Maritime & Coastguard Agency

Bristow Search and Rescue

English Channel Airspace Requirements – (ACP 2021 088)

Stage 2B Options Appraisal (Phase 1 Initial) Including Safety Considerations.

10 October 2023.

Maritime & Coastguard Agency

Bristow Search and Rescue

Table of Contents

TARGET ZERO The Bristow Group Culture of Safety

Introduction

Bristow is currently progressing ACP-008-2021 on behalf of the Maritime and Coastguard Agency (MCA) and the Home Office (HO). This ACP aims to deliver a suitable airspace construct, to enable Uncrewed Aircraft System (UAS) operations in support of HM Coastguard and the wider UK Government response to small boat crossings of the English Channel.

This document should be read in conjunction with complementary documents, which can be found on the CAA airspace change portal - https://airspacechange.caa.co.uk/

- Stage 2A – Design Principle Evaluation [Revision 1], dated 06 September 2023.
- Stage 2A – Airspace Design Options Refinement [Revision 1], dated 06 September 2023.
- Stage 2A – Design Options version 5, dated 23 Dec 23.
- Stage 1B – Stakeholder Feedback Post Stage 1B Engagement period, dated 13 Dec 23.
- Stage 1B – Stakeholder Engagement Document (Design Principles), dated 22 Sep 23.
- Stage 1A – Statement of Need, dated 5 Jan 22.

This document sets out the initial appraisal of the airspace options developed through engagement with stakeholders in Stage 2A.

This Document

- The purpose of this document is to qualitatively appraise the impacts of the airspace design options progressed from Stage 2A against the Option 0 – Base Line which was previously discounted as part of Stage 2A.
- It also provides brief safety statements of the design options, which will be further refined with the Air Navigation Service Provider (ANSP) in the next stage of the process (Stage 3).
- Option 0 – Baseline included within this document includes historical traffic data for the airspace impacted by the design options. A suitable forecast will be required as part of the quantitative analysis in Stage 3.
- Each option has been assessed in isolation against the Option 0 – Baseline.
- The appraisal of the impacts is qualitative and high level, the assessment criteria based on the opinions of subject matter experts and feedback derived from stakeholders.
- All published documents for all stages of the process to date can be found in the public CAA's Airspace Change portal (link).

The Assessment Criteria

Table 1 – Impact Assessment Criteria, below, sets out the approach BHL has used to assess the impact of the airspace options and is based on CAP 1616, annex E, table E2.

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life, and includes impact on tranquillity due to proximity to SSI and AONB.	Qualitative

A qualitative assessment of the change in tranquillity of the airspace options vs the Option 0 – baseline, specifically the Area of Outstanding Natural Beauty – Kent Downs, Dungeness, Romney Marsh and Rye Bay – SSSI, Dover to Kingston Cliffs – SSSI, and the National and Local Nature Reserves on Kent Coast.		
Communities	Air Quality	Qualitative
A qualitative assessment of changes to local air quality compared with the Option 0 – Baseline.		
Wider Society	Greenhouse gas impact	Qualitative
A qualitative assessment of changes to greenhouse gas impacts compared with the Option 0 – Baseline.		
Wider Society	Capacity / resilience	Qualitative
A qualitative assessment of changes to airspace capacity and resilience compared with the Option 0 – Baseline.		
General Aviation	Access	Qualitative
A qualitative assessment of changes to general aviation access to Class G airspace compared with the Option 0 – Baseline.		
General Aviation / Commercial airlines	Economic impact from increased effective capacity	Qualitative
A qualitative assessment of changes to general aviation and commercial airline economic impacts from airspace options when compared with the Option 0 - Baseline.		
General Aviation / Commercial airlines	Fuel Burn	Qualitative
A qualitative assessment of changes to general aviation and commercial airline fuel burn compared with the Option 0 – Baseline.		
Commercial Airlines	Training costs	Qualitative
A qualitative assessment of changes to commercial airline training costs compared with the Option 0 – Baseline.		
Commercial airlines	Other costs	Qualitative
A qualitative assessment of changes to other relevant commercial airline costs compared with the Option 0 – Baseline.		
Airport / Air navigation service provider	Infrastructure costs	Qualitative
A qualitative assessment of changes to air navigation service provider infrastructure costs compared with the Option 0 – Baseline.		
Airport / Air navigation service provider	Operational costs	Qualitative
A qualitative assessment of changes to ANSP operational costs compared with the Option 0 – Baseline.		

Airport / Air navigation service provider	Deployment costs	Qualitative
A qualitative assessment of ANSP deployment costs compared with the Option 0 – Baseline.		

Table 1: Impact Assessment Criteria.

Table 2 – Safety Assessment, below, sets out the format for the qualitative safety assessment of the airspace options and is based on CAP 1616, annex E, table E2.

Qualitative Safety Assessment
A qualitative high-level safety appraisal of the Airspace Design Option.

Table 2: Safety Assessment.

Separate tables have been prepared for each design option including Option 0 – The baseline (previously discounted). Option 0 has been used as the baseline against which the impact of a design options has been measured against.

Options Assessment

This Initial Options Appraisal is the first stage in a three-phase appraisal of airspace change options. It involves the qualitative appraisal of the airspace change options that have progressed from Stage 2A. As options progress through the airspace change process, the two following appraisals, the Full Options Appraisal and Final Options Appraisal undertaken at Stage 3 and 4, will quantitively evaluate the options in further detail.

Although the 'do nothing' scenario (Option 0) did not progress from Stage 2A, it was apparent from Stakeholder feedback that greater understanding of the airspace baseline was required. CAP1616 requires the baseline scenario to be appraised, as it provides a means of testing the options against the pre-Temporary Danger Area airspace complex, to understand the impacts of each option. Consequently, Bristow committed to improving the understand of the Option 0 – Baseline as part of Stage 2B, which is included in the next section.

Option 0 – The Baseline 'do nothing' option was discounted at the Design Principle Evaluation stage for the following reasons:

- It did not address the requirements of the Statement of Need.
- It did not meet the current CAA UAS and Airspace regulatory framework.
- Did not meet the required levels of safety.

Two airspace change options were progressed that were developed at Stage 2A and assessed as part of the Design Principle Evaluation. For more information, please refer to Design Principle Evaluation [Revision 1] dated 6 September 2023:

- **Option 1A – Danger Area with Danger Area Activity Information Service (DAAIS).**

- **Option 1B – Danger Area with Danger Area Activity Information Service (DAAIS) and Danger Area Crossing Service (DACS).**

Option 0 – The Baseline

Background

As part of this Initial Options Appraisal CAP1616 requires airspace change sponsors to set a baseline year which is used for the evaluation of the options. The baseline for this airspace change was set as a full year without any segregated airspace complex within the channel, as this would allow the impact of any segregated airspace to be assessed. As the current Temporary Danger Area (TDA) EG D098 complex was put in place in 2020, the preceding year without any segregated airspace 2019 was therefore selected as the baseline year for this ACP.

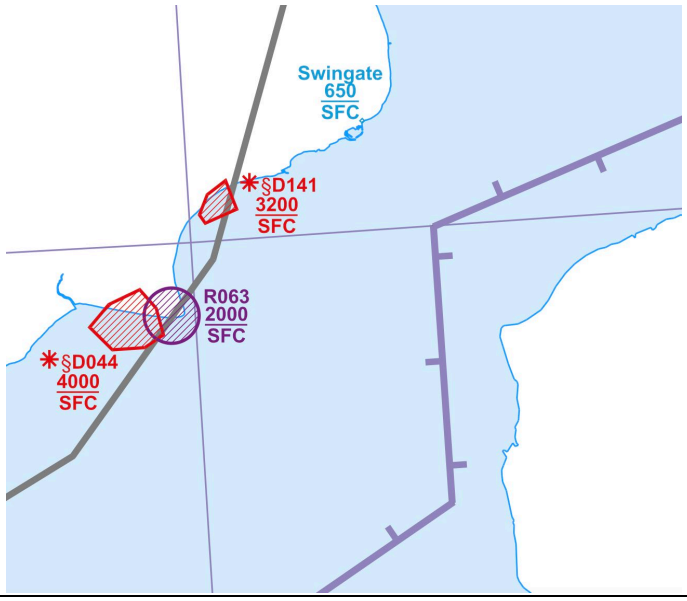
Airspace Summary

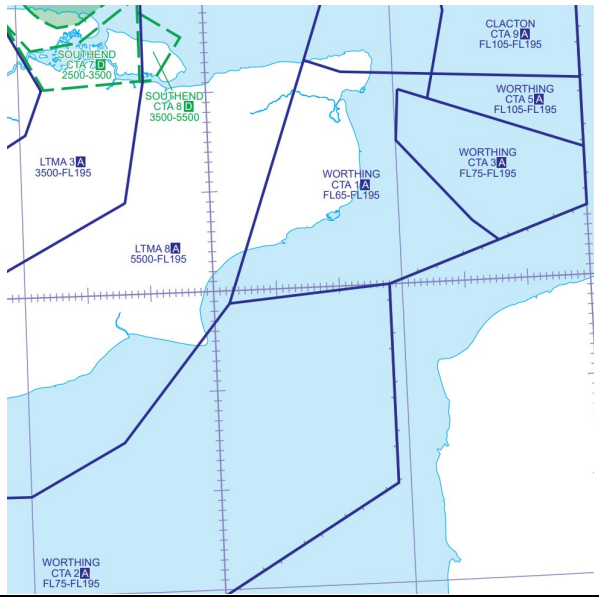
Description:
• The baseline of the airspace construct to be used for this airspace change proposal is the airspace environment that existed prior to the existence of the Temporary Danger Area (TDA) complex D098. • A series of Controlled Airspace (CTA) structures are in existence with the lowest starting at 5500ft. Below this is Class G airspace which is the focus of this ACP. • This airspace environment has been defined as Class G airspace, the Dungeness Restricted Area (over Dungeness Power Station), Dover Port Restricted Flying Zone, and the Lydd and Hythe Ranges Danger Areas.

- It is this airspace environment that will form the baseline to be used to assess the impacts of the airspace options moving forward into Stage 2B.
- It does not include the TDA D098 complex that has been in existence for approximately 3 years and has been extended on a rolling basis at the discretion of the CAA to meet UK Government requirements.

Design:

- Class G airspace below Controlled Areas (CTAs).
- International boundary with EU - Purple.
- Danger Areas – Red hatched areas.
  - Lydd Ranges
  - Hythe Ranges
- Restricted Areas
  - Dungeness Power Station – Purple hatched area.
  - Dover Port - Light blue.





DAAIS/DACS

- Nil.

Promulgation:

- Not applicable.

Airspace Management:

- Class G airspace requirements only.
- No novel technology such as Detect and Avoid / See and Avoid capability is currently approved for use on UAS by the CAA or EASA, therefore has not been considered.

Coordination:

- Not applicable, standard Class G requirements.

Air Traffic in 2019

Air traffic within Class G is unpredictable in nature owing to its unmonitored status and the freedom for air users to use it unconstrained. However, we have sought to improve understanding of the airspace and air traffic by using three data sources:

- Traffic data from Lydd London Ashford Airport.
- Stakeholder feedback.
- Third Party ADSB transponder transmissions in 2019, which would have placed the transmitting aircraft within the airspace volume or within the proximity of the existing Temporary Danger Area complex (EG D098).

It is estimated by extrapolation that 844 movements to/from foreign airfields arriving/departing from Lydd out of the non-local 6095 movements (these exclude local flights and touch-and go) to/from 247 different international and domestic aerodromes. By comparison, the annual total of all movements at Lydd including the local flights/circuit training etc. will be just under 29,000 for 2022.

Regarding non-landing transits/overflights through the Lydd Airport Airspace and receiving a service from Lydd APP, the annual total for 2019 was 2245. If we therefore estimate that for the NW/SE transits to/from UK to N France and thereby crossing the ACP area of interest would be 50% of the total circa. 1123. The 2022 total figure is likely to be just above 2000, which equates to a 10% drop in GA transits, despite the Airport's movements/activity increasing by over 9% over the same period.

The estimated total number of General Aviation (GA) flights crossing the English Channel and working Lydd APP is approximately 1844 per annum. This figure does not include UAS, SAR(H), Military Aircraft and other UK Government sponsored aircraft in the TDAs, nor does it include traffic working London FIR (as this data is not readily available).

The bulk of the transits occur between 1000 and 1700 hours, (limited as they are by the opening and closing times of their base aerodromes) and in the summer, most go across at 2000-5500ft, with only a handful of (mainly) light helicopters wanting lower. Lydd Airport arrivals and departures from/to the SE seem to just about manage to clear the 1500ft TDA ceiling without having to do an overhead departure or non-standard join.

General Aviation traffic would most likely route directly from their point of departure to their point of destination, using either VFR or IFR dependent on prevailing conditions and their operating approvals.

Using ADSB data from 2019, two graphics for each month have been generated that show aircraft routes which would have entered the proposed airspace volume if it was in place (Annex B). The first shows the truncated air traffic routes that would be impacted by the segregated airspace volume and the second shows the density of aircraft.

What can be seen from figures 1 to 24 is that there is a significant proportion of aircraft operating within the proposed airspace, that are flying short flight profiles emanating from Lydd Airport into the proposed airspace volume and returning or conducting search flight patterns predominantly with the bounds of the proposed segregated airspace. These flights are MCA or HO aircraft assets engaged on Search and Rescue responses and / or small boat response, which is supported by the aircraft density figures which clearly identifies areas of high aircraft density.

Cross channel traffic using the proposed airspace volume can be seen to be greater in the months March through to September which coincides with a general increase in activity spanning the summer months. This seasonal trend is further visible in Figure 25 below, where transponding aircraft that entered the proposed segregated airspace volume have been mapped, with months on the x axis and time on the y axis.

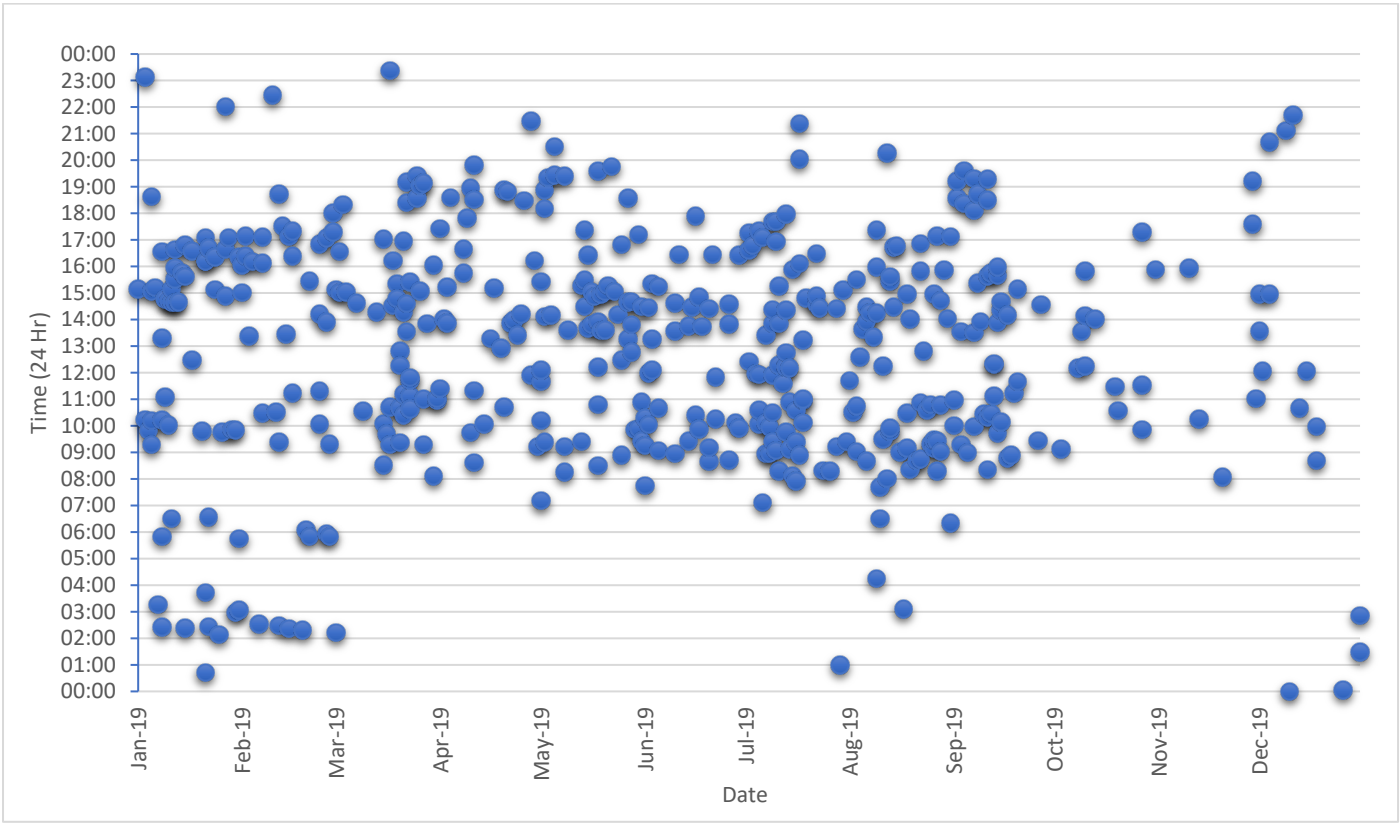


Figure 25: 2019 - Aircraft transponder signal within proposed segregated airspace volume.

In addition, ADSB data in Figure 25 supports the air traffic information from Lydd Airport, that most of the traffic takes place between 0830 and 1900 hours which aligns to Lydd Airport's opening times and hours of daylight across the seasons. It is further likely that a significant proportion of flights outside of these hours are MCA aircraft assets engaged on Search and Rescue responses.

Impact Assessment (Baseline)

The impact assessment for Option 0 - The Baseline, which was discounted during Stage 2A, has been provided for comparison.

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life, and includes impact on tranquillity due to proximity to SSI and AONB.	Qualitative
If the baseline was retained, there would be limited change to flight paths and altitudes of General Aviation or Commercial Airline traffic, and therefore limited in change to the impact currently generated from aircraft traffic transiting in and out of Lydd Airport. For example, some areas of the Romney Marsh AONB are overflown below 1,000ft, which has an impact on		

tranquillity. However, as the airspace volume is over the sea, any air traffic operating in this will a very limited Noise impact, with transits of these aircraft having an impact.

However, increasing numbers of persons crossing the channel in small boats. are forecast, and with it, HMG associated crewed aircraft as part of the HMG small boat response, this will likely lead to greater Noise impact should crewed aircraft be used. There would be limited opportunity to reduce the noise impact due to utilising UAS with smaller noise signature, for search and rescue responses.

If this baseline system was retained, it is likely that the noise impact would increase having a negative impact on health, quality of life, and tranquillity.

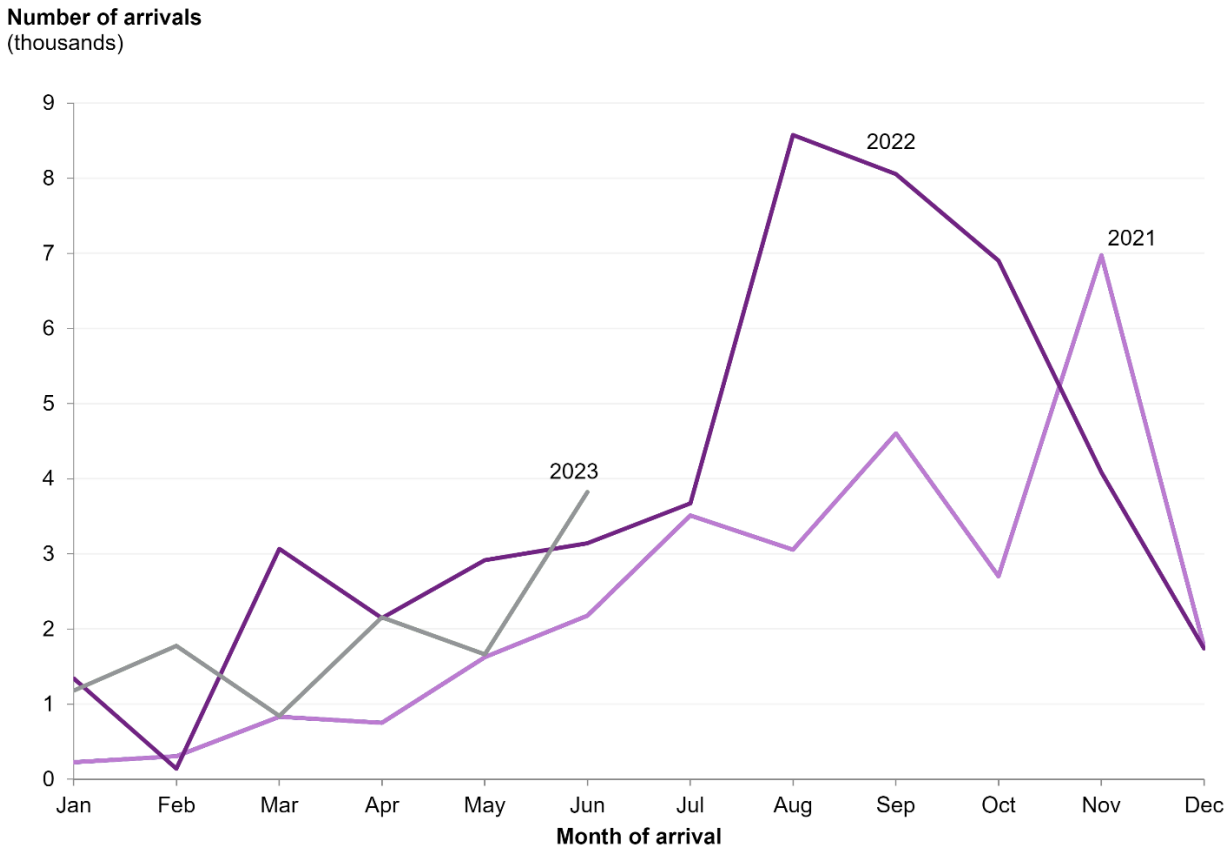


Figure 26: Number of people detected arriving in the UK via small boats per month, January 2021 to June 2023[1].

Communities	Air Quality	Qualitative
If this baseline was retained, air traffic in the channel would unlikely change flightpath below 2,500ft, however due to the increasing numbers of small boats, the corresponding response would require an increase in the number and duration of crewed search and rescue flights, consequently local air quality would deteriorate. There would be limited opportunity to improve the air quality due to utilising UAS with less CO2 emissions than crewed air assets for search and rescue responses.		

[1] Irregular migration to the UK, year ending June 2023 - GOV.UK (www.gov.uk)

Wider Society	Greenhouse gas impact	Qualitative
If this baseline was retained, air traffic in the channel would not change flightpath below 2,500ft, but due to the increasing numbers of small boats, the corresponding response would require increased numbers and duration of crewed search and rescue flights, consequently Greenhouse gas would increase. There would be limited opportunity to reduce Greenhouse gas due to the utilisation of UAS with less Greenhouse Gas emissions than crewed air assets for the small boat response.		
Wider Society	Capacity / resilience	Qualitative
If this baseline was retained, preventing the operation of UAS in the channel, the severe pressure on the crewed SAR helicopter operation at Lydd would continue, impacting service and crew availability and increasing risk to life of both helicopter crews and third parties requiring assistance. In the medium term this will likely result in the reduction in Search and Rescue capacity and resilience, due to the SAR Helicopters severe workload arising from the number of small boat incidents.		
General Aviation	Access	Qualitative
If this baseline was retained, GA would continue to access the same areas in a similar manner.		
General Aviation / Commercial airlines	Economic impact from increased effective capacity	Qualitative
If the baseline was retained, it is unlikely to increase effective capacity, and may result in a reduction given increased activity as a result of the increasing numbers of persons crossing the channel in small boats.		
General Aviation / Commercial airlines	Fuel Burn	Qualitative
If the baseline was retained, it is unlikely to change flight paths, and altitudes and therefore fuel burn impacts would be unlikely to change for GA or commercial operators.		
Commercial Airlines	Training costs	Qualitative
If the baseline was retained, there would be no change to training for commercial operators, as the same flight procedures would be used.		
Commercial airlines	Other costs	Qualitative
We are not aware of other commercial airline costs that are appropriate for inclusion in this appraisal. If this baseline was retained, those other costs would not change.		
Airport / Air navigation service provider	Infrastructure costs	Qualitative
The Lydd Airport infrastructure in place is used daily. If this baseline was retained, the same infrastructure would continue to be used in the same way, with no additional costs beyond typical maintenance.		
Airport / Air navigation service provider	Operational costs	Qualitative
The Lydd Airport operation is used daily. If this baseline was retained, the same operation would continue to be used in the same way, with no additional costs.		

Airport / Air navigation service provider	Deployment costs	Qualitative
If this baseline was retained, there would be no deployment, hence no associated costs.		

Qualitative Safety Assessment

A qualitative high-level safety appraisal for the Option 0 indicates that if the baseline was retained, the existing levels of safety would likely reduce across several areas:

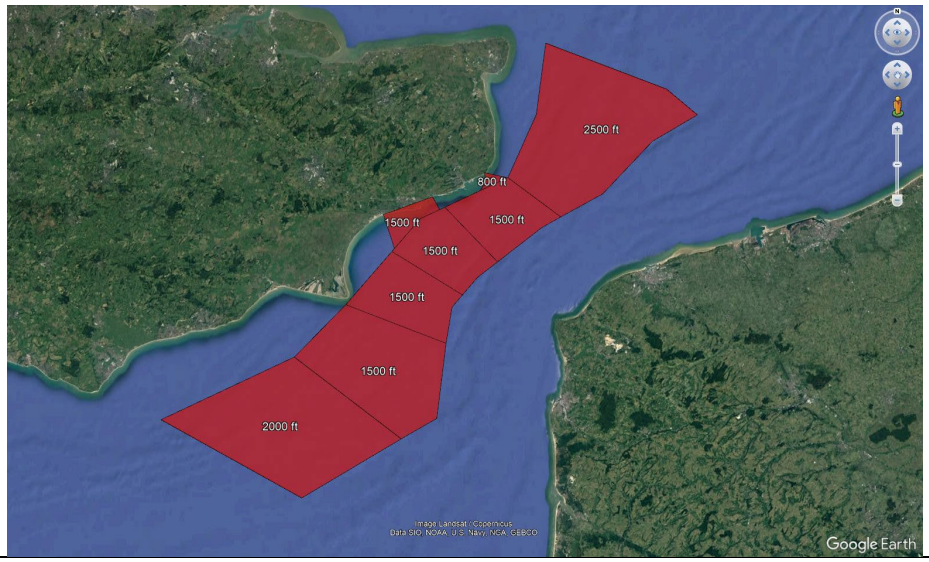
- The baseline prevents the operation of UAS in the channel. Consequently, the severe demand on the crewed SAR helicopter operation at Lydd would continue, this continued pressure reduces SAR crew availability, thereby increasing risk to life of helicopter crews, maritime first responders, and third parties requiring assistance.
- Increasing numbers of small boat crossings are forecast, and with it, HMG associated aircraft as part of the HMG response, leading to increased air traffic in both numbers of aircraft and flight patterns.

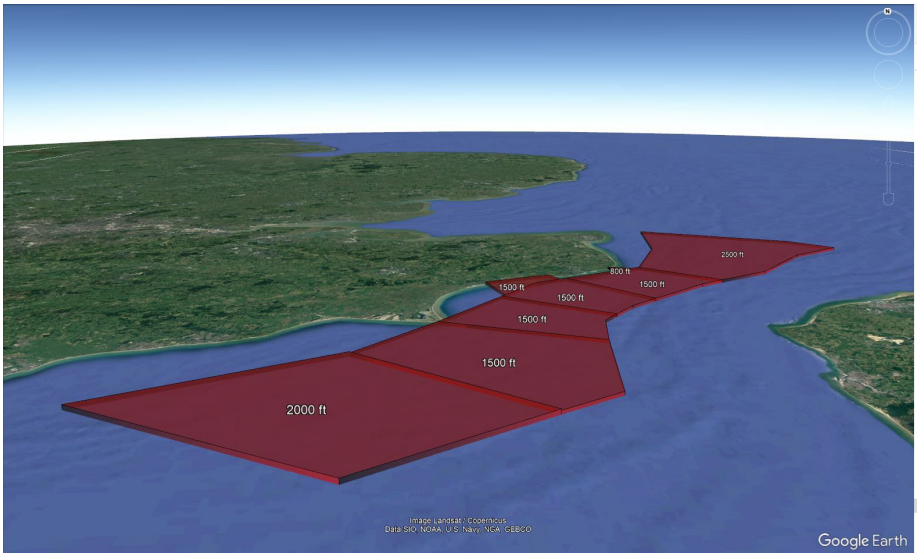
If there is no change to the current airspace construct, it is likely that the increased air traffic will place greater demand on aircrews operating in the Channel, and increased pressure on SAR responders will lead to potential safety issues in the future, whilst likely reducing successful outcomes for persons crossing the channel in small boats.

Options Under Assessment

Option 1A – Permanent Danger Area with DAAIS Only

Option Summary

Description:
• A permanent Danger Area (DA) established in Class G airspace, within the Channel. • The same volume of airspace as the totality of current Temporary Danger Area (TDA) D098 complex, both laterally and vertically, with some amendments to the individual TDAs that make up the complex (please see design section below). • The option includes a DAAIS only, and manged in the same way to the existing TDA D098 via NOTAM. [I.e. NOTAMed activity and DAAIS based simply on the NOTAMs. NOTAMs must be activated/deactivated with 24hr notice, with all the sectors speculatively activated each day and until their expiry regardless of UAS activity].
Design:
• The same lateral and vertical dimensions as TDA D098 complex (and as set in the images below). • Danger Area active up to 365 days a year, until no longer required. 



DAAIS

- DAAIS based on the active DA sectors in accordance with the activity set out within the daily NOTAM as currently.

Promulgation:

- Activated with minimum of 24 hours' notice and /deactivated when no longer required.
- Notification of the units providing the DAAIS contained within the NOTAM.

Airspace Management:

- DAAIS provided:
  - 0830 – 1900 daily: Lydd APP 120.705.
  - 1901 – 0829 daily: London FIR 124.6.
- All Operators (UAS and crewed) will need to notify Lydd ATC or London FIR dependent on time of day of the activity within the DA and work/monitor the RTF.

Coordination:

- Daily check on planned activity (as now) with PPR for Lydd based UAS and crewed SAR assets.
- Joint Rescue Coordination Centre (JRCC) will continue to coordinate taskings within Danger Area (as currently).
- All aircraft within DA will have to monitor the frequency of DAAIS service provider in line with time of day.
- 123.1 would still be the discreet frequency for UAS/UAS or UAS/SAR(H) / HMCG coordination / deconfliction, and in accordance with a deconfliction plan.
- GA Aircraft in distress (e.g., engine failure over Channel) given Cat A clearance priority, then SAR support.

Modifications:

- Lydd APP frequency Designated Operational Coverage (DOC) may need to increase to 40nm range to accommodate most Northerly and Southerly Danager Area sectors. It will be important to retain the existing frequency rather than an enforced channel change due to DOC requirements.

Resourcing:
• Existing Lydd ANSP Certification/Designation sufficient for task. • Existing London FIR ANSP Certification / Designation sufficient for task.

Impact Assessment

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life, and includes impact on tranquillity due to proximity to SSI and AONB.	Qualitative
Option 1A would enable the utilisation of UAS over crewed aircraft to undertake most of the tasks associated with HMG small boat response. The use of UAS with smaller mass, engine size will significantly reduce the noise impact over crewed alternatives. The segregated airspace volume is however likely to change the flight paths and altitudes of both General Aviation and Commercial Airline traffic vs Option 0 – Baseline, in certain conditions. Consequence a. Aircraft operating when cloud base is below the DA vertical limit (1500ft, 2000ft and 2500ft dependent on area) would need to increase their altitude to fly over the airspace volume. However, this may not be possible for VFR GA traffic who would need to change course to fly around the Danger Area. It is also less desirable for Helicopters which routinely operate closer to ground level. When cloud base is above the vertical limit aircraft could operate between the vertical limit of the airspace volume and the cloud base. Impact The impact on noise is that aircraft will likely operate higher reducing the impact of noise when operating in conditions where cloud base is less than 1500ft and 2000ft, or will need to alter route potentially transferring noise impact to areas adjacent to the airspace volume. The airspace volume is over the sea, any air traffic operating in this will generate a very limited Noise impact, with transits of these aircraft having an impact. The increasing numbers of persons crossing the channel in small boats forecast, will lead to an increase in HMG associated crewed aircraft, as part of the HMG small boat response. This will in turn lead to greater noise impact should crewed aircraft be utilised for these taskings as would be required under Option 0 – Baseline. Option 1A enables the utilisation of UAS with smaller noise impact, enabled by the segregated airspace volume, this would reduce the noise associated with crewed aircraft undertaking the same SAR and small boat tasks. However, there may be some transfer of noise impact in some area's vs baseline / option 0, due to GA traffic having to divert around the Danger area,		
Communities	Air Quality	Qualitative
Option 1A would enable the utilisation of UAS over crewed aircraft to undertake most of the tasks associated with HMG small boat response. The use of UAS with smaller mass, engine size and fuel burn rate will significantly reduce the emissions and air quality over crewed alternatives.		

The segregated airspace volume is however likely to change the flight paths and altitudes of both General Aviation and Commercial Airline traffic vs Option 0 – Baseline, in certain conditions.

Consequence

a. Aircraft operating when cloud base is below the DA vertical limit (1500ft, 2000ft and 2500ft dependent on area) would need to increase their altitude to fly over the airspace volume. However, this may not be possible for VFR GA traffic who would need to change course to fly around the Danger Area. It is also less desirable for Helicopters which routinely operate closer to ground level. When cloud base is above the vertical limit aircraft could operate between the vertical limit of the airspace volume and the cloud base.

Impact

The impact on air quality is that aircraft will likely operate higher reducing the impact of air quality when operating in conditions where cloud base is less than 1500ft and 2000ft, or will need to alter route, potentially transferring the impact of reduced air quality to areas adjacent to the airspace volume.

The airspace volume is over the sea, any air traffic operating in this will a very limited air quality impact, with transits of these aircraft having an impact.

The increasing numbers of persons crossing the channel in small boats forecast, will lead to an increase in HMG associated crewed aircraft, as part of the HMG small boat response. This will in turn lead to greater emissions should crewed aircraft be utilised for these taskings as would be required under Option 0 – Baseline. Option 1A enables the utilisation of UAS with significantly lower emissions, enabled by the segregated airspace volume. The Option 1A enables the use of utilising UAS enabled by the segregated airspace volume. UAS has significantly less emissions than crewed aircraft and therefore represent a reduced impact on air quality. However there may be some decrease in air quality in some areas vs baseline / option 0, due to GA traffic having to divert around the Danger area.

Wider Society	Greenhouse gas impact	Qualitative

Option 1A would enable the utilisation of UAS over crewed aircraft to undertake most of the tasks associated with HMG small boat response. The use of UAS with smaller mass, engine size and fuel burn rate will significantly reduce the CO2 emissions and Greenhouse gases over crewed alternatives.

The segregated airspace volume is however likely to change the flight paths and altitudes of both General Aviation and Commercial Airline traffic vs Option 0 – Baseline, in certain conditions.

Consequence

a. Aircraft operating when cloud base is below the DA vertical limit (1500ft, 2000ft and 2500ft dependent on area) would need to increase their altitude to fly over the airspace volume. However, this may not be possible for VFR GA traffic who would need to change course to fly around the Danger Area. It is also less desirable for Helicopters which routinely operate closer to ground level. When cloud base is above the vertical limit aircraft could operate between the vertical limit of the airspace volume and the cloud base.

Impact

When only a DAAIS is available, aircraft will likely operate at higher altitudes when operating in conditions where cloud base is less than 1500ft and 2000ft, which will have limited impact on greenhouse gases. Alternatively, aircraft will need to alter route likely increasing and transferring greenhouse gases to areas adjacent to the airspace volume.

The airspace volume is over the sea, any air traffic operating in this will produce similar greenhouse gases as the baseline.

The increasing numbers of persons crossing the channel in small boats forecast, will lead to an increase in HMG associated crewed aircraft, as part of the HMG small boat response. This will in turn lead to increased greenhouse gases should crewed aircraft be utilised for these taskings as would be required under Option 0 – Baseline. Option 1A enables the utilisation of UAS with less greenhouse gases produced, enabled by the segregated airspace volume, this would reduce greenhouse gas impact verse crewed aircraft undertaking the same SAR and small boat tasks. However, there may be some increase in greenhouse gases in some areas vs baseline / option 0, due to GA traffic having to divert around the Danger area,		
Wider Society	Capacity / resilience	Qualitative
Option 1A would likely reduce the capacity of VFR GA traffic to transit across the Channel when cloud base is less than the vertical limits of the segregated airspace. GA traffic can find an alternative route around the segregated airspace, although this alternative route is likely to be substantially longer at times. This option enables the operation of UAS in the channel, the severe pressure on the crewed SAR helicopter operation at Lydd would reduce, improving service and crew availability and reducing risk to life of both helicopter crews and third parties requiring assistance. In the medium term this will likely result in the increase in Search and Rescue capacity and resilience, due to the corresponding decrease in SAR Helicopters workload. Limited impact on commercial airline traffic capacity is foreseen as they can operate over the segregated airspace due to aircraft ratings and pilot licensing.		
General Aviation	Access	Qualitative
Option 1A would likely reduce the access of VFR GA traffic to transit across the Channel when cloud base is less than the vertical limits of the segregated airspace. GA traffic can find an alternative route around the segregated airspace, although this alternative route is likely to be substantially longer at times.		
General Aviation / Commercial airlines	Economic impact from increased effective capacity	Qualitative
Option 1A would likely reduce the effective capacity of VFR GA traffic to transit across the Channel when cloud base is less than the vertical limits of the segregated airspace. GA traffic can find an alternative route around the segregated airspace, although this alternative route is likely to be substantially longer at times. It is unlikely the effective capacity for Commercial Airlines will be impacted significantly. The economic impact is likely to be primarily linked to any requirements to transit around the segregated airspace and the increased fuel burn and therefore costs for these additional distances.		
General Aviation / Commercial airlines	Fuel Burn	Qualitative
Option 1A would likely see an increased fuel burn from GA, where aircraft are crossing the channel under VFR, the DA is active, and the cloud base is lower than the vertical limits of the segregated airspace. This is due to GA traffic requiring to take an alternative route around the segregated airspace and hence additional distance travelled and therefore fuel consumption. Option 1A would likely result in marginal impact on the fuel burn of Commercial Airlines crossing the channel, who due to operational authorities could increase altitude and fly over the vertical limits of the segregated airspace, without altering course significantly and therefore increasing fuel burn rates.		
Commercial Airlines	Training costs	Qualitative

If Option 1A is progressed, there would be no change to training for commercial operators, as the same flight procedures would be used. Specifically, this would be for aircraft operators to check NOTAMS before and during flight, and if the segregated airspace volume (DA) is active ensure the aircraft transits outside of this volume.		
Commercial airlines	Other costs	Qualitative
We are not aware of other commercial airline costs that are appropriate for inclusion in this appraisal.		
Airport / Air navigation service provider	Infrastructure costs	Qualitative
The Lydd Airport infrastructure is used daily. If Option 1A was progressed, the same operation would continue to be used in the same way, with limited additional costs other than lose related to enhancing DOC if required.		
Airport / Air navigation service provider	Operational costs	Qualitative
The Lydd Airport operation is used daily. If Option 1A was progressed, the same operation would continue to be used in the same way, with limited additional costs.		
Airport / Air navigation service provider	Deployment costs	Qualitative
If Option 1A progressed, there would be no deployment required as an ongoing provision is currently in place and hence limited additional costs.		

Qualitative Safety Assessment
It is challenging to compare the safety assessment between Option 0 and Option 1A, as fundamentally they do not enable the same aircraft activity in the channel airspace. Option 0 – does not enable crewed and UAS operations, whereas Option 1A does. The Option 0 – Baseline does not allow the utilisation of UAS and crewed in the Channel as it does not comply with CAA UAS regulatory requirements, a key element is based on safety. Therefore, if comparing the ability to enable UAS and crewed operations in the Channel, Option 1A is safer as it segregates UAS activity to a specific airspace volume. Furthermore, as the majority of the UAS activity eliminates a significant proportion of the Helicopter Search and Rescue activity and other HMG Aircraft activity required in the HMG Small Boat response, it therefore increases safety of crewed aircraft operators (1st party risk) as they able to be held in standby for Search and Rescue taskings which require a crewed helicopter. The activity undertaken by the UAS has the aim of reducing risk to life and improving rescue outcomes in the Channel area of operations whilst providing opportunity to reduce the pressure on the SAR helicopter service.

Option 1B – Permanent Danger Area with DAAIS / DACS.

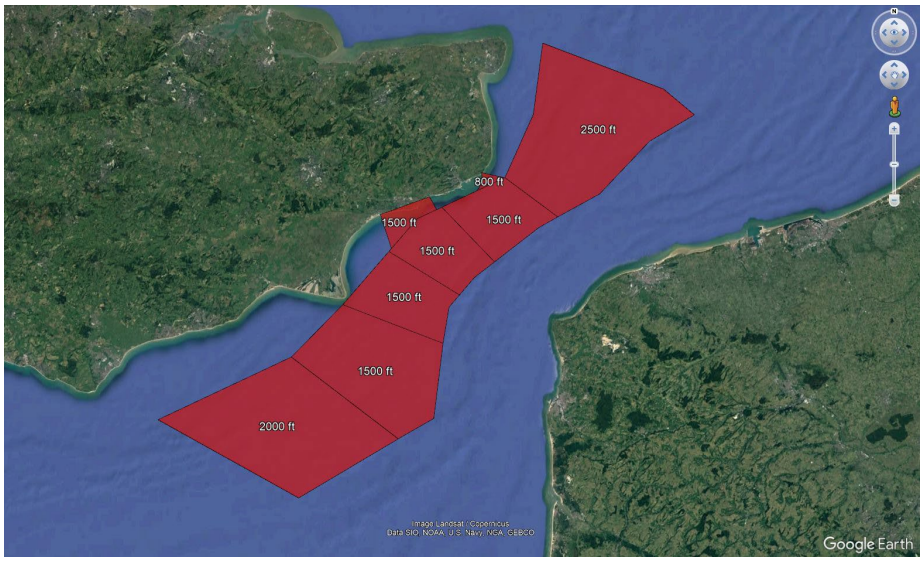
Option Summary

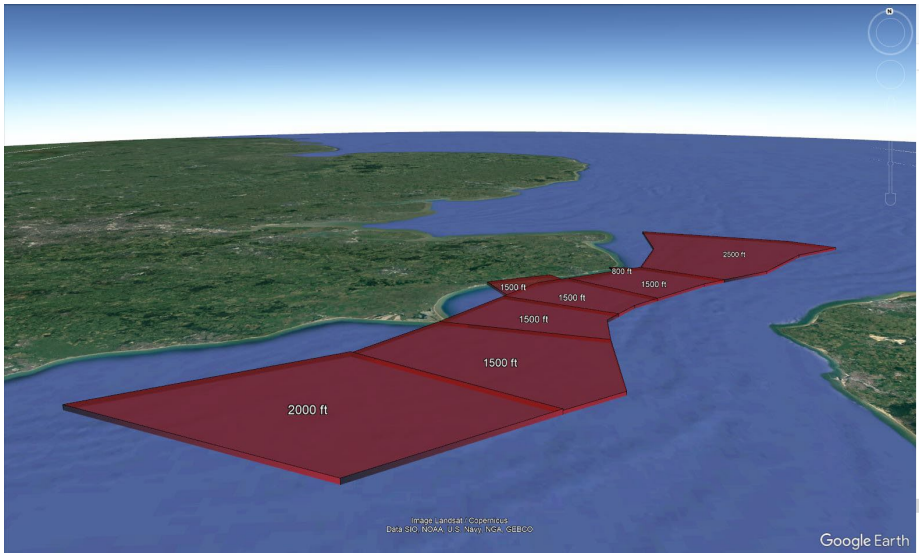
Description:
• A permanent DA established in Class G airspace, within the Channel.

- The same volume of airspace as the totality of TDA D098 complex, both laterally and vertically, with some amendments to the individual DAs that make up the complex (please see design section below).
- The option includes a DAAIS / DACS to allow greater permeability for low level GA crossing under certain conditions.

Design:

- The same lateral and vertical dimensions as TDA D098 complex (and as set in the images below)
- Danger Area active 365 days a year, until no longer required.





DAAIS/DACS

- DAAIS / DACS, based on the Danger Area sectors in accordance with the actual UAS activity, per sector, rather than the NOTAM activity as currently. With the DAAIS always available when the DA is active and DACS available only during Lydd Airport opening times.

• This would enable a General Aviation crossing of an inactive sector (not currently occupied by the UAS).
Promulgation:
• H24/7/365 rather than activated /deactivated by NOTAM. • Notification of the DAAIS /DACS Units within a note on the charted DA. • Permanent charting will enable feed through to electronic flight mapping devices, for example, enabling improved flight planning. • This will reduce confusion over the activity, but the DAAIS / DACS enables flexible use of the airspace by all whilst facilitating more flexible UAS operations rather than to a pre-determined schedule.
Airspace Management:

• Basic Service (FIS) on Lydd APP 120.705 min equipment 2-way RTF.
  • 0830 – 1900 daily: Lydd APP 120.705.
  • 1901 – 0829 daily: London FIR 124.6.
• All Operators (UAS and crewed) will need to notify Lydd ATC or London FIR dependent on time of day of the activity within the DA and work/monitor the RTF.
• Lydd will keep movement data on flight progress strips to assist with ATS management. This includes the Tekever AR3 at Swingfield, so all traffic using the DA is known to Lydd.
• Electronic Conspicuity maybe useful to assist and facilitate airspace controllers with situational awareness.
• Promulgated H24 and charted, therefore no activated / deactivated by NOTAM, but instead actively managed in real-time through improved coordination of UAS operators with DAAIS / DACS Air Traffic Units and better use of DA segments to facilitate crossings when segment is known to be inactive by direct RTF or phone coordination with UAS operators and HMG Small Boats Command.

Coordination:
• Daily check on planned activity (as now) with PPR for Lydd based UAS and manned SAR assets. • JRCC (ARCC) will continue to coordinate taskings within Danger Area (as currently). • All aircraft within DA will have to monitor the frequency of service provider in line with time of day. • 123.1 would still be the discreet frequency for UAS/UAS or UAS/SAR(H) / HMCG coordination / deconfliction, and in accordance with deconfliction plan. • GA aircraft requesting transit of Danger Area will make request on Lydd APP. Lydd Controller will check position of the various UAS by sector and intentions. If inactive a sector will be made available for GA crossing, then this can be accommodated providing the higher priority SOLAS UAS or SAR(H) flight is not impeded. • GA Aircraft in distress (e.g., engine failure over Channel) given Cat A clearance priority, then SAR support.
Modifications:
• Lydd APP frequency Designated Operational Coverage (DOC) may need to increase to 40nm range to accommodate sector E. Important to retain existing frequency rather than an enforced channel change due to DOC requirements. • ADS-B – not essential for DAAIS as described above but will enhance SA and improve airspace management. • VHF direction finder will need to be reinstated to improve situational awareness for airspace management purposes. • MATS2 update will be required, but procedures similar to D044/D141.
Resourcing:
• Existing Lydd ANSP Certification/Designation sufficient for task. • Existing London FIR ANSP Certification/Designation sufficient for task.

- Additional workload created by Danger Area airspace management would be mitigated by improved VHF DF and ADSB-FID by improving Controller situational awareness of traffic transiting English Channel.

Impact Assessment

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life, and includes impact on tranquillity due to proximity to SSI and AONB.	Qualitative
Option 1B would enable the utilisation of UAS over crewed aircraft to undertake many tasks associated with HMG small boat response. The use of UAS with smaller mass, engine size will significantly reduce the noise impact over crewed alternatives. The segregated airspace volume is however likely to change the flight paths and altitudes of both General Aviation and Commercial Airline traffic vs Option 0 – Baseline, in certain conditions. Consequence a. Aircraft operating when cloud base is below the DA vertical limit (1500ft, 2000ft and 2500ft dependent on area) when the DAAIS / DACS is provided, could request a crossing service, and follow instructions to cross the DA. Impact When a DAAIS/DACS is available aircraft will likely transit through the DA at similar altitudes and course as if the DA was not active, thereby little noise variance should the aircraft transit through class G airspace without the DA. The airspace volume is over the sea, any air traffic operating in this will generate a very limited Noise impact, with transits of these aircraft having an impact. The increasing numbers of persons crossing the channel in small boats. forecast, will lead to an increase in HMG associated crewed aircraft, as part of the HMG small boat response. This will in turn lead to greater noise impact should crewed aircraft be utilised for these taskings as would be required under Option 0 – Baseline. Option 1B enables the utilisation of UAS with smaller noise impact, enabled by the segregated airspace volume, this would reduce the noise associated verse crewed aircraft undertaking the same SAR and small boat tasks. As GA and Commercial traffic will be able to transit through the DA, there would be no significant change to noise impact from baseline / Option 0, as limited diversions around the DA would be required.		
Communities	Air Quality	Qualitative
Option 1B would enable the utilisation of UAS over crewed aircraft to undertake many of the tasks associated with HMG small boat response. The use of UAS with smaller mass, engine size and fuel burn rate will significantly reduce the air quality impact over crewed alternatives. The segregated airspace volume is however likely to change the flight paths and altitudes of both General Aviation and Commercial Airline traffic vs Option 0 – Baseline, in certain conditions. Consequence		

a. Aircraft operating when cloud base is below the DA vertical limit (1500ft, 2000ft and 2500ft dependent on area) when the DAAIS / DACS is provided, could request a crossing service, and follow instructions to cross the DA.

Impact

The impact on air quality when a DAAIS / DACS is available is that aircraft will likely transit through the DA at similar altitudes and course as if the DA was not active, thereby the impact will be neutral.

The airspace volume is over the sea, any air traffic operating in this will reduce air quality, with transits of these aircraft having an impact.

The increasing numbers of persons crossing the channel in small boats. forecast, will lead to an increase in HMG associated crewed aircraft, as part of the HMG small boat response. This will in turn lead to greater emissions should crewed aircraft be utilised for these taskings as would be required under Option 0 – Baseline. Option 1B enables the utilisation of UAS with significantly lower emissions, enabled by the segregated airspace volume. The Option 1B enables the use of utilising UAS enabled by the segregated airspace volume. UAS has significantly less emissions than crewed aircraft and therefore represent a reduced impact on air quality. As GA and Commercial traffic will be able to transit through the DA, there would be no significant change to air quality from baseline / Option 0, as limited diversions around the DA would be required.

Wider Society	Greenhouse gas impact	Qualitative

Option 1B would enable the utilisation of UAS over crewed aircraft to undertake many of the tasks associated with HMG small boat response. The use of UAS with smaller mass, engine size and fuel burn rate will significantly reduce the CO2 emissions and Greenhouse gases over crewed alternatives.

The segregated airspace volume is however likely to change the flight paths and altitudes of both General Aviation and Commercial Airline traffic vs Option 0 – Baseline, in certain conditions.

Consequence

a. Aircraft operating when cloud base is below the DA vertical limit (1500ft, 2000ft and 2500ft dependent on area) when the DAAIS / DACS is provided, could request a crossing service, and follow instructions to cross the DA.

Impact

When a DAAIS / DACS is available, aircraft will likely transit through the DA at similar altitudes and course as if the DA was not active, thereby creating little greenhouse gas impact verse aircraft transiting through Class G airspace without the DA.

The airspace volume is over the sea, any air traffic operating in this will produce similar greenhouse gases as the baseline.

The increasing numbers of persons crossing the channel in small boats. forecast, will lead to an increase in HMG associated crewed aircraft, as part of the HMG small boat response. This will in turn lead to increased greenhouse gases should crewed aircraft be utilised for these taskings as would be required under Option 0 – Baseline. Option 1B enables the utilisation of UAS with less greenhouse gases produced, enabled by the segregated airspace volume, this would reduce greenhouse gas impact verse crewed aircraft undertaking the same SAR and small boat tasks. As GA and Commercial traffic will be able to transit through the DA, there would be no significant change to greenhouses from baseline / Option 0, as limited diversions around the DA would be required.

Wider Society	Capacity / resilience	Qualitative

When a DAAIS / DACS is available GA traffic would be able to cross the DA with minimal impact.

This option enables the operation of UAS in the channel, the severe pressure on the crewed SAR helicopter operation at Lydd would reduce, improving service and crew availability and reducing risk to life of both helicopter crews and third parties requiring assistance. In the medium term this will likely result in the increase in Search and Rescue capacity and resilience, due to the corresponding decrease in SAR Helicopters workload. Limited impact on commercial airline traffic capacity is foreseen as they can operate over the segregated airspace due to aircraft ratings and pilot licensing.		
General Aviation	Access	Qualitative
When a DAAIS / DACS is available GA traffic would be able to request a crossing service and cross the DA. In poorer conditions where low cloud / high winds / precipitation are present small boat crossings are unlikely, therefore the UAS will not be operating. The result being that GA are likely to be able to transit the DA at low levels as they will be forced to descend to maintain VFR.		
General Aviation / Commercial airlines	Economic impact from increased effective capacity	Qualitative
When a DAAIS / DACS is available GA traffic and Commercial Airlines would be able to request a crossing service and cross the DA, and hence increase effective capacity of the airspace. The negative economic impact is likely to be primarily linked to any requirements to transit around the segregated airspace and the increased fuel burn for these additional distances, for GA traffic when cloud base is less than the vertical limits of the DA and a DAAIS / DACS is not available.		
General Aviation / Commercial airlines	Fuel Burn	Qualitative
Option 1B would likely see marginal impact on Commercial Airlines fuel burn aircraft are crossing the channel could increase altitude and fly over the vertical limits of the segregated airspace. When a DAAIS / DACS is available GA traffic and Commercial Airlines would be able to request a crossing service and cross the DA and would have little to no impact on fuel burn rates.		
Commercial Airlines	Training costs	Qualitative
If Option 1B is progressed, there would be no change to training for commercial operators, as the same flight procedures would be used.		
Commercial airlines	Other costs	Qualitative
We are not aware of other commercial airline costs that are appropriate for inclusion in this appraisal.		
Airport / Air navigation service provider	Infrastructure costs	Qualitative
The Lydd Airport infrastructure is used daily. If Option 1B was progressed, the same operation would continue, with the additional costs relating to the provision of a DACS at certain times of the day. Some additional costs may arise with the installation of ADSB-FID and VHF Direction Finding.		
Airport / Air navigation service provider	Operational costs	Qualitative

The Lydd Airport infrastructure is used daily. If Option 1B was progressed, the same operation would continue, with the additional costs relating to the provision of a DAAIS / DACS at certain times of the day.		
Airport / Air navigation service provider	Deployment costs	Qualitative
If Option 1B progressed, there would be no deployment required as an ongoing provision is currently in place and hence limited additional costs.		

Qualitative Safety Assessment
It is challenging to compare the safety assessment between Option 0 and Option 1B, as fundamentally they do not enable the same aircraft activity in the Channel. Option 0 – does not enable crewed and UAS operations, whereas Option 1B does. The Option 0 – Baseline does not allow the utilisation of UAS and crewed in the Channel as it does not comply with CAA UAS regulatory requirements, a key element is based on a lack of safety. Therefore, if comparing the ability to enable UAS and crewed operations in the Channel Option 1B is safer as it segregates UAS activity to a specific airspace volume, whilst also providing the ability of Crewed aircraft to cross the segregated airspace in a controlled manner. This differs from Option 1A which although enables the utilisation of UAS it does not enable air traffic to cross the DA. Furthermore, as the majority of the UAS activity eliminates the need for the same activity to be conducted by crewed aviation, it increases safety of crewed aircraft operators (1st party risk) as they are not flying. The activity undertaken by the UAS has the aim of reducing the risk to life of persons crossing the channel in small boats.

Conclusions

The airspace change process started in 2019 at Stage 1 with a Statement of Need, continuing with the development of Design Principles (DPs) via stakeholder engagement, and progressed through the CAA's regulatory Stage 1 Gateway Assessment.

In Stage 2 airspace design options were created, described, engaged upon (Step 2Ai) and formally evaluated against the DPs (Step 2Aii). The two design options progressed to Step 2Aii were subjected to a qualitative Initial Options Appraisal (Step 2B) including an assessment of safety considerations which is set out within this document.

This initial options appraisal does not consider exact details and combinations of design options that may when organised into systems lead to a design that minimises impact on stakeholders whilst enabling the delivery of the airspace to meet the statement of need. Subject to passing the Stage 2 Gateway Assessment, this proposal will move on to Stage 3 Consult.

Stage 3 will involve significant preparation, development, collaboration, and coordination as well as further stakeholder engagement. Appropriate quantitative assessments will be carried out as part of Stage 3, and these will be monetised where possible, and will include a cost-benefit analysis.

The Initial Options Appraisal has demonstrated that there are key differences between options 1A and 1B in terms of the benefits and impacts, and it would be valuable to analyse both in detail once the options have been developed in detail. We have therefore chosen to take both options forward to the full options appraisal (Stage 3a).

Throughout the initial options appraisal we have indicated where we will build upon the qualitative assessment to quantitively evidence potential benefits and impacts in the Full Options Appraisal. The quantified evidence, which will be collected against each category where appropriate, will also allow us to undertake analysis to provide a monetised assessment of the options.

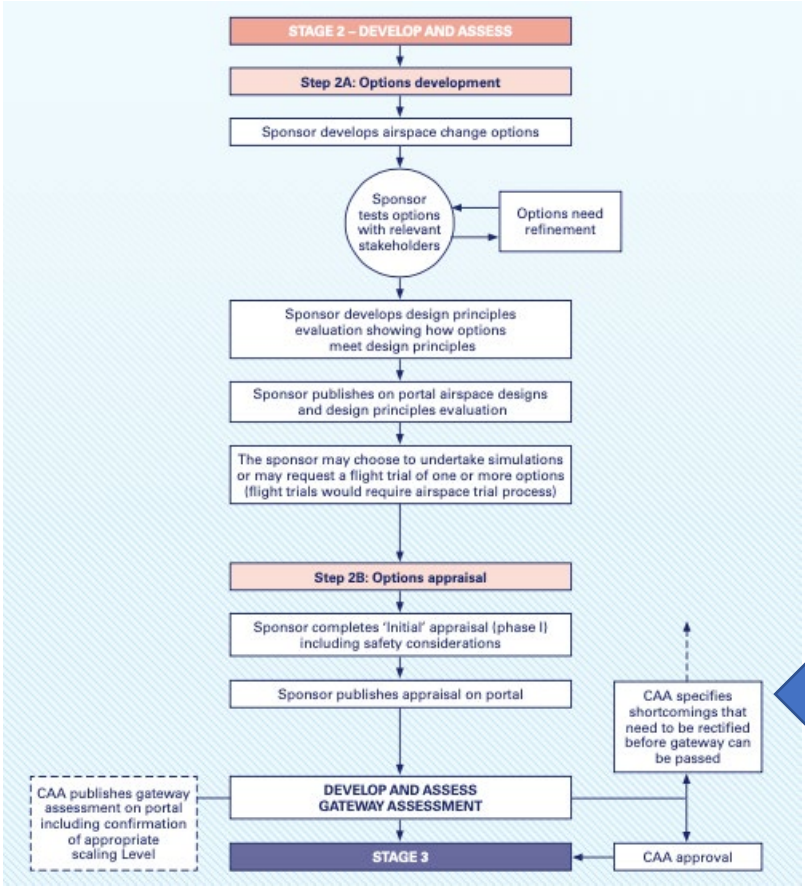
Preferred Option

As part of CAP1616, BHL on behalf of the MCA is required to state the preferred option following the initial options appraisal. At this stage, the preferred option is Option 1B Permanent Danger Area with DAAIS / DACS. In principle this option over the others enables both crewed and uncrewed aircraft to operate in a safe manner that meets the CAA regulatory requirements and limits the negative impact on affected parties. The benefits and impacts of these options will be further appraised at Stage 3 where, after the Full Options Appraisal outcomes, we will have another opportunity to state our preferred option before consultation begins.

Next Steps

This Initial Options Appraisal will be submitted to the CAA for a Develop and Assess Gateway on 28 April 2023. If successful, this ACP will move onto Stage 3 of the 7-Stage CAP1616 process, Consult. This document has been submitted to the CAA and published on the airspace change portal.

During Stage 3A a Full Options Appraisal on the options which have progressed from this IOA. We will also plan the consultation for this airspace change and draft a consultation strategy and consultation documents in advance of the next CAA Gateway 'Consult' in January 2024. Following a successful outcome at that assessment, BHL aim to begin a formal consultation with stakeholders on this proposal in Early 2024.


STAGE 2 – DEVELOP AND ASSESS
Step 2A: Options development
Sponsor develops airspace change options
Sponsor tests options with relevant stakeholders
Options need refinement
Sponsor develops design principles evaluation showing how options meet design principles
Sponsor publishes on portal airspace designs and design principles evaluation
The sponsor may choose to undertake simulations or may request a flight trial of one or more options (flight trials would require airspace trial process)
Step 2B: Options appraisal
Sponsor completes 'Initial' appraisal (phase I) including safety considerations
Sponsor publishes appraisal on portal
CAA specifies shortcomings that need to be rectified before gateway can be passed
CAA publishes gateway assessment on portal including confirmation of appropriate scaling Level
DEVELOP AND ASSESS GATEWAY ASSESSMENT
STAGE 3
CAA approval

We are here.

Maritime & Coastguard Agency

Bristow Search and Rescue

Annex A – Approved Design Principles

Reference	Category (CAP1616)	Design Principle	Priority
DP1	Safety	Maintain or enhance current levels of safety.	1
DP2	Operational / Technical	Consider the requirements of all potential users.	2
DP3	Operational / Economic	Minimise the impact on other airspace users.	3
DP4	Policy / regulatory	Comply with UAS regulatory framework.	4
DP5	Operational / Technical	Operating area to be located over the sea.	5
DP6	Environmental / Operational	Minimise the noise and environmental impact on areas affected by the proposed change.	6

Table 1: Approved Design Principles from Stage 1.

TARGET ZERO
The Bristow Group Culture of Safety

Maritime & Coastguard Agency

Bristow Search and Rescue

Annex B – Aircraft Traffic and Aircraft Density in 2019.

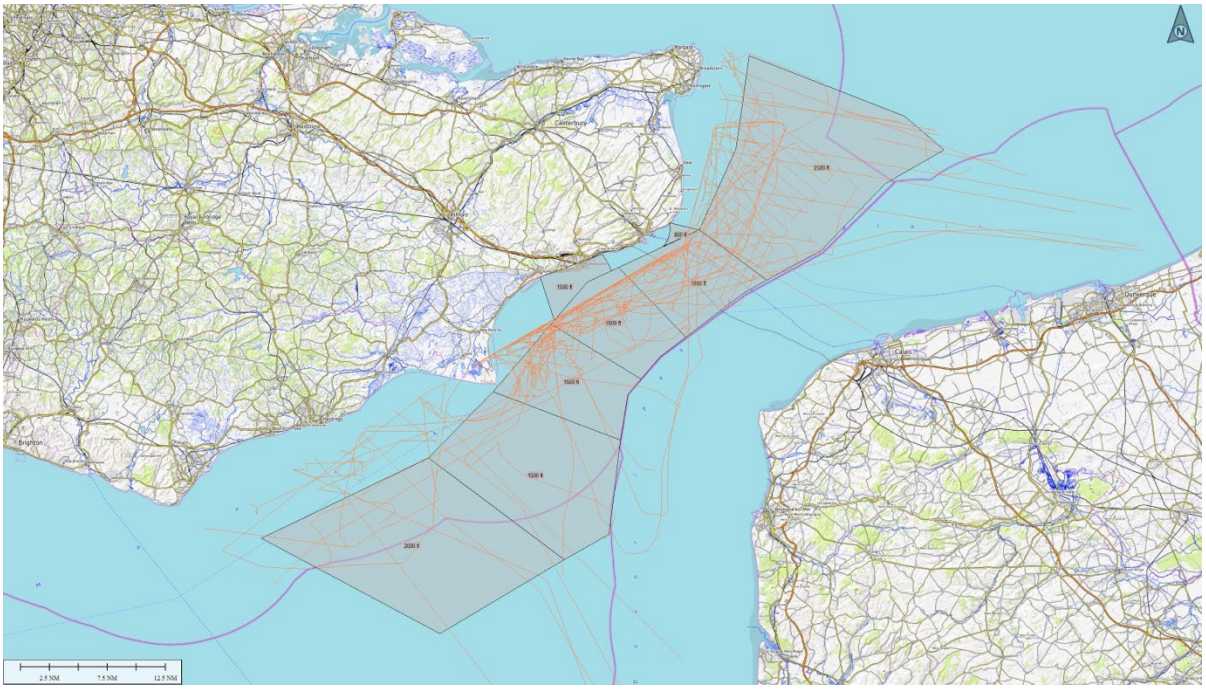


Figure 1: January 2019 – Aircraft traffic.

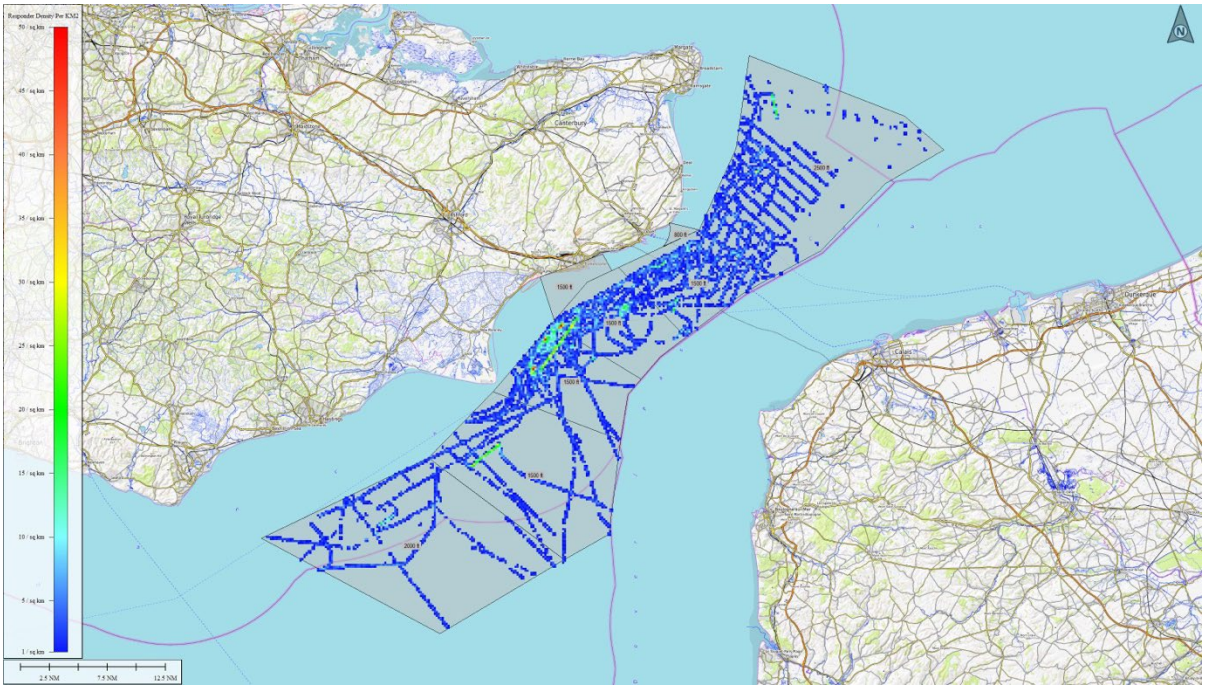


Figure 2: January 2019 – Aircraft density.

TARGET ZERO
The Bristow Group Culture of Safety

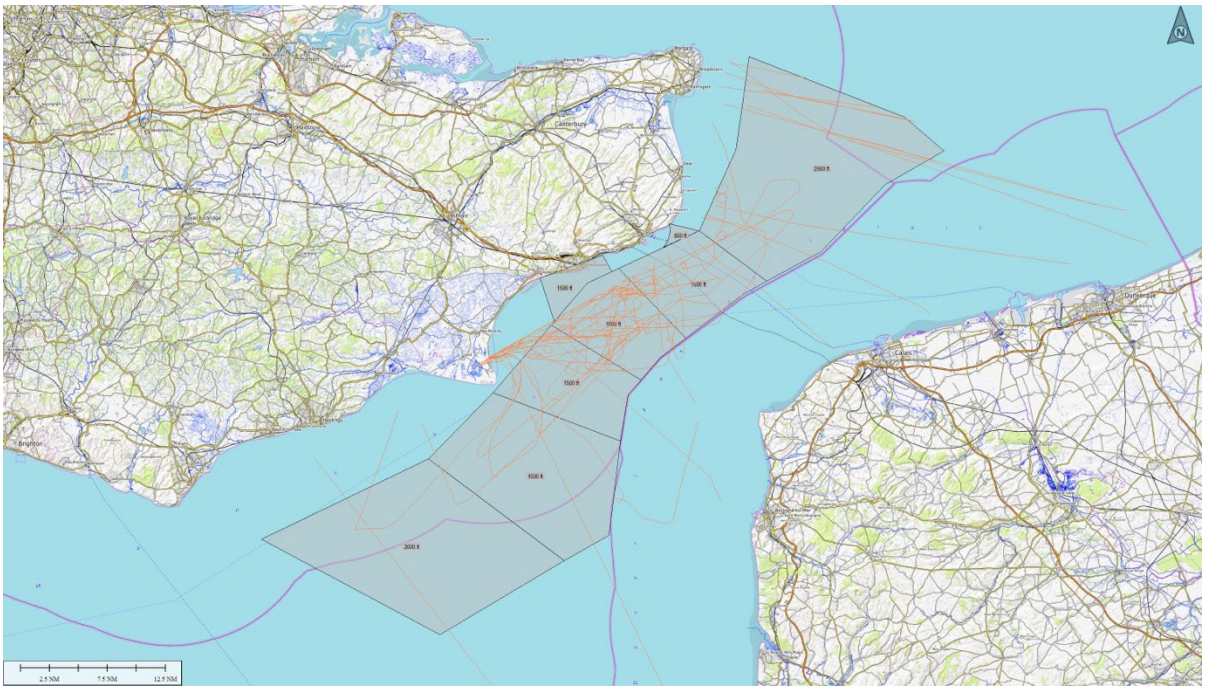


Figure 3: February 2019 – Aircraft traffic.

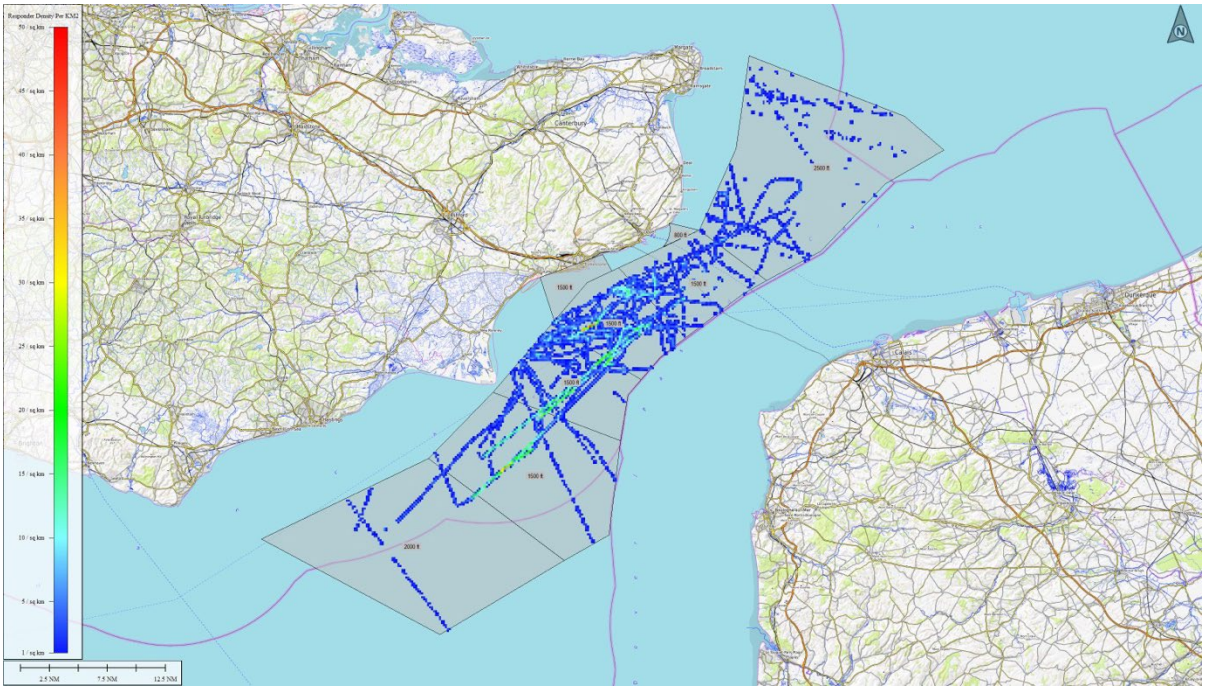


Figure 4: February 2019 – Aircraft density.

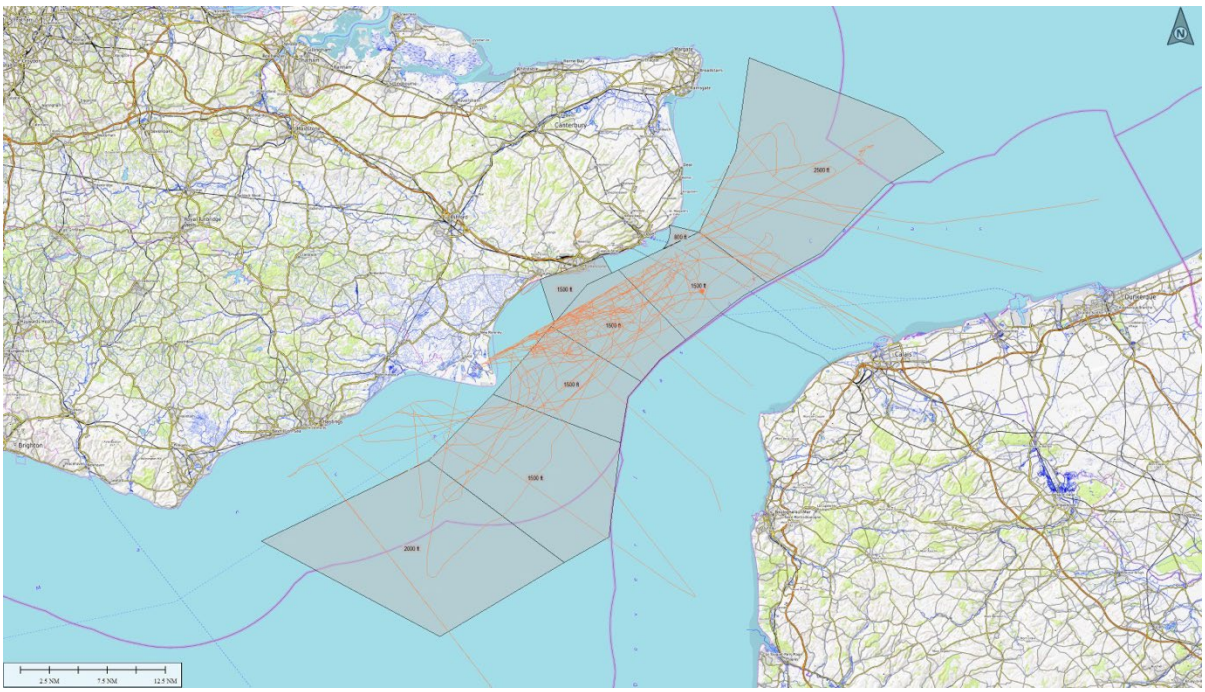


Figure 5: March 2019 – Aircraft traffic.

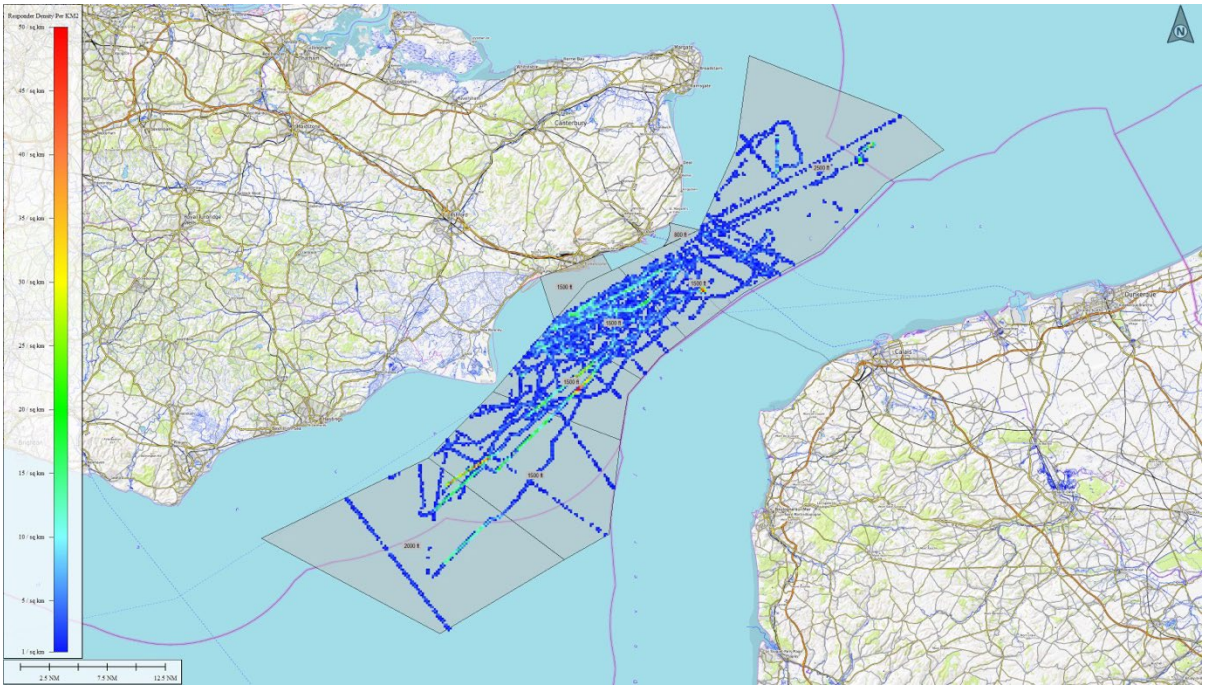


Figure 6: March 2019 – Aircraft density.

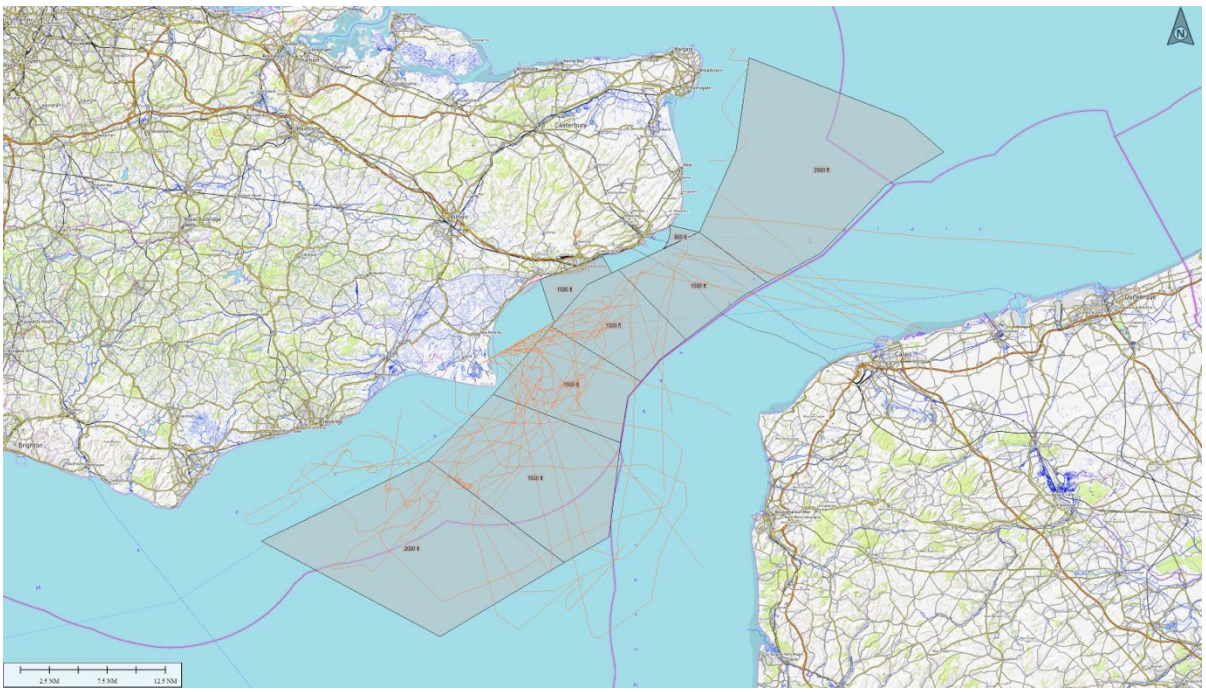


Figure 7: April 2019 – Aircraft traffic.

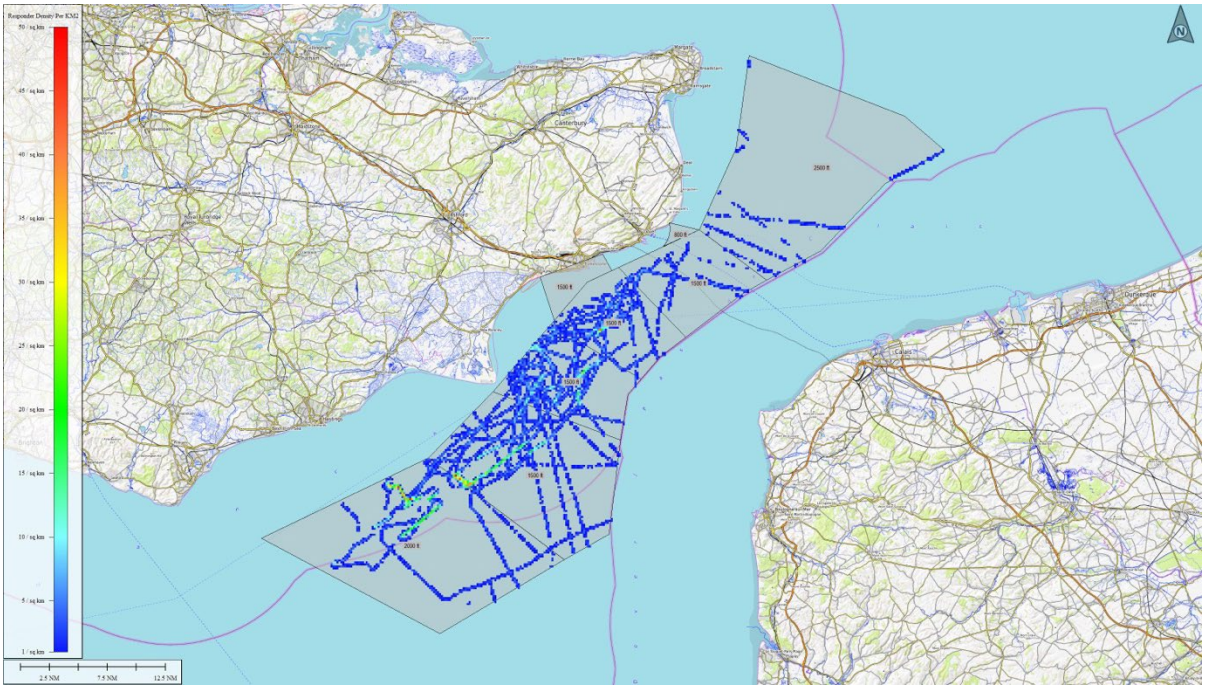


Figure 8: April 2019 – Aircraft density.

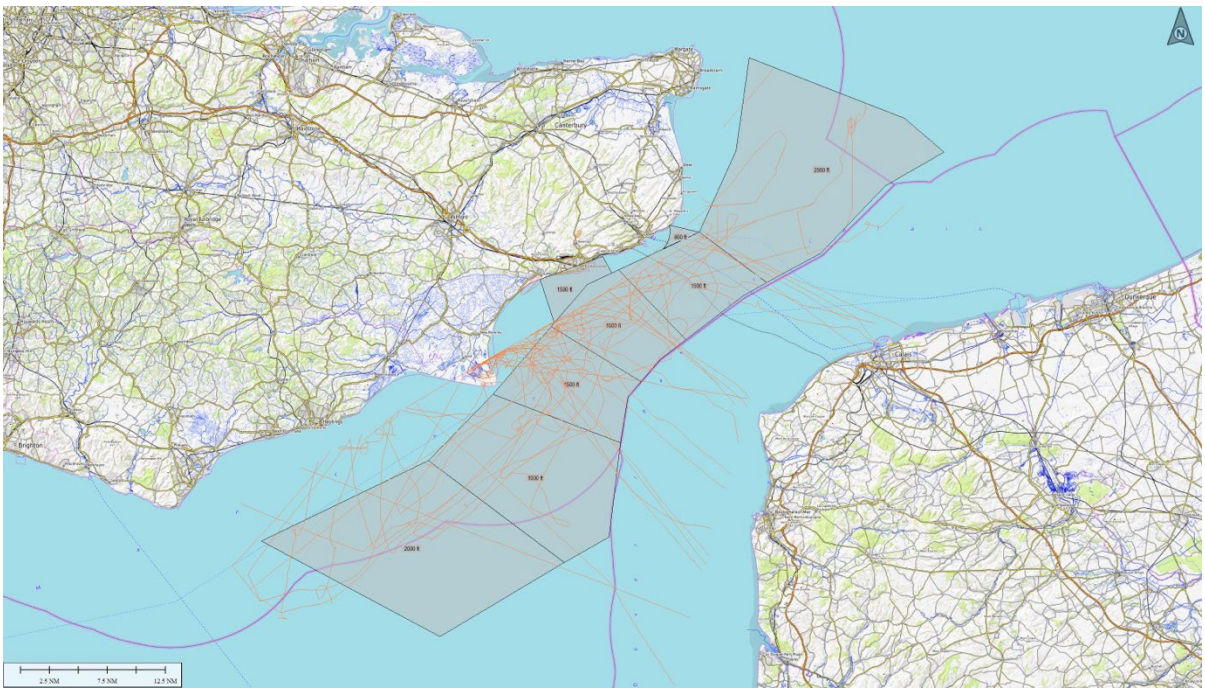


Figure 9: May 2019 – Aircraft traffic.

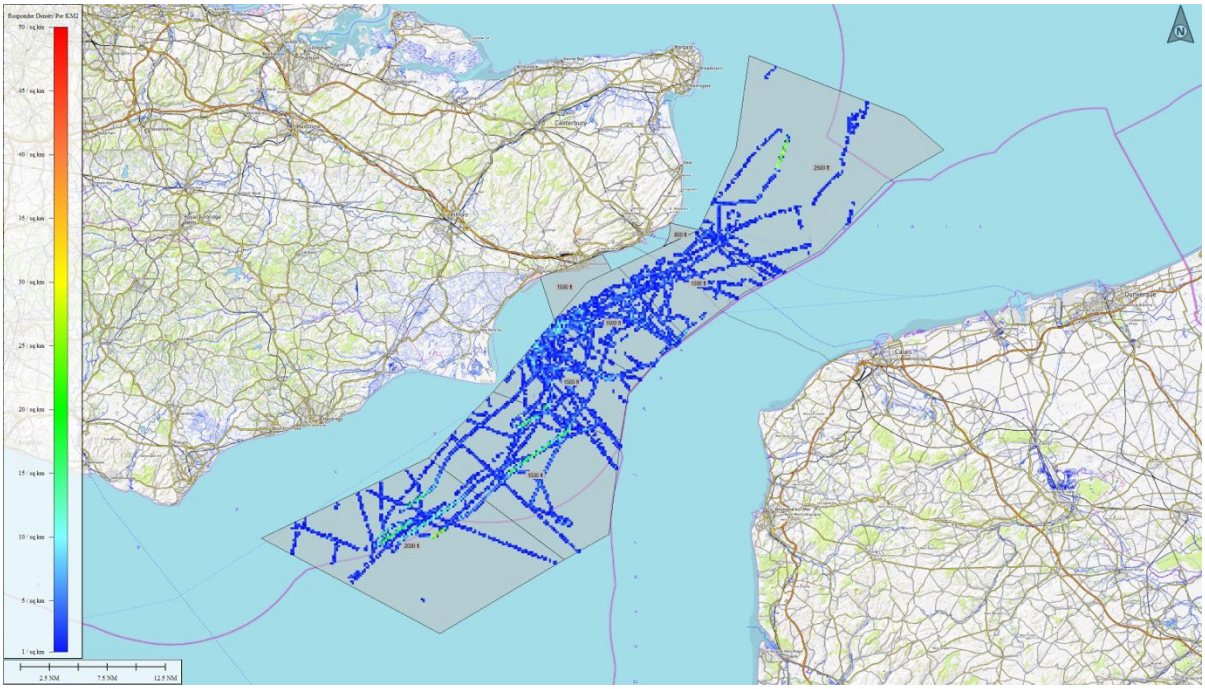


Figure 10: May 2019 – Aircraft density.

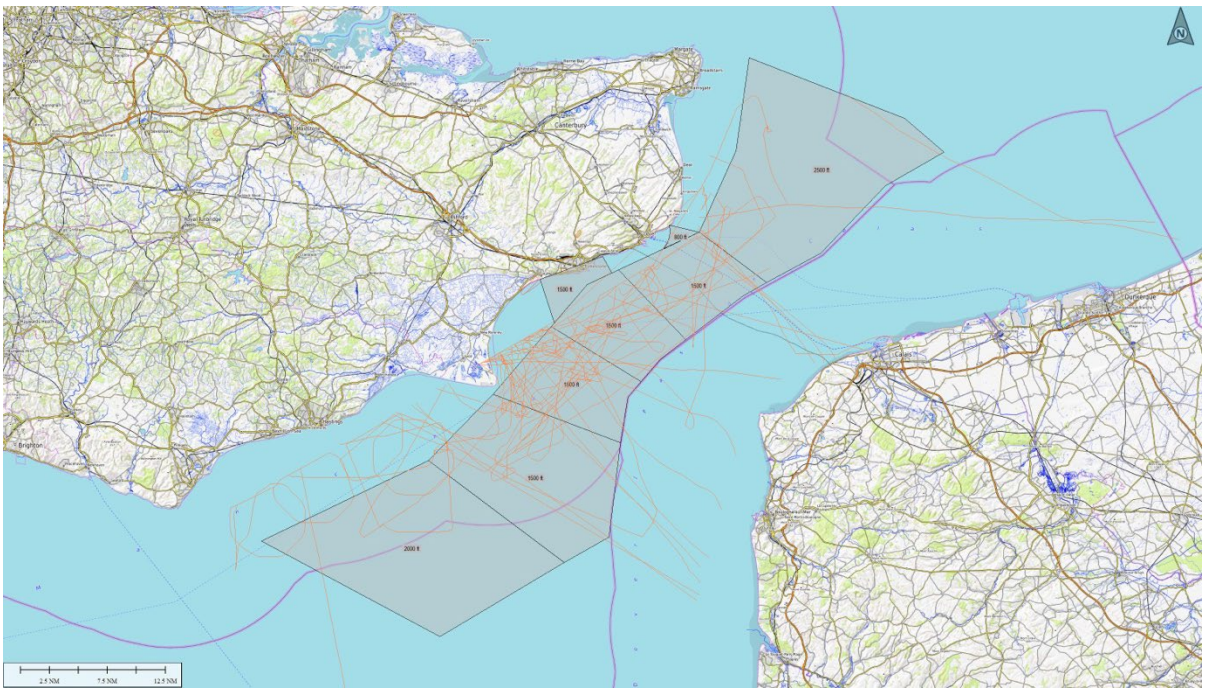


Figure 11: June 2019 – Aircraft traffic.

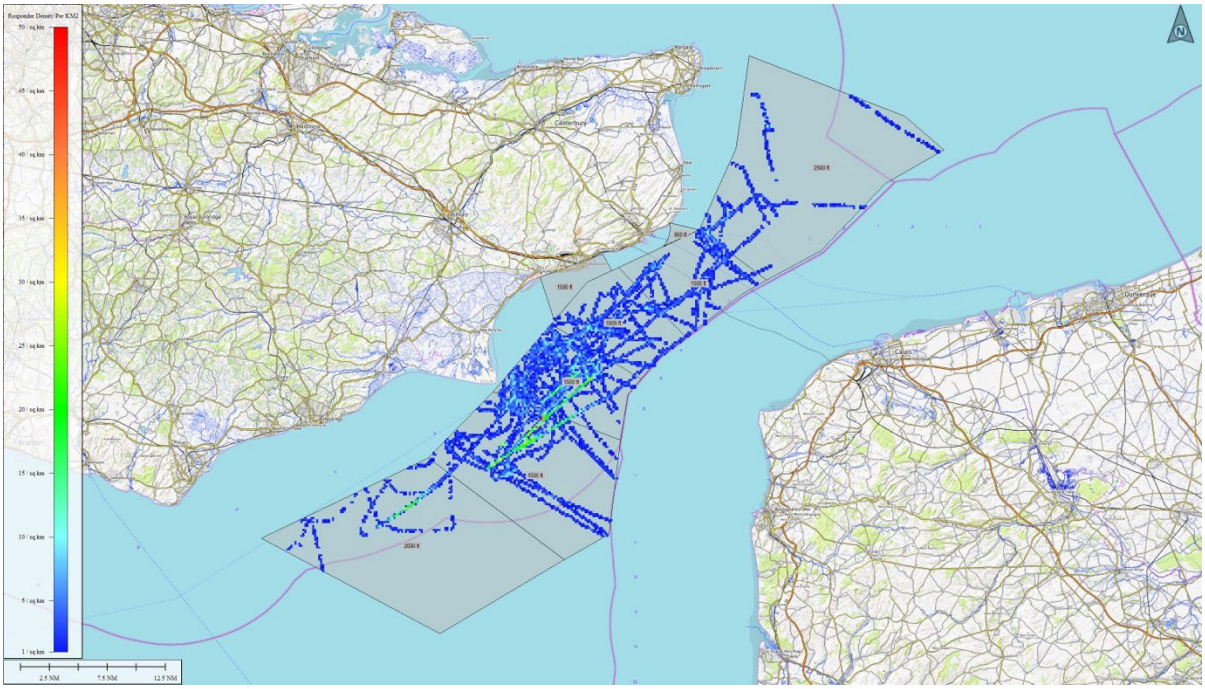


Figure 12: June 2019 – Aircraft density.

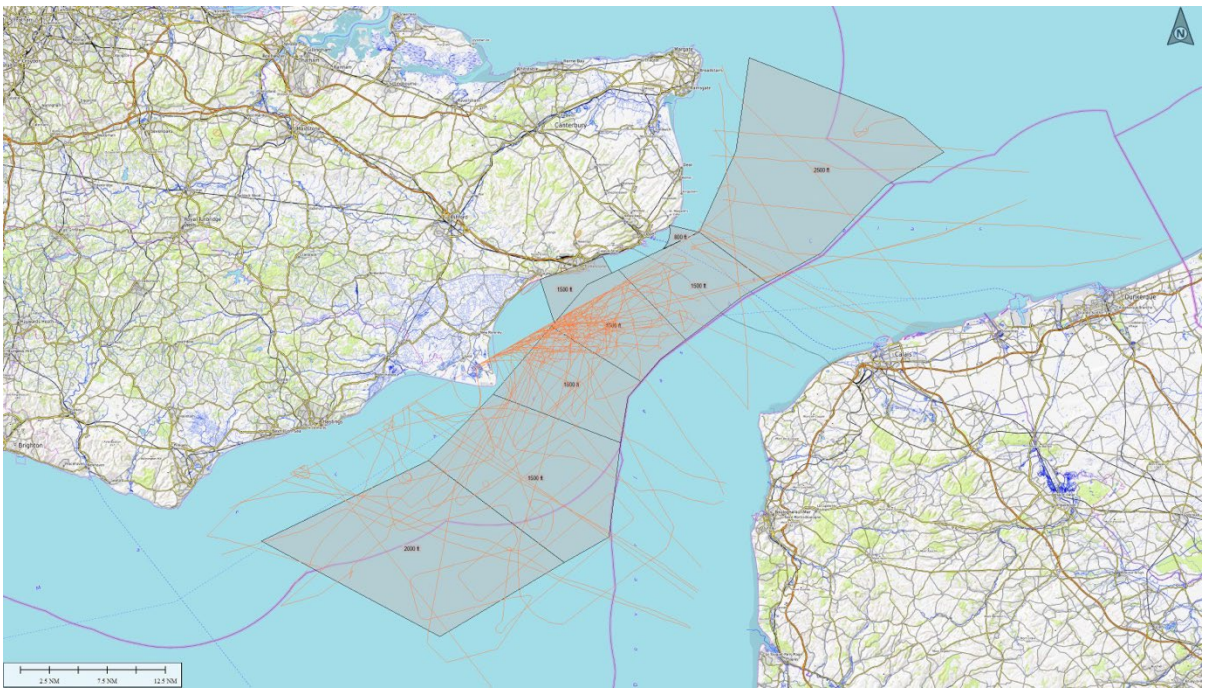


Figure 13: July 2019 – Aircraft traffic.

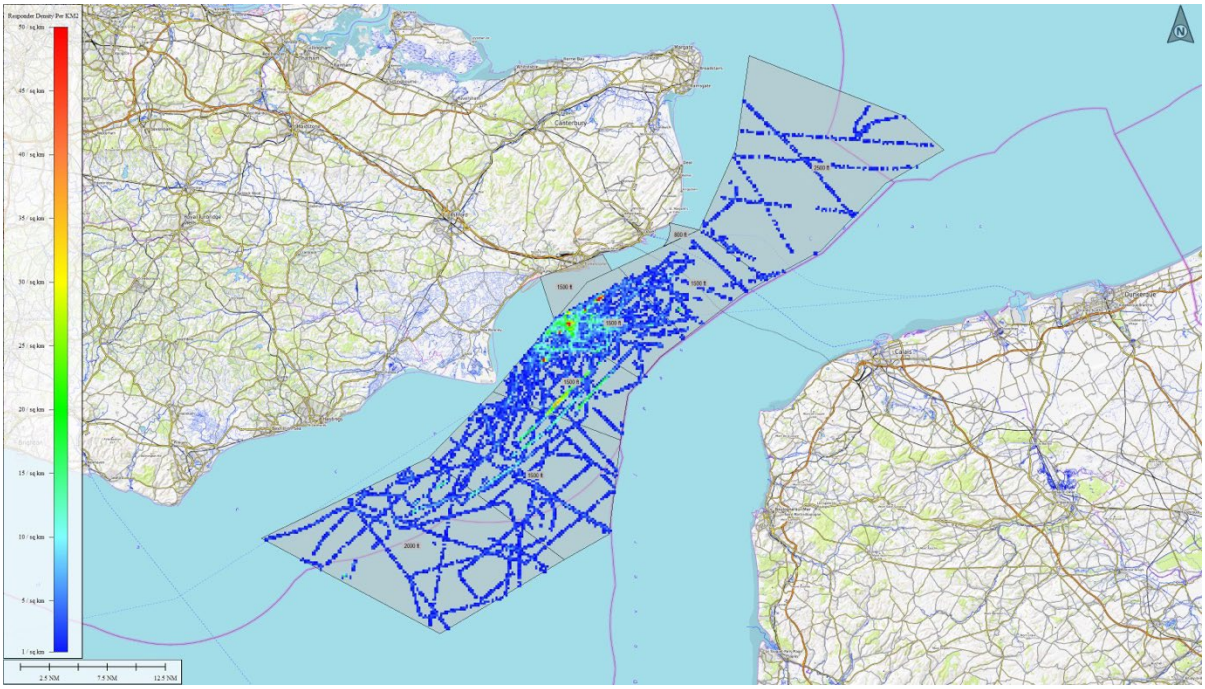


Figure 14: July 2019 – Aircraft density.

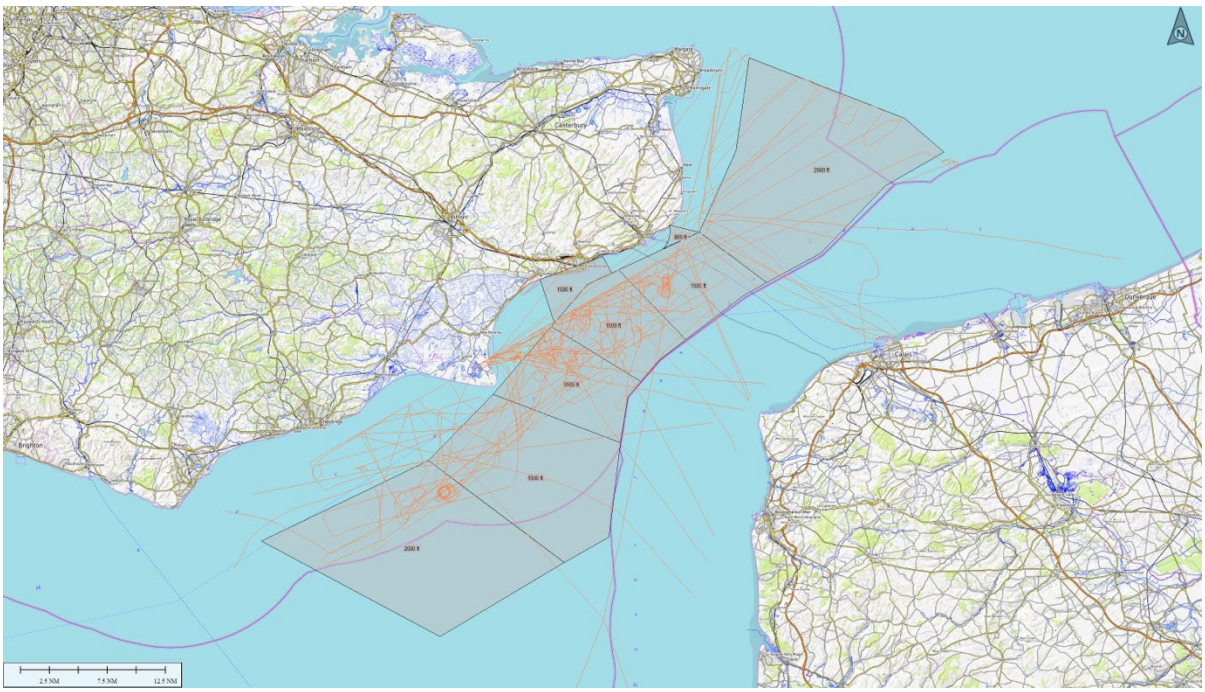


Figure 15: August 2019 – Aircraft traffic.

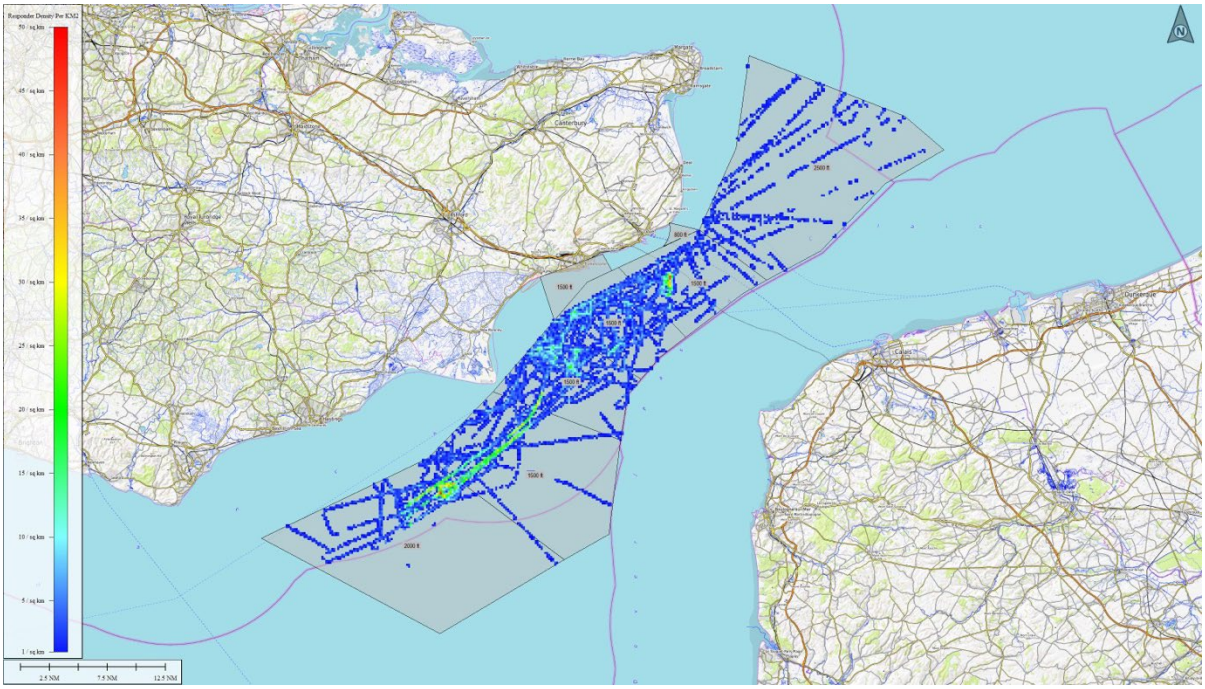


Figure 16: August 2019 – Aircraft density.

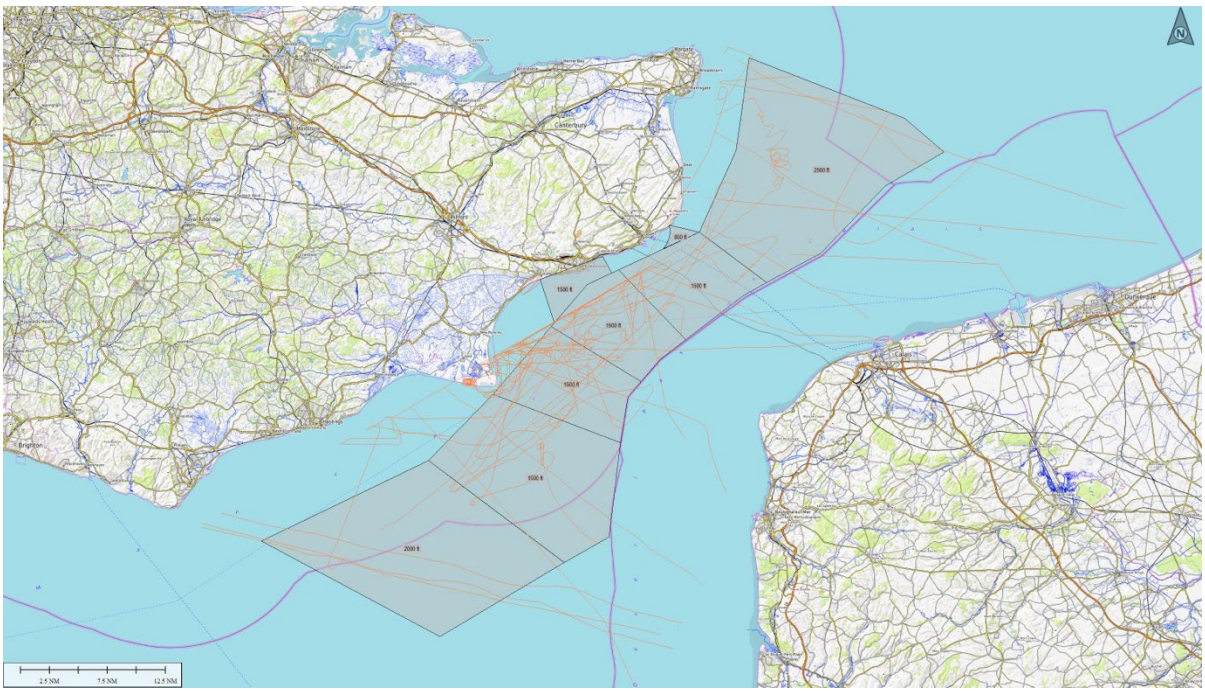


Figure 17: September 2019 – Aircraft traffic.

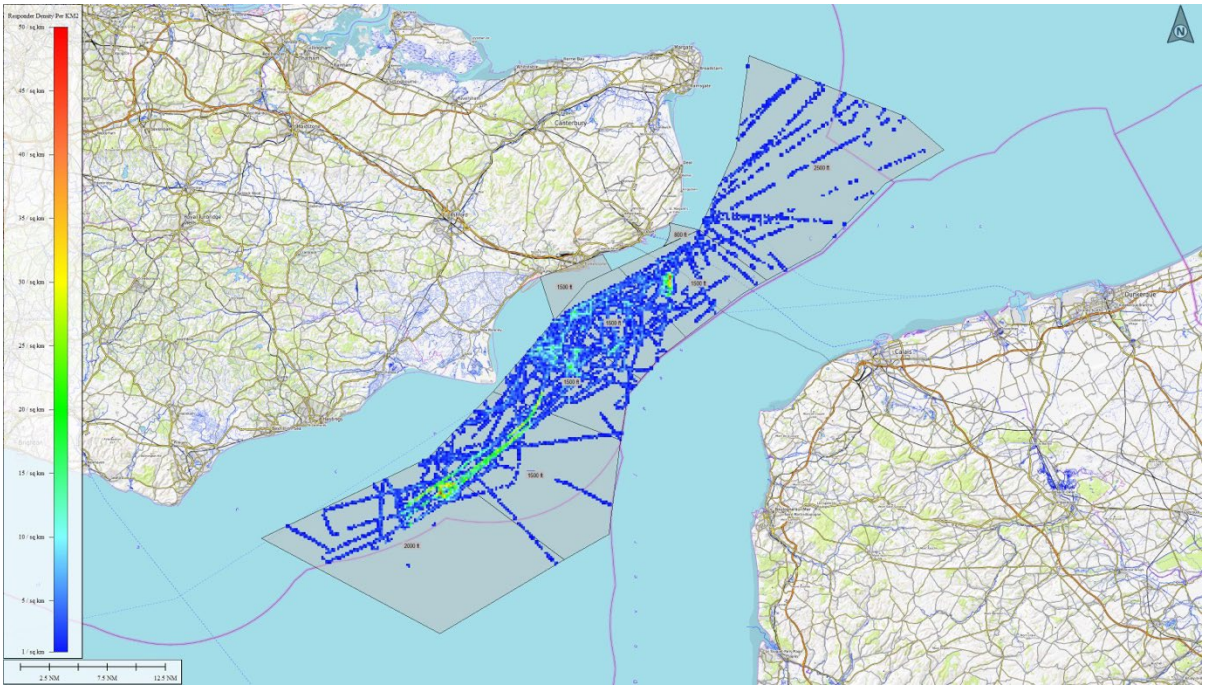


Figure 18: September 2019 – Aircraft density.

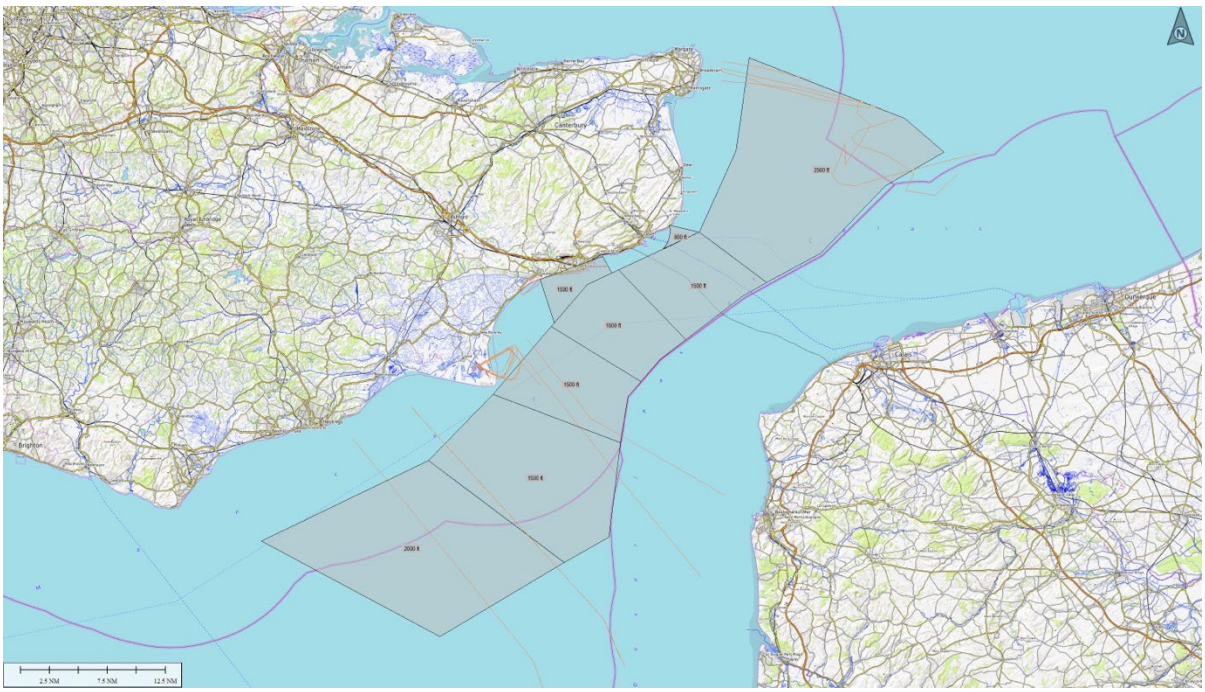


Figure 19: October 2019 – Aircraft traffic.

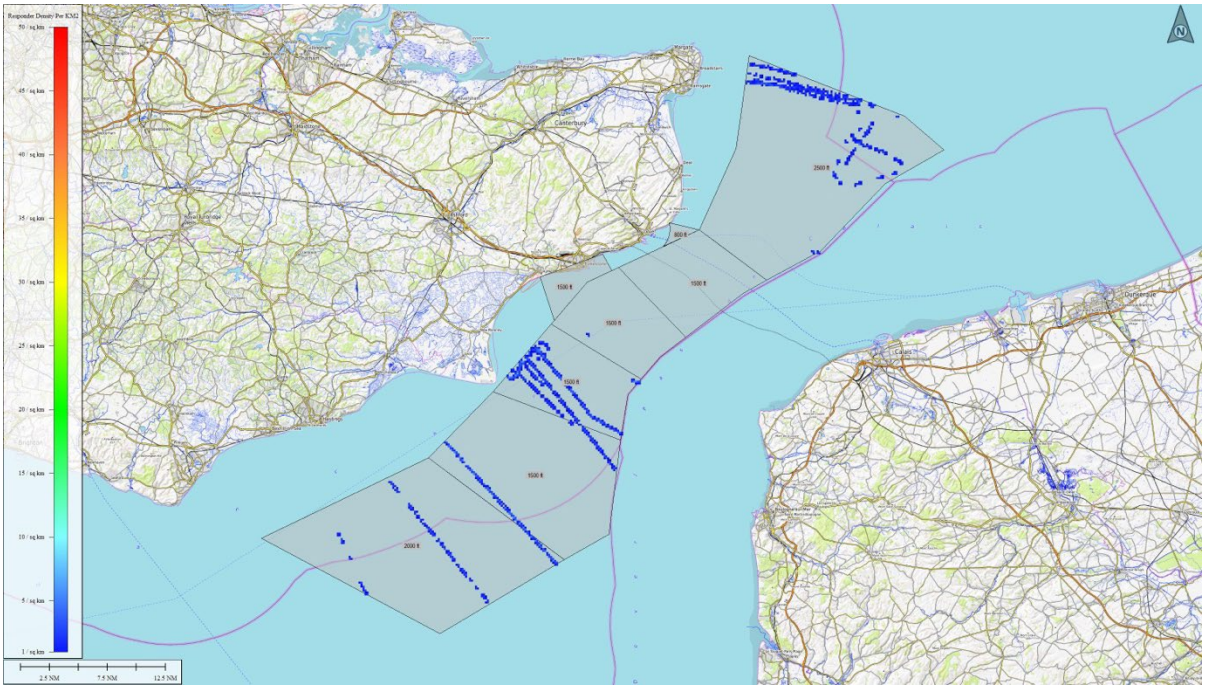


Figure 20: October 2019 – Aircraft density.

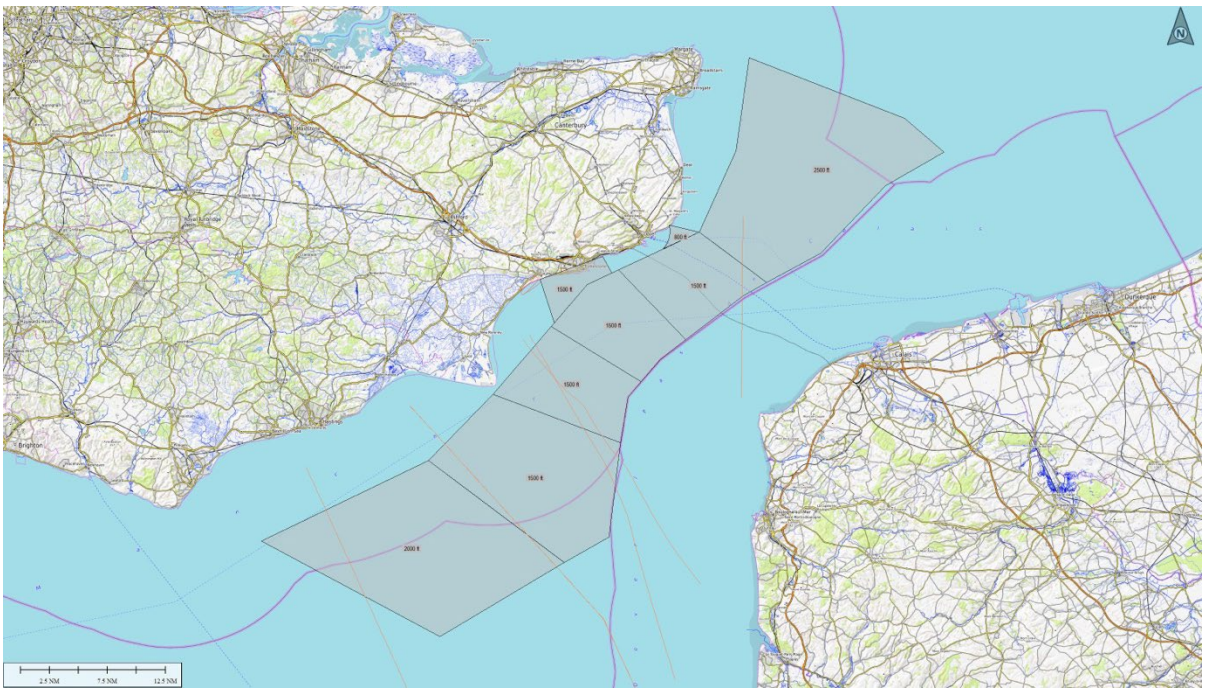


Figure 21: November 2019 – Aircraft traffic.

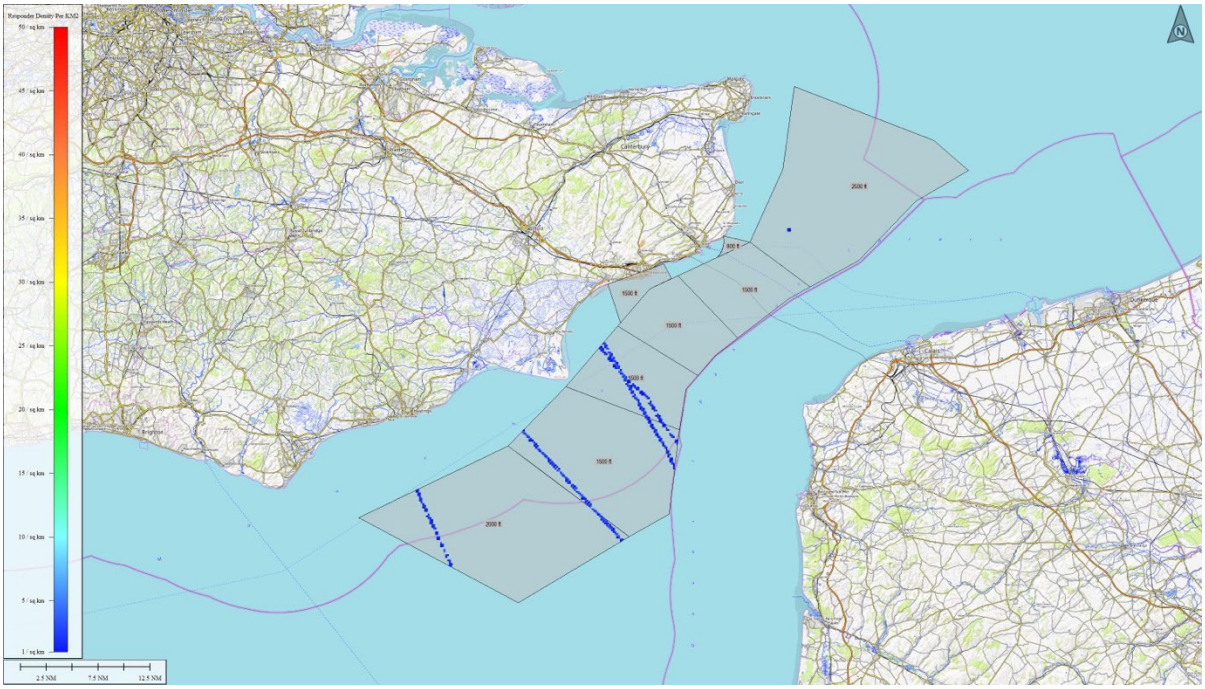


Figure 22: November 2019 – Aircraft density.

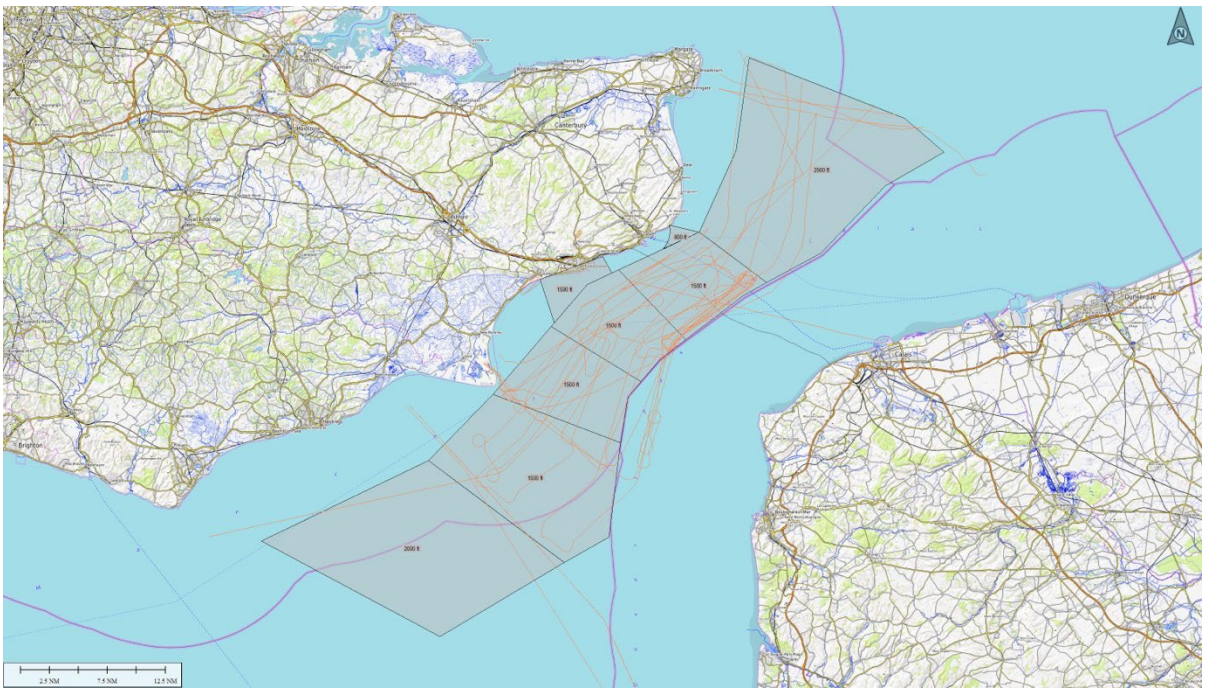


Figure 23: December 2019 – Aircraft traffic.

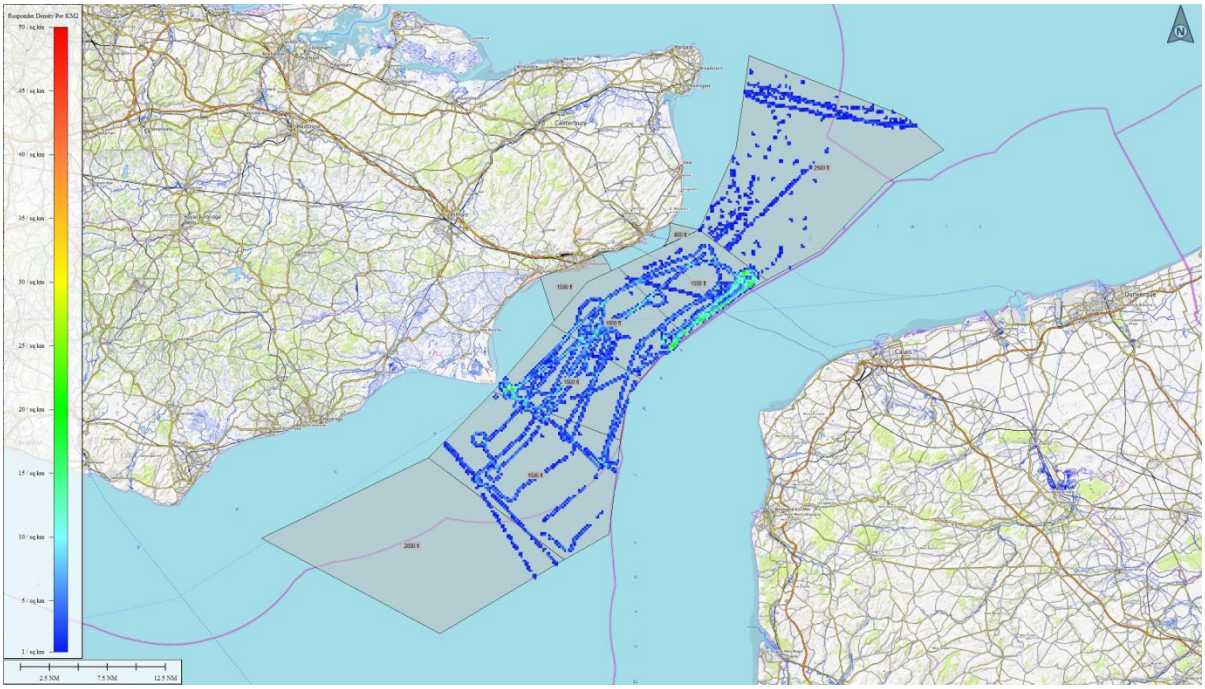


Figure 24: December 2019 – Aircraft density.