From a weapon of war to worldwide transport, the aircraft has changed the way people perceive the world and are able to react with others in it. Aviation enabled the idea of global citizenship and individual aircraft tell the story of that change. Aviation museums allow people to understand

¹³ The 1996 Railway Heritage Act and 2013 report on the Value of Heritage Rail by the APPG on Heritage Rail, 2011 DCMS NGAB established National Historic Ships –UK.

how society was shaped, behaviours changed and attitudes evolved through their collections and are therefore highly relevant to future generations in understanding why Britain and the world is the way it is.

Skills and Knowledge Retention

34. Aviation Heritage provides a living catalogue of industrial skills and knowledge that changed significantly and specifically with the UK. The history of traditional materials skills, including fabric work, joinery and metal work, adapting to the demands of the air are as specific and iconic as the skills inherent at sea or in construction. The history of UK design and engineering in this sector is world class and should be communicated to future generations to inform and inspire. Aviation museums provide STEM in context and make these subjects easily accessible.
35. The aviation industry continues to be led by world class design, engineering and new material technologies but the retention of heritage skills forms the backbone of understanding in many disciplines. Many of these skills are common to other technologies of the late industrial age and enable generations to come to an understanding of how things work. To lose these abilities in aviation would be a singular loss of national history and out of keeping with current practise that reflects other industrial sectors.
36. Many of the current aviation museums provide either paid employment or volunteer opportunities to work directly in this area. IWM Duxford for instance directly supports 450 FTE aviation based jobs on site, nearly 250 engineering volunteer opportunities and over 1040 FTE jobs in the East of England¹⁴ and it is not alone. The heritage sector itself contributes to the provision of skilled jobs and retention and development of knowledge in the sector.

Education, Inspiration and Sense of Place.

37. Other industrial and cultural sectors acknowledge many of the factors mentioned in this paper as the key contributors to that intangible sense of place that is so powerful in inspiring future generations and creating the right environment for education. Heritage aviation achieves this through a mosaic of national sites and artefacts only loosely coordinated and therefore less significant in impact than they might be. There is no doubt that having access to understandable technology acts as a gateway into aviation and engineering careers as well as providing opportunities to inspire design. For instance the IWM airfield at Duxford annually receives visits from 20% of all education establishments in the East of England¹⁵ and over 18% of visitors come from minority groups. Brooklands Museum as a smaller independent operator still hosts over 12,000 students and people from other educational groups a year: they are not alone, and this picture is mirrored in many locations and organisations nationally.

¹⁴ IWM Duxford Social and Economic Impacts Statement 2019.

¹⁵ IWM Duxford Social and Economic Impacts Statement 2019.

Tourism

38. Heritage is the largest sub-sector for UK Tourism drawing both resident and overseas visitors.¹⁶ The contribution of aviation heritage is significant being accessible and well dispersed across the country. In addition to the national museums, many aviation museums record strong attendance figures regionally, hosting about 10 million visitors per year, attracting £100million in direct revenue, and around three times as much in indirect revenue such as hotels and restaurants¹⁷. Air shows form the third largest outdoor spectator activity in the country after football and horse racing, contributing some £130m to the UK economy.¹⁸ Unfortunately this is not fully recognised nationally and fails to draw full support from agencies such as Visit England, in the same way that Maritime and other industrial heritage does. This in turn fails to maximise attendance and revenue generation that leads to resource difficulties and further increases the challenges within the sector.

STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS

A fuller SWOT analysis is given in Appendix 3. However, the significant points are as follows:

Strengths

39. Aviation heritage is relatively well dispersed across the UK making it highly accessible. Flying aircraft take this a further step in being able to travel quickly almost anywhere in the country and fly displays, i.e. the heritage can be taken to the public giving greater accessibility to all. It is remarkably flexible and tells a multitude of national stories from STEM to social history, military, social and political histories.

Weakness

40. The vulnerable nature of historic aircraft and the minimal awareness of the sector mean it is inherently weak. The paucity of measures, benchmarking or central focus means that the heritage is at a very high risk of being lost either through neglect or omission now.

Opportunities

41. A register of heritage aviation assets would provide better visibility of all the issues and the justification for a proper review. This in turn would clearly identify areas that can be developed to improve understanding and the profile of the sector. This in turn could foster closer working with regulatory bodies such as the CAA. Suitable national standards would also assist in a better prioritisation of existing central resources and grants and informed management of key heritage types.
42. The sector needs to plan ahead and consciously develop a national strategy for itself whilst representing these issues on behalf the nation and asset owners. Many of the risks described in this paper could be addressed simply through better coordination of current resources and

¹⁶ Oxford Economics 'The Impact of Heritage Tourism to UK Economics 2016' lists 192m visits to paid heritage attractions in 2016, worth £20.2bn and supporting 386k FTE jobs.

¹⁷ APPGA-HWG Economic Impact report March 2019

¹⁸ British Air Display Association 2018 Post Display Season report

support to the voluntary sector whilst the private sector needs to be engaged pragmatically to work responsibly with scarce assets to the benefit of all stakeholders and the nation. This could be achieved through a nationally recognised association.

Threats

43. Currently the lack of strategy and standards in historic aviation risks the loss of key flying aircraft through sale abroad, failure, the inability to maintain them, or the lack of recognition of their value. It also risks the safe preservation of static aircraft, leading to their loss through corrosion and general deterioration to their point where they can no longer be maintained in a safe condition.
44. Loss of Knowledge, as artefacts and skills are lost, so the knowledge behind them will fade. Without management of the situation key skills will disappear and with them the understanding of the technology and the heritage.

THE CASE FOR FORMAL MANAGEMENT

A Leading Nation

45. Whilst historically aviation might be considered a recent phenomenon and very much characteristic of the 20th Century, its enduring impact on the world means its heritage is of national importance. Britain should value its aviation heritage because:
 - a. The UK is one of the leading aviation nations of the world supported by one of the most vibrant and active industrial sectors in the country. Its success ought to be explained and valued for future generations.
 - b. British human and technical endeavours in this sector have often led world events, shaped the social history of the modern world over the last 100 years and continue to do so.
 - c. The British aviation sector has shaped the modern world at least as significantly as have the Rail and Maritime sectors, and this can inspire future generations within the UK.

Visibility and Priority

46. Aviation assets are currently managed in an *ad hoc* manner through a mix of private, charitable and some public facilities which means:
 - a. There are variable standards of care and interpretation of scarce assets.
 - b. The public gain limited access to their heritage.
 - c. There is no management of assets with unique relevance to the UK meaning they can be taken out of the country without recognition of the loss of heritage.
 - d. It is impossible to prioritise funding across the sector and very difficult to provide visibility of the sector to grant making organisations who might support the activity.

Time

47. There is limited time to undertake concerted action as aviation heritage is often the victim of very high rates of degradation because:

- a. Aviation tends to have a high rate of technical development. Innovation happens quickly and historic assets and infrastructure change quickly. Failing to identify key aspects of the sector, value and prioritise them means they may be completely lost to the nation.
- b. The very nature of aircraft construction makes them highly susceptible to corrosion and damage. They are demanding to conserve and require specialist skills to maintain.

OPTIONS

Do Nothing

48. The current range of private, voluntary and public funded activity maintains a large number of flying and non-flying aircraft across the country and a number of historic locations associated with flying. This is largely funded through admissions charges with limited liability to the public purse. National museums such as the Science Museum Group and the IWM support regional activities through their Subject Specialist Networks and this is done at minimum cost to the nation. It is probable that the most notable objects and assets could be retained through these arrangements although recent evidence suggest that market force does favour certain items: there are five fully preserved Concordes in covered museums, for instance whilst rare less famous aircraft are left to the elements. However, this would be out of step with almost every other area of national interest which receives closer Governmental attention.

Identify and Track

49. National museums already maintain a view on their respective disciplines and areas of interest. Whilst their primary interest must remain with managing their respective elements of the National Collection there could be a requirement raised to maintain a working watch on heritage aviation assets, other than those in the built environment that would remain the responsibility of Historic England. Working efficiently this might track where key assets are and what condition they are in by specialist areas and it would utilise the significant expertise in Government bodies, provided there was capacity to undertake the work. It would, however, only be an observation function, not allowing much active influence in the sector and would be shared amongst several government organisations so a clear central understanding of the sector would be challenging¹⁹. How some of the risks and opportunities might be addressed would need further consideration.

¹⁹ AHUK does attempt to maintain on a voluntary basis a register of historic aircraft held in museums and private collections in the UK, and has identified which of those aircraft it believes to be the most important to the national collection through rarity and/or service significance. However, AHUK has neither the remit or resource to establish the risk to the survival of any individual aircraft in the way that, for instance, Historic England maintains a register of buildings at risk.

Register, Accredit, and Support

50. To exert a stronger influence on the ability to record assets, develop national standards and accredit those who abide by them would significantly influence the sector for the better. This would also allow a national, and authoritative view of what is going on and inform prioritisation of support and resources where and when they became available. The model used by the National Historic Ships UK agency (NHS-UK) see Appendix 4 is a proven methodology in this respect. It is worthwhile noting that at the moment very few of the aviation museums and collections are accredited under the schemes administered by Arts Council England and its equivalents in the other nations. This is not through lack of will on behalf of the majority of museums, but more through lack of resource and experience or understanding of their national significance.

List and Manage

51. A more comprehensive management method would be to parallel the measures in place for the built environment. Assets would be listed: in reality many aviation-related buildings and areas are already managed in this manner, and the main task would therefore be identifying and listing mainly aircraft that are of national importance. This would have to be done under the aegis of a government authority with powers to regulate those assets on behalf of the nation. This might sit within Historic England or perhaps a new secretariat of the CAA (although the mix of flying and non-flying aircraft might not be appropriate for either body) or DCMS itself. There would be a remit to monitor and assess assets, process applications for change and enforce regulatory issues nationally which might require a substantial staff and time to set up. It would substantially regulate, control and protect these assets on behalf of the nation. Such a proposal maybe be met by resistance particularly in the private and voluntary sectors and would require sufficient resource to address this.

RECOMMENDATION

52. Options **Do Nothing** and **Identify and Track** will do little to address and provide a solution to the situation, and option **List and Manage** is likely to be relatively expensive and meet resistance from those in the sector. Therefore, it is strongly recommended that option **Register, Accredit and Support** is pursued. This has the additional benefit that it is based on a model that is already working in the maritime heritage environment.

PROPOSAL

53. It is proposed that a secretariat entitled National Heritage Aircraft – UK (NHA-UK) is established, parented by either the Science Museum Group or IWM.

54. The remit of National Heritage Aircraft UK secretariat is proposed to be:

- to act as the primary source of independent and objective advice to the Secretary of State for Digital, Culture, Media and Sport, other government departments, the Devolved Administrations and public bodies on matters which directly or indirectly involve or affect heritage aircraft and the environments in which they are to be found
- to act as a source of advice to the Heritage Lottery Fund (HLF) and other grant-giving bodies across the UK on heritage aviation conservation priorities, and applications they receive relating to funding heritage aircraft, their environments, and associated projects
- to provide leadership and strategic vision across the UK heritage aircraft communities and wider aviation sectors by acting as the official voice for heritage aircraft, pursuing proactive engagement with the sector, the UK government, the Devolved Administrations, public and private agencies, and communities at large.
- to provide and maintain a register of all UK based heritage aircraft and conduct an ongoing survey of same over a rolling three-year period.

55. This remit will be carried out through a range of functions and activities.

It is proposed that DCMS is appointed to be the sponsoring department, and that an annual grant through of £410,000 is sought from DCMS to fund the organisation.

ORGANISATION AND STAFF

56. It is proposed that the NHA-UK is headed up by a Director reporting into DCMS, with funding flowing through IWM, as it does through the National Maritime Museum to National Historic Ships – UK. The Director will receive guidance from a Council of Experts drawn from the historic aircraft community. The Director would be supported in carrying out the role of the secretariat by a small team:

Director and Chair of the Council of Experts
Policy and Project Manager
Resources Manager
Projects Officer
Office Administrator
Database and Researcher
Two Aircraft Surveyors

57. COUNCIL OF EXPERTS

A Council of Experts drawn from across the heritage aircraft and heritage conservation sectors and chaired by the Director should be established to advise and support staff and volunteers.

58. BUDGET

The annual funding required to run NHA-UK is estimated to be £410,000. An analysis of this budget is given in Appendix 5.

APPENDIX 1 – THE NETWORK OF UK AVIATION MUSEUMS



APPENDIX 2 – SURVEY OF INDEPENDENT AVIATION MUSEUMS – JUNE 2018

Member Name	1. Total visitors	2. Total Revenue	Rev/visitor	3. Group visits	4. Total employees	5. Total Volunteers
2AV8	30	0	0	0	0	1
Aerial Application Collection	0	500		0	0	20
Aero Engines Carlisle	0	0		0	0	5
Aeropark Volunteers Association	15,600	92,110	6	42	0	78
Aeroplane Collection	220	3,586	16	0	0	28
Aircraft Restoration Group	520	5,600	11	0	0	35
Airfield Research Group	0	8,000		0	0	150
Aviation Data Research	0	0		0	0	1
Aviation Preservation Society of Scotland	1,060	1,800	2	20	0	60
Avro Heritage Museum	12,000	206,288	17	58	0	200
Bentwaters Cold War Museum	3,063	17,620	6	6	0	26
Boscombe Down Aviation Collection	8,643	158,581	18	35	0	175
Boulton Paul Association	0	400		0	0	22
Bournemouth Aviation Museum	13,907	97,531	7	54	0	81
Bristol Aero Collection	86,402	1,780,000	21	4,458	40	194
Britannia Aircraft Preservation Trust	550	1,528	3	0	0	12
British Balloon Museum & Library	0	650		0	0	35
Brooklands Museum	183,188	4,100,000	22	4,000	45	800
Catford Independant Air Force	6	2,800	467	0	0	5
Chiltern Aviation Society	0	800		0	0	26
City of Norwich Aviation Museum	18,620	74,887	4	38	6	65
Cotswold Aircraft Restoration Group	0	0		0	0	9
Davidstow Airfield & Cornwall at War Museum	10,200	45,000	4	30	0	15
de Havilland Aircraft Museum	16,650	241,000	14	38	1	144
Dumfries & Galloway Aviation Group	8,500	97,181	11	15	0	43
Duxford Aviation Society	200,000	120,000	1	88	4	180
F-4 Phantom Preservation Society	0	250		0	0	6
Friends of Metheringham Airfield	14,200	83,886	6	38	0	58
Gatwick Aviation Museum Ltd	4,362	70,000	16	50	1	30
Handley Page Association	0	650		0	0	65
Harrington Aviation Museum Society	1,250	11,242	9	3	0	28
Heathrow Trident Collection	3	10	3	0	0	2
Historic Croydon Airport Trust	2,984	15,920	5	13	0	21
Jaguar	60	8,000	133	0	0	6
Jet Age Museum	18,500	143,216	8	42	0	87
LAAS International	0	0		0	0	6
Lashenden Air Warfare Museum	580	11,439	20	10	0	42
Lightning Association	0	0		0	0	12
Lightning Preservation Group	0	520		0	0	28
Lincolnshire Aircraft Recovery Group	0	680		0	0	38
Lincolnshire Aviation Preservation Society	12,100	180,000	15	28	8	66
Medway Aircraft Preservation Society	500	4,000	8	10	0	50
Midland Air Museum	26,500	188,069	7	23	5	130
Montrose Air Station Heritage Centre	6,500	45,704	7	15	0	32
Morayvia	6,000	45,000	8	20	0	70
Museum of Army Flying	28,777	1,547,233	54	1,101	35	47
Museum of Berkshire Aviation Trust	4,120	8,500	2	27	0	25
Napier Power Heritage Trust	0	1,500		0	0	35
Newark Air Museum	26,892	327,547	12	34	11	110
Norfolk & Suffolk Aviation Museum	25,500	89,000	3	40	1	45
North East Land, Sea and Air Museum	9,730	65,294	7	38	1	68
RAF Manston Museum	13,570	67,774	5	62	0	72
RAF Museum Laarbruch Weeze e.v.	3,000	10,000	3	18	0	25
Royal Aero Club Trust	100	1,500	15	0	0	11
Solent Sky	22,000	150,000	7	100	3	50
Solway Aviation Museum	5,113	39,992	8	16	0	86
South Yorkshire Aircraft Museum	18,500	135,000	7	60	2	40
Suffolk Aviation Heritage Group	800	6,710	8	12	0	28
Tangmere Military Aviation Museum	31,850	415,000	13	116	1	145
Tettenhall Transport Heritage Centre	3,250	8,786	3	0	0	25
The Air-Britain Trust Ltd	0	24,824		0	0	125
The Britten-Norman Aircraft Preservation Society	700	7,500	11	10	0	15
The Helicopter Museum	32,600	235,341	7	86	7	165
The Miles Aircraft Collection	0	800		0	0	30
The Stirling Aircraft Project	160	8,500	53	12	0	26
The W O Bentley Memorial Foundation	5,620	72,986	13	23	1	62
Trenchard Museum	9,000	4,000	0	87	0	26
Ulster Aviation Society	6,500	66,100	10	76	0	63
Viscount Preservation Trust	0	0		0	0	6
Vulcan Restoration Trust	2,600	53,300	21	24	0	25
Vulcan to the Sky Trust	24,000	1,200,000	50		6	25
Wellesbourne Aviation Group	1,200	2,975	2	5	0	16
Whirlwind Fighter Project	0	17,000		0	0	58
Wight Aviation Museum	0	8,500		0	0	25
Wings Museum	12,650	90,593	7	56	0	68
XM655 MAPS	1,200	2,975	2	5	0	16
Yorkshire Air Museum	42,000	876,340	21	150	17	130
Yorkshire Helicopter Preservation Group	18,500	3,200	0	0	0	28
Totals	1,022,630	13,413,218		11,292	195	4,908
Revenue per visitor		13.12				

APPENDIX 3 - STRENGTHS, WEAKNESSES OPPORTUNITIES AND THREATS

Strengths

Apart from its historic importance aviation heritage is relatively well dispersed across the UK making it highly accessible. Flying aircraft take this a further step in being able to travel quickly almost anywhere in the country and fly displays, i.e. the heritage can be taken to the public giving greater accessibility to all. STEM can be and sometime is well supported by aviation heritage organisations, as aviation is a unique blend of science, technology, engineering and mathematics. As a heritage medium aviation heritage is remarkably flexible and tells a multitude of national stories from STEM to the arts, military, social and political histories giving almost unparalleled reach to the public.

Weaknesses

The vulnerable nature of historic aircraft, the very dispersed and independent nature of ownership, and the minimal awareness of the sector means that it is currently inherently weak. From its ability to leverage grants and funding to prioritising items with national importance the paucity of measure, benchmark or central focus means that heritage it at a very high risk indeed of being lost either through neglect or omission.

Opportunities

Recognition and Exploitation. An initial step to recognise aviation assets, as Rail and Maritime areas are, would provide better visibility of all issues and justification for proper review. This in turn would clearly identify areas that can be developed and better exploited to the benefit of the nation, improve understanding and the profile of the sector.

Appropriate Compliance and standards. Many of the current issues are compounded by policies designed for modern aviation. An informed authoritative national view within the sector could inform closer working with regulatory bodies such as the CAA, providing more appropriate management of assets through better regulation. Suitable national standards would also assist in a better prioritisation of existing central resources and grants and informed management of key heritage types. It would also inform and develop complimentary relationships with other heritage bodies within the UK.

Representation and development. The sector needs to plan ahead and consciously develop a national strategy for this fast developing sector whilst representing these issues on behalf the nation and the asset owners. Many of the risks described in this paper could be addressed simply through better coordination of current resources and support to the voluntary sector whilst the private sector needs to be engaged pragmatically to work responsibly with scarce assets to the benefit of all stakeholders and the nation. This could be achieved through a nationally recognised association.

Social and Economic Impact. Aviation museums and collections and the Air Display Industry contribute significantly to social and economic wellbeing. National coordination of the sector could provide increasing returns for the UK through better support to regional assets, evaluation of performance and development of sector best practise.

Threats

This review has identified three strategic threats:

- a. **Loss of National Heritage.** Currently the lack of strategy and standards in historic aviation risks losses of:
 - i. key flying aircraft through sale abroad because there is little recognition of their national importance and maintaining them in the UK is difficult.
 - ii. airworthy aircraft through failure or inability to maintain them through a lack of resources or skills.
 - iii. important historic aircraft examples owing to lack of recognition of their value or the prioritised resources to maintain them, or both.
- b. **Accelerating Decline.** Many assets are in decline through lack of proper care regimes either through lack of resource, recognition or available skills. There is very limited visibility nationally of the situation and the UK is at very real risk of losing assets as a result of accelerating degradation.
- c. **Loss of Knowledge.** As artefacts and skills are lost so the knowledge behind them will fade. Without management of the situation key skills will disappear and with them the understanding of the technology and the heritage.

APPENDIX 4 - NATIONAL HISTORIC SHIPS UK

National Historic Ships UK (NHS-UK) is a secretariat within the National Maritime Museum and is provided with ring-fenced DCMS funding. Its main function, and indeed the reason it was set up, was to produce and maintain a register of British historic ships that exist around the world but mainly in the UK.

NHS-UK actively encourages registration of historic assets and provides oversight of all historic vessels of British origin. It produces a comprehensive framework for establishing the condition of vessels therefore prioritising their care. It accredits those owners who meet its standards providing a highly valued quality mark for owners, but more importantly an effective engagement method within the sector. Based on this broad visibility, endorsed standards and accredited vessels NHS-UK is in a unique position of being able to advise grant giving bodies and Government alike in prioritising funding and protecting heritage that falls at risk of being lost. It holds a single view of the sector and is undertaken by a relatively small full-time team supported by a national museum, so it is able to draw on specific technical expertise as required.

NHS-UK carries a wide remit, looking not only at the immediate issues concerning historic vessels in the UK, but also addressing questions relating to the support infrastructure for historic ships, their potential for contributing in the wider economic, social and community context, and maintaining a watch list of vessels abroad with potential UK significance.

NHS-UK offers advice on grants, training opportunities, conservation standards and techniques, and supports projects to develop skills and knowledge across the sector.



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PROJECTS

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PUBLICATIONS

Our publications on historic vessels



LINKS

Here you'll find links to other useful websites

APPENDIX 5 - NATIONAL HISTORIC AIRCRAFT UK – ANNUAL BUDGET

Salaries					
Director					£45,000.00
Policy and Project Manager					£35,000.00
Resources Manager					£25,000.00
Project Officer					£25,000.00
Office Administrator					£20,000.00
Database					£25,000.00
Surveyor 1					£30,000.00
Surveyor 2					£30,000.00
Total					£235,000.00
Pensions					£18,800.00
NIC					£23,500.00
Travel Cost					£6,000.00
Hotels					£9,500.00
Subsistence					£6,000.00
Office Equipment					£2,000.00
Printing					£15,000.00
Subscriptions					£1,000.00
Public Relations/events					£10,000.00
Service Level Charges					£15,000.00
Professional Fees					£60,000.00
Council and Team Outreach					£7,000.00
Grant Awards					£1,000.00
					£409,800.00