CROSSING A LINE
THE USE OF DRONES TO CONTROL BORDERS
Drone Wars UK is a small British NGO established in 2010 to undertake research and advocacy around the use of armed drones. We believe that the growing use of remotely-controlled, armed unmanned systems is encouraging and enabling a lowering of the threshold for the use of lethal force as well as eroding well established human rights norms. While some argue that the technology itself is neutral, we believe that drones are a danger to global peace and security. We have seen over the past decade that once these systems are in the armoury, the temptation to use them becomes great, even beyond the constraints of international law. As more countries develop or acquire this technology, the danger to global peace and security grows.

Drone Wars UK would like to thank Bruno Martins and Chris Jones for their assistance in preparing this report.

Note: The term ‘drone’ is used interchangeably with ‘Unmanned Aerial Vehicle (UAV)’ in this report.

Supported by a funding from the Foundation Open Society Institute in cooperation with the Human Rights Initiative of the Open Society Foundations and the Joseph Rowntree Charitable Trust (JRCT).
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Summary</td>
<td>2</td>
</tr>
<tr>
<td>1 Introduction</td>
<td>4</td>
</tr>
<tr>
<td>2 United States of America</td>
<td>6</td>
</tr>
<tr>
<td>3 European Union</td>
<td>13</td>
</tr>
<tr>
<td>4 United Kingdom</td>
<td>25</td>
</tr>
<tr>
<td>5 China</td>
<td>35</td>
</tr>
<tr>
<td>6 Korea</td>
<td>38</td>
</tr>
<tr>
<td>7 Russia</td>
<td>42</td>
</tr>
<tr>
<td>8 Australia</td>
<td>44</td>
</tr>
<tr>
<td>9 Non-state actors and non-government organisations</td>
<td>47</td>
</tr>
<tr>
<td>10 Conclusions</td>
<td>50</td>
</tr>
<tr>
<td>List of acronyms</td>
<td>53</td>
</tr>
</tbody>
</table>
The use of drones for military purposes over the past twenty years has attracted considerable interest, comment, and scrutiny, but there has been far less focus on the use of military-style drones for security purposes in the civilian world. One of the areas where this is most apparent is in the use of drones for border control.

Drones are now being used to patrol national borders in many different parts of the world but this poses significant challenges to traditionally held views on personal privacy and individual liberties and raises important legal, ethical, and moral questions about how military technology is used in civilian society. In some cases, the use of drones may exacerbate military tension over disputed borders. A drone flown close to the border with a neighbouring state with which relations are poor may be seen as provocative and bring about potentially dangerous consequences.

This report maps out the current state of play on the use of drones for border surveillance and control, explores the practical and political issues associated with the use of drones for this purpose and some of the ethical questions and risks. The report reviews how drones are used in border control by a number of nations, with differing motives:

- The United States, which has pioneered the use of drones to patrol its land borders with Mexico and Canada.
- The European Union, where drones are playing a key role in attempts to ‘push back’ irregular migrants aiming to cross the Mediterranean Sea.
- The United Kingdom, which is beginning a journey which would see drones used regularly to police the skies of the English Channel and elsewhere.
- China, where the use of drones in contested border areas raises risks of provocation and conflict escalation.
- Korea, where the two rival states on the Korean Peninsula regularly use drones to spy on each other’s military activities.
- Russia, and its sensitivity over the use of drones for intelligence-gathering operations along its borders with NATO members.
- Australia, where a nationalist government sees drones as the solution for monitoring vast areas of ocean to prevent irregular migrants from entering the country.
Finally, we look at the use of drones by a variety of non-state actors and non-government organisations for both lawful and unlawful purposes to exploit or highlight inadequacies in the way borders are managed by sovereign states.

The study concludes that the use of drones for border control is a symptom of viewing borders predominantly in terms of ‘security’ and perceiving people crossing borders as a security threat, with negative implications for the rights of individuals. Drones are often used as part of an integrated set of technologies – satellites, sensors, smart walls – in border policing. The use of drones and advanced combat-derived technology for border control operations is part of a security paradigm where border control operations are heavily influenced by the military and driven by ‘national security’ considerations rather than human needs.

On the basis of our findings, we highlight the following as particular risks resulting from the use of drones in border areas:

- The risk that drones will increasingly be used for surveillance of the wider population - not just those involved in criminal activities at borders - at ‘upstream’ internal border locations, and not just the geographically-defined border itself.
- The risk that the use of drones, as a primarily military technology, in border control will contribute to the dehumanisation of those attempting to cross borders and increase the potential for human rights abuses.
- The risk that states will use drones, as opposed to crewed aircraft and assets, to evade their humanitarian responsibilities to those in distress.
- The risk that information from unrelated surveillance activities (for example shipping control or traffic monitoring) is passed on to border control and other law enforcement agencies for inclusion into a broader ‘intelligence picture’.
- The risk that, if drones are deployed in a zone where there are border tensions between two nations, there will be a blurring between military and policing roles and a temptation to use drones in spying or intrusion missions which may escalate tensions.
The use of unmanned aerial vehicles (UAVs), commonly known as drones, for military purposes over the past twenty years has rightly attracted considerable interest, comment, and scrutiny. There has been far less focus, however, on the use of military-style drones for security purposes in the civilian world. One of the areas where this is most apparent is in the use of drones for border control.

Today, military technologies developed as part of the endless ‘war on terror’ are coming home in troubling ways, posing significant challenges to traditionally held views on personal privacy and individual liberties. Unarmed drones operated by state agencies have begun to appear in the skies above many industrialised countries, and drones have also proliferated into the hands of non-state groups with harmful intentions. The military use of drones has normalised their adoption for a wide range of purposes on the battlefield and, increasingly in the civil sector, but there has been little debate over this even though it raises important legal, ethical, and moral questions about how military technology is used in civilian society.¹

The increasing use of drones for border control has a direct bearing on these questions. As this report demonstrates, drones are now being used to patrol national borders in many different parts of the world. Their ability to provide surveillance for extended periods, monitor remote and inaccessible areas, and relative ease of deployment makes them attractive tools for agencies responsible for border control. At the same time, surveillance drones and their sensors are based on sophisticated military technology which is often seen by governments as providing an easy answer to complex social and political crises. The use of drones for border control is a symptom of viewing borders predominantly in terms of ‘security’ and perceiving people crossing borders as a security threat.

The use of drones for border control also raises the question of where, exactly, does a border end? Although a border may be a thin line on a map which precisely defines the territory of a state, for security purposes its definition is much more complex. Government agencies have sweeping powers to enforce border security across the whole nation in terms of tackling border crime, identifying irregular migrants, and imposing security requirements upon travellers and goods crossing borders. Drones enable ‘upstream’ surveillance which allows a state to monitor and intervene in developments both inside and outside the country, far from its immediate border, for example by assessing

migration patterns, observing events in neighbouring nations, or asserting control over remote seas. The result is an invisible, quietly-growing dragnet within which the state is increasingly able to observe and intrude in the lives of citizens. A drone flown close to the border with a neighbouring state with which relations are poor may be seen as provocative and bring about potentially dangerous consequences.

This report aims to map out the current state of play on the use of drones for border surveillance and control, exploring the practical and political issues associated with the use of drones for this purpose and some of the ethical questions and risks. We review how drones are used in border control by a number of nations with differing motives - the United States, the European Union and its member states, the United Kingdom, China, Korea, Russia, and Australia - as well as by non-state actors and non-government organisations, and attempt to draw lessons and conclusions about the resulting impacts on society.
The United States of America has long used drones to patrol its borders, particularly its southern border with Mexico. Drones first started patrolling America’s borders in the early 1970s when the Nixon government began work to develop a sophisticated network of sensors and surveillance devices along the US–Mexico border. The network was based on plans for a similar system, known as ‘Igloo White’, which was intended to act as a surveillance network in the jungles of South East Asia for detecting Viet Cong supply routes during the Vietnam war. The initiative was the beginning of a programme of electronic surveillance around the US–Mexico border which continues to expand today. Under the programme remotely controlled pilotless QU-22B aircraft operated by the US Air Force were flown over the border to relay data from sensors planted at distant border locations back to controllers.

More recently, the US Marine Corps deployed RQ-2 Pioneer drones to the southern border in support of civilian agencies in 1990, 1998, 1999, 2001, and 2002 as part of Joint Task Force Six, an inter-agency drug interdiction campaign which was also credited for apprehending many individuals involved in unauthorised border crossings. In 2017 and 2018 the Army deployed the MQ-1C Gray Eagle drone (a version of the Predator developed for Army use) and the Marines deployed the smaller RQ-21 Blackjack for further security operations on the US–Mexico border. These operations were typically discrete actions lasting for several months.

The US military continues to play a role in border policing operations along the US–Mexico border. In 2018 President Trump deployed the US National Guard (a military reserve force) along the US border with Mexico, and there has been speculation that military Reaper drones may in future be used in border surveillance and intelligence gathering operations as part of this initiative. A Department of Defense MQ-1C Gray Eagle drone was on call throughout 2018 in support of southern border security missions.

---

However, day-to-day control of the US’ borders is the responsibility of the Department of Homeland Security’s Bureau of Customs and Border Protection (CBP). CBP first tested a drone over the southern border in 2004, using an Elbit Hermes 450 medium altitude long endurance (MALE) drone for surveillance. In October 2005 CBP flew its first General Atomics Predator drone – an unarmed version of the aircraft infamously used by the US military – along the border with Mexico. The aircraft crashed into a hillside near Nogales, Arizona in April 2006 after the contractor flying it shut down the engine in mid-flight.

CBP now has a fleet of ten General Atomics Predator B and Guardian (another member of the Predator family) drones which fly from Sierra Vista in Arizona and Corpus Christi in Texas to watch the southern border and from Grand Forks, North Dakota, to patrol the northern border with Canada. The programme is operated by CBP’s Air and Marine Operations (AMO) and, according to drone analyst Arthur Holland Michel, “represents the federal government’s most sustained and substantial domestic drone programme.”

CBP’s Predator drones are used in three roles. They fly on routine patrols to search for the illegal transit of goods or people across the border; they provide aerial support for law enforcement activities and investigations; and they can support the emergency response to disasters such as forest fires and flooding.
For border patrol operations CBP’s Predators are used “to conduct missions in areas that are remote, too rugged for ground access, or otherwise considered too high-risk for manned aircraft or personnel on the ground.” They are equipped with electro-optical and infrared cameras which can record in day or night and track the movement of vehicles and boats and gather terrain information. One of the aircraft is equipped with a Wide Area Surveillance System, which allows the crew to monitor an area approximately 3.7 miles wide (see Box 1). The drones can stay in the air for up to 30 hours and can conduct persistent surveillance over a selected area.

Box 1
Wide Area Persistent Surveillance: A permanent eye in the sky

The development of wide area persistent surveillance (WAPS), also known as wide-area motion imagery (WAMI) or wide-area airborne surveillance (WAAS), is closely linked to the evolution of the US Reaper drone programme. First developed as part of an initiative to tackle the use of deadly roadside bombs by insurgents in Iraq against the US occupying forces, WAPS systems are able to provide continuous views of large areas and monitor and track activity within these areas.

Mounted on a drone or small aircraft, WAPS systems combine high-resolution imaging technology and artificial intelligence computer processing to capture and archive video footage over an area several thousand times larger than a traditional camera is able to do – typically a city-sized area, kilometres in diameter. Operating over an extended period of time, they are able to maintain a continuous record of events within a given area of coverage, allowing people, vehicles, and objects to be identified. The movements of these ‘targets’ can be monitored in real time or tracked backwards to establish where they have come from, where they are going, who they have contacted, and patterns of life. Air-based WAPS systems such as Gorgon Stare, Constant Hawk, Angel Fire, and Blue Devil are credited with having ‘eliminated’ thousands of suspected insurgents in the Middle East.

Having witnessed the capability of such systems in the war zone, electronics companies and ex-military entrepreneurs are now keen to apply them to domestic policing by ‘filming everything all the time’ to identify criminals and criminal networks. WAPS systems have been trialled by law enforcement agencies over a number of cities in the US and apparently also in the UK, where the Ministry of Defence has sponsored a number of unpublicised test flights tracking cars along major roadways.

Difficulties and questions

After high initial expectations, the Predator border surveillance programme appears to have been somewhat of a let-down for the US government authorities. This became apparent after an audit conducted by the Department of Homeland Security’s inspector general in 2014 which concluded that the programme had cost five times as much as expected; aircraft were frequently grounded; operations were restricted by weather and airspace restrictions, and that the drones had only helped identify a small number of illegal border crossings. The inspector general found “little or no evidence” that the fleet

had met its programme expectations and concluded that money allocated to expand the programme could be put to better use by investing in alternatives such as manned aircraft and ground surveillance assets.\textsuperscript{10} A subsequent audit by the inspector general highlighted concerns that CBP did not have adequate security precautions in place to safeguard data collected using the drones. Failures included a lack of monitoring to ensure effective handling of security incidents; inconsistent oversight of contract personnel; and inadequate control of access to ground control stations housing surveillance data.\textsuperscript{11}

The Cato Institute, a US think-tank, has also critiqued the use of drones for border surveillance and raised concerns about the privacy implications of drone surveillance, warning that they allow CBP to “freely use its surveillance authority to collect information on the lives of law-abiding US residents inside the United States”.\textsuperscript{12} The Institute recommends that CBP should wind down its drone programme and in the meantime establish more robust privacy protections (see Box 2).

One of the Cato Institute’s greatest concerns about the programme is that CBP Predator drones are not used exclusively for border patrol purposes. According to a CBP fact sheet “the MQ-9’s unique capability for enduring, covert surveillance of illicit activities along US borders and approaches is in high demand by CBP and its partners”, and the drone has a “large interagency customer base.” This includes other agencies within the Department of Homeland Security, such as the Drug Enforcement Agency; other law enforcement agencies such as the FBI and local police and sheriff departments; and civilian agencies such as the Coast Guard, Federal Emergency Management Agency, and National Weather Service.\textsuperscript{13}

### Straying from the border

In an effort to understand how the drones are used by CBP and other agencies, an investigation by science and technology website Gizmodo in June 2020 used flight tracker data to trace flight paths of seven of CBP’s Predator drones over the previous year. Although the majority of the drones’ flight paths were, as would be expected, close to or along the border, the data reveal that the aircraft have also been operated in locations far from the US’s borders.\textsuperscript{14} CBP asserts the authority to undertake operations within 185 km of the border itself, and within 161 km of any port of entry to the US, and the drones were occasionally used to intensively...


watch border cities within these zones, such as Laredo, Texas, and also cities outside the zone, such as San Antonio, Texas. They also occasionally flew outside the US’s borders into Mexico.

CBP’s Predator drones were also used to observe political protests, such as protests at Standing Rock Sioux tribal lands against the Dakota Access Pipeline in 2016 and protests in Minneapolis in May 2020 against racism and police brutality following the killing of George Floyd by officers from Minneapolis Police Department. In February 2020 one of the drones spent hours loitering above indigenous land in Minnesota that had been the site of protest against tar sands pipelines. Perhaps most surprisingly of all, in February / March 2020 one aircraft conducted 20 operations in Panama’s airspace, focusing on islands and small towns in the Gulf of Panama. Panama City “sits between the two cocaine smuggling routes that move approximately 84 per cent of all cocaine destined for the United States,” according to CBP.

The politics of the US–Mexico border have assumed a high profile in American politics over recent years, largely as a result of inflammatory rhetoric by President Trump, his proposals for a border wall, and his 2019 declaration of a national emergency concerning the southern border. Although many of Trump’s immigration policies have faced fierce opposition in the House of Representatives, there is nevertheless a measure of bipartisan political support for continued development of a ‘smart wall’ based on surveillance technology along the border, which is seen as being cheaper, less disruptive, and less politically controversial than Trump’s physical wall. Proponents of a ‘smart wall’ are willing to fund further expansion of the long-standing programme of electronic surveillance around the US–Mexico border, with the vision of building a coast-to-coast technological barrier made up of a variety of sensors to watch those who attempt to cross the border in remote areas without authorisation.15

Previous efforts to create a surveillance network on the US borders have had mixed results. The Secure Border Initiative Network (SBINet) initiative,

---

intended to create a web of surveillance towers, sensors, and command centres along the borders, was commenced by the Bush Junior administration in 2006. The project was cancelled in 2011 with just 53 miles of the virtual fence built after a General Accounting Office report severely criticised the project and $1 billion had already been spent. However, since then surveillance technology has improved, and the advent of artificial intelligence-based image analysis, with the potential to automatically detect intruders and alert controllers, has rekindled interest in such a scheme.

According to Todd Miller, author of the book ‘Border Patrol Nation’, in 2012 the US–Mexico border was watched by “377 remote video surveillance systems, 195 local video surveillance systems, 305 large-scale nonintrusive inspections systems, 75 Z Backscatter vans, 261 Recon FLIRs, more than 12,000 sensors, and 41 mobile surveillance system trucks.” Since then further and more sophisticated equipment has been installed. This includes artificial intelligence-powered cameras; radar, lidar, seismic, acoustic, and magnetic sensors; fibre optic sensing able to detect tunnelling; and mobile phone location and tracking systems.

Drones have an integral role in this border smart wall. As well as operating a Predator drone fleet, CBP is also exploring the role of smaller drones in watching the border and in September 2017 began testing hand-launched drones. CBP claims “great success” with the pilot schemes undertaken to date. Between October 2018 and April 2019, the US Border Patrol flew small drones for a total of around 176 flight hours, resulting in 474 apprehensions of individuals at the border. The agency has now placed an order for around 100 more small drone systems, including about 40 Aeryon SkyRaiders and 60 Lockheed Martin Indago 3 systems, which will join AeroVironment Ravens and InstantEyes on loan from the Department of Homeland Security. Pilot programmes will continue along both the US southwest and northern borders to assess their value.

### Box 2

**Drones on the border: undermining the spirit of the American Revolution?**

The Cato Institute is an influential US think tank which claims to further the principles of the American Revolution by advocating a limited role for government in domestic and foreign affairs and support for free markets and individual liberty. In 2018 the Institute published ‘Drones on the Border’, a briefing which examined the effectiveness and privacy implications of the CBP drone programme.

The briefing took a sceptical view of the use of drones for border protection and argued that drones “have failed to help CBP apprehend illegal border crossers and seize drugs,” calculating that their use had only led to 0.5 per cent of apprehensions of those crossing the border at a cost of $32,000 per arrest compared with an average cost of apprehension of less than $9,000. It concluded that CBP’s Predator drones were airborne only 6.4 per cent of available hours per year from 2013 to 2016, whereas CBP’s other aerial assets, such as unmanned aerostats (balloons) fitted with the Tethered Aerostat Radar System, which are relocatable at various points around the border, are able to operate around 60 per cent of the time.

---


17 Shirin Ghaffary: ‘The “smarter” wall: How drones, sensors, and AI are patrolling the border’, op cit.

The briefing pointed out that CBP’s drones also lack the authority to fly in certain areas. They require advanced permission from the US Department of Defense to fly in restricted airspace and they cannot fly in areas with a high volume of commercial flights, which excludes large areas of the border in California and Arizona from drone coverage. Two CBP drones have crashed within ten years of purchase – one because of human error in 2006 and another owing to a generator failure in 2014 – further reducing coverage.

The Cato Institute challenges CBP’s assertion that drones detect patterns of illegal entries, allowing the agency to reposition its assets accordingly. It argues that only 2 per cent of drone missions resulted in any evidence of a previously undetected illegal crossing in 2014, and that the drones may have detected at most 1.2 per cent of total illegal border crossings.

The Cato Institute also argued that drones undermine privacy as their surveillance records the daily lives of people living along the border, and because CBP regularly uses its drones to support the operations of other federal agencies for surveillance nationwide with minimal oversight. The agency has no obligation to obtain a warrant before using drones for surveillance, and can therefore “freely use its surveillance authority to collect information on the lives of law-abiding US residents inside the United States”. The briefing concludes that CBP’s drone program has “failed to live up to its expectations” and that “its expense, disproportionately small contribution to border security, and infringement on Americans’ privacy” are good reasons for CBP to wind down its drone programme. In the meantime, it recommends the following measures to safeguard individual privacy:

- CBP should use its drones solely for border security operations except in the case of states of emergency.
- CBP should not conduct drone surveillance more than five miles from the border.
- If CBP does use its drones to support state and local operations, it should ensure that its drone pilots comply with state and local drone legislation, including warrant requirements.
- CBP should not seek drones with facial recognition capability, which puts law-abiding Americans’ privacy at increased risk.
- At least six months before deploying new surveillance technology, CBP should disclose details about the technology’s capabilities, including information about the type of data to be collected, how long CBP plans to keep the data, when CBP will share the data, and with whom it will share the data.
- CBP should study replacing drones with surveillance technology that limits unnecessary data collection on US residents.
Over the last decade irregular migration into Europe has increased, with people from Africa and the Middle East — notably conflict zones in Syria, Iraq, and Afghanistan — moving into southern and eastern European countries. Approximately one in five of the 120,000 people who arrived clandestinely in Europe in 2019 entered across land borders into Greece, Bulgaria, and Balkan countries. The vast majority arrived by sea, making the dangerous crossing of the Mediterranean Sea from Turkey or North Africa. Since October 2013 approximately 19,000 people have been reported as dead or missing having attempted to cross the Mediterranean.

Following a shipwreck off the coast of the island of Lampedusa in 2013 which reportedly resulted in more than 360 deaths, the Italian government commenced Operation ‘Mare Nostrum’, a large-scale humanitarian operation that involved search and rescue missions led by the Italian Navy and Air Force which has been credited with saving over 100,000 lives. The operation ended a year later with Italy unable to sustain its funding following the refusal of other EU member states to contribute to costs.

Operation ‘Triton’ was set up by the European Union (EU) to replace Mare Nostrum from November 2014 under the auspices of Frontex, the European Border and Coast Guard Agency, with less funding, fewer ships, and a revised mandate. Frontex’s Deputy Director Gil Arias Fernandez stated: “I would like to underline that operation Triton focuses on border control and surveillance. Having said that saving lives will remain an absolute priority for Frontex.”

Despite this, deaths in the Mediterranean Sea rose during Operation Triton and in 2016 fatalities and disappearances had reached over 5,100 according to the International Organization for Migration.

In May 2015, the European Union launched a new operation, EU NavFor Med which aimed to combat smuggling gangs. The first phase involved naval surveillance and monitoring of smuggling patterns from Libya towards Italy and Malta, and the second phase, Operation ‘Sophia’, commenced in October
and was aimed at disrupting people trafficking by boarding, searching, seizing, and diverting smugglers' vessels in international waters. Operation Sophia has been credited with saving more than 45,000 lives at sea since it began in 2015. However, from April 2019 the operation focused solely on-air operations and training for Libya's coastguard and has subsequently no longer provided aid directly to distressed seafarers. Operation 'Hera', also coordinated by Frontex, takes a similar approach and aims to stop migration along maritime routes from West Africa to the Spanish Canary Islands.

The tightening of arrangements for entry into the European Union is a consequence of the Schengen Agreement, which has removed controls at internal borders between the majority of EU states to enable the free movement of people. This policy of open borders internally has resulted in the strengthening of controls at the EU's external borders. The Schengen requirements determine the immigration policies of EU member states, which are based on mutual trust in effective control at the external borders. The EU's approach to prevent migration into the Schengen area has therefore been to try to prevent informal border crossing altogether, by strengthening border controls and taking measures to prevent irregular migration 'upstream' through initiatives in source countries for migration.

Increasingly, the EU's borders are controlled by the use of advanced technology, including the use of 'smart border' data processing systems at points of entry and sophisticated aerial and maritime surveillance of external borders. This approach has been criticised for creating a 'Fortress Europe' or 'Technological Fortress'. The use of drones should be seen as part of a broader effort to collect more data and pro-actively control every movement at the border, or even before it is reached, to pre-empt efforts to cross the border informally.  

**Europe’s guardians**

EU member states have principal responsibility to implement border controls, but the EU has also set up its own institutions to control migration into Europe. The most important of these are the European Border and Coastguard Agency, also known as Frontex, and the European Border Surveillance System (Eurosur).

Frontex was established by the EU in 2004, and reformed by further legislation in 2007 and 2016. Over this period, it has grown in budget, resources, and powers. The agency is tasked, among other duties, with the coordination of member states' actions in border management, the organisation of operations to return migrants who are not entitled to remain in the EU, and the analysis of risks relating to the EU's borders. Its powers and role are evolving from an emergency-driven approach in its early years, when it responded largely to support requests from member states, to a militarised and intelligence-based approach to border security.  

Frontex provides support to member states with its own European Border Guard teams and equipment from its Technical Equipment Pool, which includes everything from coastal patrol boats and aircraft to dogs.  

---


Frontex manages the intelligence element of its work through Eurosur, an information-exchange framework for the management of Europe’s external borders. Eurosur supports member states by increasing their situational awareness and reaction capability in combating cross-border crime, tackling irregular migration, and preventing the loss of lives at sea.

Eurosur is based around a network of National Coordination Centres (NCCs), one in each member state, which coordinate border surveillance activities on national level and act as a hub for the exchange of information. Each NCC collects local and national information about what is happening at the border, including irregular border crossings and criminal activity. Eurosur uses intelligence fusion methods to analyse information from a variety of sources, allowing Frontex to prepare national situational pictures, a European situational picture and, looking beyond the EU’s borders, a common pre-frontier situational picture to allow member states to target the deployment of their border control forces. Eurosur collates and shares information provided by member states and other EU agencies such as the European Maritime Safety Agency (EMSA) and the European Fisheries Control Agency (EFCA), allowing Frontex to draw on information from a range of sources and surveillance platforms.

As well as sharing common information services, Frontex, EMSA, and EFCA also have inter-agency agreements to share reconnaissance capabilities, including the use of drones. Surveillance programmes conducted by the three EU agencies are usually undertaken on behalf of coastguard agencies of EU member states as joint operations with a number of purposes including controlling irregular immigration, smuggling, illegal fishing and marine pollution. Among the three agencies EMSA has taken the lead in trialling the use of drones.

EMSA commenced using drones to support coast guard functions for member states and European Free Trade Area (EFTA) countries in 2017 when, as part of a project to investigate the creation of a European coast guard function, EMSA conducted trials of drones for a variety of marine surveillance tasks on behalf of the three agencies. The demonstrations “proved that RPAS data (video and still images) greatly increase the maritime picture for a wide variety of maritime surveillance operations.” Coastguard agencies of the host states involved (Greece, Italy and Spain) appreciated the services delivered and the study concluded that interagency cooperation through intelligence sharing and surveillance services was the most effective way forward for monitoring Europe’s Mediterranean border.27 Pilot projects had been run in Malta, Portugal and the Netherlands prior to this, which the executive director of EMSA, Markku Mylly, called “very encouraging”, describing the monitoring of small boats used to carry refugees as the most “acute area” of need for drone surveillance.28

EMSA now retains a fleet of various types of drones that can be leased by EU member states to support coastguard monitoring and the surveillance of maritime activities. Although their capabilities vary, EMSA’s large drones are typically fitted with electro-optical and infra-red cameras, maritime radar, satellite communications, and Automatic Identification Systems (AIS) for identifying shipping. The agency offers its drone services free of charge to EU member states, candidate countries and EFTA member states. The areas of operation can be any sea area surrounding the European Union with an EU or EFTA country as a starting point for flights. The drones are provided under commercial contracts to EMSA, and as well as providing the aircraft and associated equipment contractors are also responsible for flying and maintaining the drones. Video and drone sensor data is streamed live to control centres operated by EU member states and can also be shared with EU agencies such as Frontex and Eurosur. A list of contractors operating on behalf of EMSA and the drones they fly is shown in Table 1 and a list of drone deployments as of October 2019 is shown in Table 2. Notable among these are operations in support of Frontex along the Portuguese coast and in Greece (see below), and in Iceland, which is not a member of the EU but is a signatory to the Schengen Agreement and is part of the European single market.

### Table 1

**European Maritime Safety Agency (EMSA) contracts for drone operations**

<table>
<thead>
<tr>
<th>Operator</th>
<th>Drone manufacturer and type</th>
<th>Contract status*</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>REACT consortium (Tekever and CLS)</td>
<td>Tekever AR5 Evolution</td>
<td>Ended</td>
<td>General Maritime surveillance</td>
</tr>
<tr>
<td>ALTUS</td>
<td>ALTUS Ouranos</td>
<td>Ended</td>
<td>Emission monitoring</td>
</tr>
<tr>
<td>Martek Marine</td>
<td>Skeldar V-200</td>
<td>Ended</td>
<td>Emission monitoring</td>
</tr>
<tr>
<td>RPASMAR consortium (Portuguese Air Force, UAVision, and Deimos)</td>
<td>UAVision Wingo Ogassa</td>
<td>Ended</td>
<td>Emission monitoring</td>
</tr>
<tr>
<td>REACT consortium (Tekever and CLS)</td>
<td>Tekever AR5 Evolution</td>
<td>Active</td>
<td>General Maritime Surveillance</td>
</tr>
<tr>
<td>RPASGUARD consortium (Portuguese Air Force, UAVision, and Deimos)</td>
<td>UAVision Wingo Ogassa</td>
<td>Ended</td>
<td>General Maritime Surveillance</td>
</tr>
<tr>
<td>CeiiA</td>
<td>Elbit Hermes 900</td>
<td>Active</td>
<td>Maritime Surveillance</td>
</tr>
<tr>
<td>Nordic Unmanned</td>
<td>Skeldar V-200</td>
<td>Active</td>
<td>Emission monitoring</td>
</tr>
<tr>
<td></td>
<td>Schiebel S100</td>
<td>Active</td>
<td>Pollution monitoring</td>
</tr>
<tr>
<td>Schiebel</td>
<td>Schiebel S100</td>
<td>Active</td>
<td>General Maritime Surveillance</td>
</tr>
<tr>
<td>Nordic Unmanned</td>
<td>Lockheed Martin Indago</td>
<td>Active</td>
<td></td>
</tr>
</tbody>
</table>

* As at 10 October 2019

---

29. For further details please see documents released at https://www.asktheeu.org/en/request/evaluation_of_emsa_drone_operati
Table 2
EMSA drone operations 2018–2020 *

<table>
<thead>
<tr>
<th>Country</th>
<th>Months of operation</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>April to June 2019</td>
<td>Emission monitoring</td>
</tr>
<tr>
<td>Croatia</td>
<td>March to April 2019</td>
<td>General Maritime Surveillance</td>
</tr>
<tr>
<td>Croatia</td>
<td>July 2019–ongoing</td>
<td>General Maritime Surveillance</td>
</tr>
<tr>
<td>Frontex</td>
<td>October to December 2019</td>
<td>General Maritime Surveillance /Border monitoring - from Greece</td>
</tr>
<tr>
<td>Iceland</td>
<td>April to August 2019</td>
<td>General Maritime Surveillance</td>
</tr>
<tr>
<td>Italy</td>
<td>July to August 2019 (suspended)</td>
<td>General Maritime Surveillance</td>
</tr>
<tr>
<td>Portugal</td>
<td>January to March 2018</td>
<td>General Maritime Surveillance</td>
</tr>
<tr>
<td>Portugal</td>
<td>September to November 2018</td>
<td>General Maritime Surveillance</td>
</tr>
<tr>
<td>Portugal</td>
<td>March to May 2019</td>
<td>General Maritime Surveillance</td>
</tr>
<tr>
<td>Spain</td>
<td>October 2018 to February 2019</td>
<td>General Maritime Surveillance</td>
</tr>
<tr>
<td>EFCA</td>
<td>September 2019 to December 2019</td>
<td>General Maritime Surveillance / Fishery control in the Mediterranean and Atlantic</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>Formal request received for operations in 2020</td>
<td>Maritime surveillance and Emission monitoring</td>
</tr>
<tr>
<td>France</td>
<td>Formal request received for operations in 2020</td>
<td>Maritime surveillance and Emission monitoring</td>
</tr>
<tr>
<td>Greece</td>
<td>Formal request received for operations in 2020</td>
<td>Emission monitoring</td>
</tr>
<tr>
<td>Lithuania</td>
<td>Formal request received for operations in 2020</td>
<td>Emission monitoring</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Formal request received for operations in 2020</td>
<td>Emission monitoring</td>
</tr>
<tr>
<td>Portugal</td>
<td>Formal request received for operations in 2020</td>
<td>Emission monitoring</td>
</tr>
<tr>
<td>Spain</td>
<td>Formal request received for operations in 2020</td>
<td>Maritime Surveillance and Emission monitoring</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Formal request received for operations in 2020</td>
<td>Maritime Surveillance and Emission monitoring</td>
</tr>
</tbody>
</table>

* As of 10 October 2019. EMSA expected to receive further requests from EU member states and agencies for 2020-21.

Frontex: Europe’s border enforcers

Frontex, the European Border and Coastguard Agency, had its origins in 2004 as the European Agency for the Management of Operational Cooperation at the External Borders. In 2016 its remit was extended and it became responsible for ensuring “safe and well-functioning external borders providing security”, working alongside member states’ border agencies to control entry into the Schengen Area. 36

In response to enquiries from Drone Wars UK, the European Border and Coast Guard Agency, Frontex, merely stated that “Frontex is not currently using drones in its operations” and refused requests to allow an interview with a Frontex spokesperson. Our formal requests for information to Frontex were also obstructed and have been referred to the European Ombudsman by Drone Wars. 37 The agency has been accused of having a “culture of secrecy” 38 and its operations have been criticised as “lacking accountability for human rights violations.” 39 Frontex has been accused of complicity in dangerous and illegal ‘pushbacks’ in the Aegean Sea intended to force refugees back across the Greek

35 The Department of Transport has subsequently stated that no bid was submitted to the European Maritime Safety Agency by the Maritime and Costguard Agency in 2020.
37 See request history at https://www.asktheeu.org/en/request/evaluation_of_frontex_drone_oper

Evidence presented by a group of media organisations has documented a number of incidents where Frontex vessels directly participated in pushbacks and failed to rescue people from boats in distress, as well as systematic failures of the agency’s procedures for reporting human rights violations. The evidence included video footage showing a Frontex ship manoeuvring dangerously near a crowded dinghy full of people to create waves to drive the boat back. Following an intervention from Ylva Johansson, EU Commissioner for Home Affairs, Frontex was forced to launch an internal inquiry into the incidents.\footnote{’Frontex launches internal inquiry into incidents recently reported by media’. News Release, Frontex, 27 October 2020. https://frontex.europa.eu/media-centre/news-release/frontex-launches-internal-inquiry-into-incidents-recently-reported-by-media-ZtuEBP}

Despite Frontex’s claim not to be currently using drones in its operations, the Agency’s website mentions a number of cases in which drones have been used in Frontex operations. On occasion these have been provided by EMSA or EU member states. According to a news release on the website Frontex began testing the use of drones equipped with surveillance cameras and radars to monitor the EU’s external borders in September 2018, trialling an Elbit Hermes 900 drone in Portugal and larger long endurance drones in Greece and Italy. In Portugal Frontex worked with the EMSA, which provided the Hermes 900 drone, and the Portuguese Guarda Nacional Republicana, Navy and Air Force to monitor the North Atlantic Ocean, sharing information in real time. Operations were coordinated from the Frontex Situational Centre in Poland.\footnote{’Frontex begins testing unmanned aircraft for border surveillance’. Frontex news release, 27 September 2018. https://frontex.europa.eu/media-centre/news-release/frontex-begins-testing-unmanned-aircraft-for-border-surveillance-ZSQ26A}

\begin{figure}
\centering
\includegraphics[width=\textwidth]{Screenshot_from_surveillance_video_of_people_attempting_to_cross_the_Mediterranean_Sea_Credit_Frontex.png}
\caption{Screenshot from surveillance video of people attempting to cross the Mediterranean Sea \textit{Credit} Frontex}
\end{figure}
During the trials in Italy, which commenced in December 2018 and lasted through the summer of 2019, Frontex used a Leonardo Falco EVO drone to support operations in the Mediterranean Sea, flying from the Italian island of Lampedusa. The drone was used to observe boats transporting people across the sea as part of an enforcement programme planned by the Italian authorities. The drone was owned, maintained, and operated by Leonardo crews under a service arrangement valued at €1.7 million. The trials in Greece took place in cooperation with the Hellenic Coast Guard and the Hellenic Civil Aviation Authority and Air Force using an Israel Aerospace Industries Heron 1 drone operated and maintained by Airbus through a contract valued at just under €5 million. The drone flew from Crete, patrolling mainly in the Aegean Sea.

Frontex again provided support to the Greek government in September 2020, following attempts by refugees and asylum seekers in Turkey to cross the border between the two countries. Frontex provided 150 border control officers, four drones for aerial surveillance, and armoured jeeps, thermal cameras, and inflatable boats to back up 1000 Greek police officers in the Evros border region. During further operations in the Aegean a Hermes 900 drone operated by CeiiA under contract to EMSA which was conducting operations for Frontex crashed on take-off from Tympaki airport in Crete in January 2020 and was badly damaged. Flights using this type of aircraft were halted pending an investigation into the cause of the accident.

From 2016 Frontex has been co-operating with NATO on operations in the Aegean Sea. Under the co-operation arrangements the two organisations exchange information in real time between Frontex’s Operation Poseidon Rapid Intervention and NATO’s Operation Sea Guardian, which are taking place


over a common area.47 At the commencement of Sea Guardian, which is led by Allied Maritime Command (MARCOM) in Northwood, United Kingdom, a NATO spokesperson stated that NATO RQ-4 Global Hawk drones operating from Sigonella Air Base in Italy would “very likely” play a role in the operation, and a June 2020 infographic summarising the Operation’s successes shows a photograph of a Global Hawk drone.49

At the end of 2019 Frontex invited tenders for a two year contract valued at €50 million for aerial maritime surveillance services to be conducted using MALE drones.50 The service was to be delivered in Greece and / or Italy and / or Malta, with the contractor providing all necessary resources (i.e. flying and maintaining the aircraft) and proving Frontex with real time live stream sensor data from the drone. The drones were required to fly in all weather conditions and at day and night and operate in airspace where civil aircraft were also in service. According to tender documents the drones were to operate in the Eastern and Central Mediterranean Sea within a radius of up to 250 nautical miles, allowing them to monitor the seas in the ‘pre-frontier’ area of interest to Eurosur off the coast of Libya, Tunisia, and Egypt. Two contracts for the service were awarded in October 2020: one to Airbus Defence and Space Airborne Solutions operating an Israel Aerospace Industries Heron 1 drone and one to Elbit Systems Ltd to fly a Hermes 900 drone.51

The European Fisheries Control Agency (EFCA) has a range of operational capabilities, including patrol vessels, which are available for multi-purpose operations in cooperation with Frontex, EMSA, and member states in support of their coastguard functions. Although the primary role for these assets is fisheries inspection and control, support roles include search and rescue, border and customs control, and law enforcement.

EFCA appears to be at an early stage in developing its use of drones. Over the period September–December 2019 EFCA trialled the use of drone operations from an offshore patrol vessel in a joint project with EMSA. Trials took place in the Mediterranean, North Atlantic, Gulf of Biscay, North Sea, and Baltic Sea. A small short-range quadcopter, the Lockheed Martin Indago, was used under contract for close range viewing of fishing boats in the vicinity of the patrol vessel. Flights continued during the summer of 2020.52

Individual EU member states have also made use of drones for border surveillance purposes. The Italian government has flown its military Predator drones in support of EU border control operations in the Mediterranean.53 From 2019 two unarmed Italian Predator drones are reported to have flown as part of Operation Sophia for 60 hours per month. Officially, the drones are flown to observe from the air whether training of the Libyan coastguard has been successful, but presumably action is also taken to deal with any suspicious
activities observed by the drones. The Swiss, Italian and French governments have also used small drones along Italy’s northern border with Switzerland and France in order to detect migrants who are trying to get to northern Europe and send them back to processing centres in Italy.

Greece’s Hellenic Ministry of National Defense is also planning to introduce drones for border operations. The Ministry will lease long-endurance Heron drones from their manufacturer, Israel Aerospace Industries, with an option to purchase them after the three-year lease period ends. The drones will be supplied in a maritime configuration with a sensor and communications package suitable for monitoring Greece’s extensive coastal waters.

Automating Europe’s borders

Research on the further use of drones and unmanned systems for border control is being financed by the EU Commission through the ROBORDER security research project. The project is funded through the ‘Horizon 2020’ framework programme for security research, with tests arranged in several member States. In Hungary research is underway on the use of an unmanned ground vehicle to secure land borders with a vehicle built by the Spanish company Robotnik which is able to launch a small drone. In Greece a long-range Tekever drone and a surveillance aircraft have been trialled in the Aegean Sea, and in Portugal a seagoing drone boat and an underwater drone have been tested in the Atlantic. Eventually it is envisaged that surveillance drones could operate either independently or in swarms, with data from various sensors transmitted to a mobile situation centre where software would be able to detect illegal border activities and automatically classify people and objects, with information subsequently being passed to Frontex headquarters and feeding into the Eurosur system.

The aim of the project is evidently to develop technology similar to the ‘smart wall’ technology which is being installed along the US-Mexico border. “The main objective is to have as many sensors in the field as possible to assist patrol personnel,” said Kostas Ioannidis, the ROBORDER project’s technical manager.

- ROBORDER has apparently generated interest in the private sector, giving rise to the possibility that technology developed by the project’s private sector partners will eventually be sold outside the EU. “Eventually, we have companies that would certainly like to exploit this commercially,” Stefanos Vrochidis, ROBORDER’s project manager, told The Intercept website. “They might exploit the whole outcome or part of the outcome, depending. They can exploit this in Europe but also outside of Europe.” However, there are concerns that the technology may also be used for

---


57. Tekever subsequently withdrew from the ROBORDER project for unspecified reasons.


The use of drones to control borders

In another research project funded through the Horizon programme, Frontex is investigating the development of a concept of operations for manned and unmanned assets for maritime surveillance. The COMPASS2020 project will trial aerial and underwater drones deployed from patrol ships or land bases and test a mission command and control system for integrating data from the drones with data from crewed assets. Its aims are to improve the capabilities of drones for maritime operations, including launch and recovery systems and new sensors, and develop software for data fusion, risk analysis, and automatic tasking of drones.

Despite the EU’s use of drones for maritime and border surveillance there remain concerns and questions regarding the use of drones for these purposes. From the outset, reservations were raised by some member states about plans to use drones for migrant surveillance when they were first unveiled by the European Commission. Germany thought it was “highly doubtful” that the EMSA was the right body to develop this programme since its expertise is in shipping rather than human migration, and suggested that the budget was “in no way proportionate to the expected additional budgetary resources and posts.”

- More serious concerns relate to the manner in which information from drone flights is used. Under current arrangements Operation Sophia, the EU’s programme for preventing people trafficking and irregular migration across the Mediterranean Sea, relies solely on air observation rather than rescue patrols at sea. Under international law the captain of a ship is obliged to provide assistance to people in distress at sea, regardless of the nationality or status of such persons. By monitoring the Mediterranean from the air, the EU and its member states can neatly side-step this obligation.

In order to refute the claim that it is simply leaving refugees to drown, the EU has funded the Libyan coastguard – a consortium of militia groups – with tens of millions of Euros to intercept suspected boats attempting the crossing and return refugees to detention camps in Libya where, according to non-government organisations (NGOs), they may face serious human rights abuses and being sold into slavery. A senior Libyan coastguard commander was arrested in October 2020 for human trafficking as part of a mafia-style criminal network. Humanitarian organisations working in the Mediterranean report that only the Libyan authorities are informed of boats in distress, even when charity or cargo ships are located in the area where the boats were spotted and are able to respond more rapidly, to prevent refugees from being rescued and landed at a safe port in Europe where they may claim asylum. Similar practices are employed in the Aegean Sea with the Turkish authorities.

---

Human rights organisations point out that such practices violate international law. In the first instance, people must not be returned to states where they are at risk of torture or other serious human rights violations. Secondly, images from drones cannot be used to ascertain who is a legal migrant, who is in need of protection, or who has no right to enter the EU. This needs to be done at a point of entry by humans. Collectively rejecting a boatload of people without providing opportunities on an individual basis to have a claim to asylum heard and assessed is also unlawful.\(^{67}\)

---


UK government agencies have begun to make use of drones for border patrol purposes although so far, efforts have focused mainly on a number of pilot schemes. One reason for this is that regulation of the UK’s busy airspace does not allow large drones to fly ‘beyond visual line of sight’ (BVLOS) for safety reasons. Unless specific permission has been granted by the Civil Aviation Authority (CAA), the UK’s airspace regulator, drones can only be flown beyond a visual line of sight in zones known as ‘segregated airspace’, which are reserved for a specific purpose and are not open to general air traffic. This places severe limits on the use of drones. The UK government, however, is keen to promote the use of drones as a stimulus to economic growth and is working to reform aviation regulations to allow drones to be used on a ‘business as usual’ basis. This requires the development of as yet unproven ‘detect and avoid’ technology.68

Following a period of uncertainty after the UK’s decision to leave the European Union, there is now greater clarity over how the UK’s borders will operate in future. In summer 2020 the government conducted consultation on its ‘2025 Border Strategy’ which set out its aspirations for the post-Brexit border. The strategy stated that the UK wishes “to take full advantage of new trading opportunities and free trade” but at the same time required “an ever more secure, resilient and efficient border, able to manage migration, prevent smuggling, protect the UK from terrorism and biosecurity threats, and enforce the controls needed to protect UK consumers, businesses and the environment.”69 (See Box 3)

Policing Britain’s borders

The UK government agency with principal responsibility for the enforcement of border controls is the UK Border Force, part of the Home Office. The Border Force currently has no dedicated air support capability of its own but buys in air support from other public sector organisations, notably the Maritime and Coastguard Agency (see below).70 Previously, Border Force had a contract

68 ‘Detect & Avoid Ecosystem For BVLOS in Non-Segregated Airspace. CAP 1861a, Civil Aviation Authority, October 2020. https://publicapps.caa.co.uk/docs/33/CAP%201861a%20DAA%20Annex%20to%20BVLOS%20Fundamentals.pdf
with Cobham Aviation Services for border surveillance of the English Channel using crewed aircraft operating from Bournemouth Airport. The contract was cancelled in January 2016 and the Home Office is now required call on aerial surveillance aircraft from elsewhere for specific tasks as and when they are needed.71

Box3
The UK’s Borders after Brexit.

“Our border is more than a line on a map. It is a combination of organisations, policies, processes and systems that control, monitor and protect physical crossings of people and goods into and out of the UK’s territory. There are more than 270 recognised crossing points and many other smaller entry points across the UK.”72

So states the draft ‘2025 UK Border Strategy’, which sets out the government’s view on how the UK’s border should operate in future. The strategy makes it clear that the government sees the purpose of the border as being to “manage flows of people and trade” and that private business should play a major role in controlling it, viewing private sector organisations as “integral to the operation of the border.”73

Security is at the heart of how the UK border will function. Among the strategic outcomes set out in the Border Strategy are:

- Detect and reduce threats as far as possible before they reach the border to ensure effective interventions and enforcement of controls at the right point in the journey.
- Reduce vulnerabilities at the border and within the UK’s territorial waters to reduce biosecurity threats and impede the ability of actors to smuggle people and goods into and out of the UK.
- Discourage and detect individuals who attempt to abuse or circumvent the UK’s migration system.
- Safeguard vulnerable individuals and reduce the risk to life to those attempting to cross the border illegally.74

The border will be “highly digitised and automated” and will be transformed to “bring together government’s collection, assurance and use of border data to provide a comprehensive and holistic view of data at the border.” This will require new legislation to allow data to be shared between government and business.75

The government also hopes to move border activities away from the actual frontier as much as possible, both for travellers and traders, by introducing arrangements for “upstream compliance” which will be conducted remotely and will presumably be the responsibility of those involved in arranging transport across the border, such as transport companies and hauliers.

The UK Border Force has trialled the use of a drone for surveillance of the English Channel from the end of 2019 into September 2020. An investigation by ‘Wired’ magazine revealed that a drone owned by the Portuguese defense and aerospace group Tekever had been flying from Lydd Airport in Kent. Flight tracking websites showed that an aircraft had been flying in search patterns along the Channel in the Dover area and further investigations revealed that it was a Tekever AR5 drone with tail number G-TEKV registered to Tekever’s UK office in Southampton. Airspace restrictions were introduced by the CAA covering a large area of sea stretching from Eastbourne to Margate, entering into force on 2 December 2019 and lasting until 31 March 2020, and the drone is believed to have been used in this zone to search for people attempting to cross the Channel from France by boat. In September 2020 the Home Office belatedly published a notice stating that it had awarded a contract for a “fixed wing UAS managed service to enhance maritime awareness” from November 2019 to March 2020 to Tekever Ltd.

The UK works closely with the French government to control movement across the Channel under the terms of a number of agreements signed since the opening of the Channel Tunnel. The 2018 Sandhurst Treaty between the two countries set out a number of initiatives for border control, including the establishment of a Joint Information and Coordination Centre in Calais for law enforcement officers and a €50 million financial support package from the UK for border control operations in France. Some of this money has paid for drones to patrol the coast of France, and the prefecture of Pas-de-Calais has trained gendarmes in piloting the hand-held drones for monitoring beaches to support

77 Morgan Meaker: ‘Here’s proof the UK is using drones to patrol the English Channel’. Wired, 10 January 2020. https://www.wired.co.uk/article/uk-drones-migrants-english-channel
The use of drones to control borders

Land patrols, helicopters and maritime patrols. Getlink, the company that operates the Channel Tunnel (formerly Groupe Eurotunnel) has also deployed two small drones equipped with long range thermal imaging cameras to support surveillance at the French end of the tunnel.

France and the UK submitted applications to the European Maritime Safety Agency for drone deployments in 2020, although the outcome of these applications is not known. In general, the picture for drone surveillance of the English Channel appears fragmented and irregular, with as yet no formal structure for routine drone flights in place.

Maritime surveillance: watching the seas

The Maritime and Coastguard Agency (MCA) is responsible for operating a pan-government aerial surveillance programme which, among other things, provides a border patrol capability on behalf of the UK Border Force. The service is provided under a contract with the aviation company 2Excel, which operates two customised King Air B-200 crewed fixed wing aircraft for the purpose. The aircraft are fitted with a state-of-the-art multi-spectral surveillance suite, including radar, high definition electro-optical sensors, an infra-red / ultra-violet line scanner and search and rescue direction finder and operate from a location in the centre of the UK at Doncaster-Sheffield airport.

Beechcraft King Air maritime surveillance aircraft operated by 2Excel for the Maritime and Coastguard Agency. Credit Leonardo

---


The MCA, which takes pains to point out that border control operations are outside its responsibilities, currently has no contracts for operating drones. However, the agency is extensively studying the use of drones for air sea rescue purposes to pave the way towards using them on a routine basis. If this is to go ahead, the current safety and regulatory restrictions which prevent drones from flying in airspace shared with crewed aircraft will need to be changed.

As part of the programme of work to allow drones to be integrated into unsegregated airspace, the government has set up a number of ‘Pathfinder’ projects to help develop technology and operating procedures to allow routine beyond visual line of sight drone operations. One of these projects is funded and led by the Maritime and Coastguard Agency and aims to deliver an integrated BVLOS operated drone in unsegregated, uncontrolled airspace to support UK search and rescue operations, as current arrangements would make it difficult to arrange for a drone to fly at short notice in an emergency response situation. “We want the operation of this to be routine. No need to go and ask for special permissions, just go and perform the mission,” according to Phil Hanson, the MCA’s aviation technical assurance manager.85 Interestingly, one of the stated objectives of the project is to “move public perception of drones from negative to positive by demonstrating their use in a life-saving application – “drones for good”.”86

In a preliminary twelve-month project which ended in 2019, MCA worked with military technology company QinetiQ to evaluate a range of small drones, both fixed and rotary wing, and different sensor types in various search and rescue scenarios. Drones flew from Llanbedr Airfield in North Wales and live imagery was fed back to MCA control room staff in the National Maritime Operations Centre at Fareham who were able to control the drone’s sensors and direct operations. Imagery and information was also shared with flight crew at Llanbedr and personnel at Southampton and London via a secure network. The project helped MCA to gain insights into the use of small drones in search and rescue missions and the real-time sharing of information from unmanned systems.87

In the follow-on project which commenced in September 2019 under the Pathfinder scheme, MCA engaged Elbit Systems UK to undertake a ‘drone demonstration and development’ research project valued at £990,000. Trials took place from Aberporth airport on the Welsh coast using a Hermes 900 maritime patrol drone with a range of different sensors and a smaller Skylark I-LEX drone, both provided by Elbit Systems and operated by Elbit staff. The project was part-funded by the Home Office and the Civil Aviation Authority, National Police Air Service (NPAS), and drone companies Inzpire and Aviation Systems Group also participated.

The project was intended to assess the potential use of drones for aerial surveillance – potentially to give an advance picture of an emergency situation to help in developing the best response – and to identify the regulatory challenges that need to be overcome before drones can operate safely in all types of airspace. Demonstration flights were conducted in restricted airspace in a military training area, where safety regulations were not a limiting factor, to test the drones’ ability to monitor large areas of sea and long coastlines, conduct effective search operations, and identify potential hazards.

The trial also included a series of simulated police aviation scenarios on behalf of NPAS to explore how drones can be used to support policing functions. The study was scheduled to have been completed by the end of 2020 and findings will be used to support recommendations for the future deployment of drones by MCA and NPAS.88

In a parallel initiative Bristow Search and Rescue, the provider of the HM Coastguard search and rescue helicopter service, worked with the Schiebel Group to test drones for search and rescue operations in both the maritime and land environments. Bristow operated a Schiebel S-100 rotary wing drone on behalf of MCA to evaluate its capabilities in a search-in-support-of-rescue role, flying from Caernarfon Airport in North Wales. The trial also investigated the potential to integrate drone technology safely into operations from an airport from which private and commercial air traffic flies.89 Airspace restrictions necessary for the trial to go ahead were imposed as an “urgent requirement” by the CAA “due to the impact of COVID-19 on some Search and Rescue functions.”90

These studies are intended to help pave the way towards implementing the MCA’s second-generation search and rescue contract. The agency’s current contract for search and rescue services with Bristow is coming to an end and in January 2021 MCA intends to tender for a new contract. The contract will replace all aviation services currently under contract to MCA including “the existing aerial surveillance programme contract on behalf of wider government which provides for border patrol, fishery and anti-pollution protective measures, or police and counter-terrorism services”.91

According to Damien Oliver, MCA’s Commercial and Programme Director in charge of the tender process, “we certainly see a role for unmanned aircraft in our future and we’re working to create the rules under which that can happen”.92 The new contract will be let in three ‘lots’, with the third lot covering a “fixed-wing and potentially UAV, rapid search only, surveillance and pollution response.” The service will work under the Civil Aviation Authority’s current regulatory framework for search and rescue operations, but with the potential for including “innovation in aviation technology, such as Unmanned Aerial Vehicles”.93 MCA’s future search and rescue contract therefore looks likely to introduce the use of drones for a number of purposes, including border patrol work.

---


ARPAS: ‘Coastguard to trial the use of drones in rescue missions’ https://www.arpas.uk/coastguard-to-trial-the-use-of-drones-in-rescue-missions/


90 Aeronautical Information Circular Y 055/2020 United Kingdom. NATS, 10 July 2020.


Military and police support

The UK military have been asked to assist with border control operations in the English Channel during times of perceived crisis. Rey Koslowski and Marcus Schulzke point out that “it is often important to politicians to demonstrate to voters that they are ‘doing something’ to control immigration”, and that actions to stop illegal border crossings “are highly visible and make for wonderful ‘symbolic politics’.” This approach has long shaped border control policy making, and is exemplified by the highly publicised deployment of military assets in the Channel by the UK government. In August 2020 the government controversially considered calling in the Royal Navy to support the UK Border Force in the Channel in undertaking unlawful ‘pushback’ operations to return people crossing the Channel to France, but instead eventually deployed Royal Air Force crewed aircraft to assist with search operations, representing the first time that military aircraft have flown in support of the Border Force. Initially this consisted of support from a low-flying A400M Atlas transport aircraft, subsequently replaced by P8-Poseidon MRA1 marine patrol aircraft and Shadow R1 surveillance aircraft.

Just over two weeks later the Army’s Watchkeeper drone was deployed to patrol the Channel, operating from Lydd Airport in support of the Border Force amid speculation that, if successful, the trial could become a permanent tool in the government’s border control machinery. However, Watchkeeper drones have crashed a number of times during development and their flight is highly weather dependent and restricted to certain conditions, raising questions about how much practical value they will be able to provide. Watchkeeper took its first operational flight in support of the UK Border Force on 2 September 2020, undertaking 15 sorties with a total flight time just short of 44 hours during the month of September 2020. In the following month, October, the number of sorties was down to six, with a flight time totalling slightly under 24 hours. The drones were only permitted to fly in areas covered by temporary airspace restrictions.

The Royal Air Force is planning to bring its new Protector drone into service from 2024 onwards to replace its current Reaper fleet of armed drones. Some of the Protector aircraft will be based at RAF Waddington in Lincolnshire and the Ministry of Defence has stated that if requested, Protector would be available to support civilian agencies in the UK, for example in search and rescue and disaster response missions. In the light of the use of Watchkeeper over the Channel, this support role may include assistance for border patrol operations.¹⁰²

The police also have a role in border enforcement and local police forces are involved in various border control initiatives. Many police forces have purchased their own small drones and in 2017 the National Police Air Service (NPAS) considered a proposal for air support capacity in the form of a large helicopter and a large drone for coastal surveillance duties. The proposal was abandoned before a bid for funding was submitted. Should larger drones operating beyond visual line of sight be authorised for use by the police, it is likely that they would be operated by NPAS rather than by local forces.¹⁰³

Kent Police, which polices the landfall for the Channel crossing zone, is heavily involved in efforts to control the border at the English Channel, and is part of the Kent Multi-Agency Hub which brings together officers from the police, National Crime Agency, Border Force, Her Majesty’s Revenue and Customs and...


Immigration and Enforcement to share and analyse intelligence.\textsuperscript{104} Kent Police has been involved in various partnerships to investigate the use of drones for border control, among other purposes.

Along with Essex and Merseyside Police, the Borders and Immigration Agency (now the UK Border Force), and the Serious Organised Crime Agency (now the National Crime Agency), Kent Police was involved in a project called the South Coast Partnership which ran from 2007 to 2010. The aim of the Home Office-led project was to investigate the use of drones for law enforcement purposes, including border control. Ostensibly focusing on the seaway between England and France, in practice the project would have undertaken a wide range of potential covert surveillance activities along the south coast. It collapsed in 2010 when BAE Systems, which was to have provided the necessary drones, withdrew support.\textsuperscript{105}

Kent Police was also one of 16 participants in a collaborative EU-funded project involving research institutions and governmental authorities from England, France and the Netherlands which was intended to “stimulate the use and public acceptability of unmanned aerial vehicles for maritime security and safety operations.” The project, entitled ‘Integrated Coastal Zone Awareness via Increased Situational Awareness through Innovations on Unmanned Aircraft Systems’ (3i for short) aimed to build a prototype drone and fly it over the Channel and North Sea to contribute to knowledge on the use of drones for maritime security. Areas of interest included the use of the drone to monitor “the unexpected movements of small craft across frontiers (to smuggle commodities or people)” and “securing the borders from refugees.”\textsuperscript{106}

The Police Service of Northern Ireland (PSNI) is known to use drones to assist in searches for suspects and missing persons, but it is not known whether they are also used for purposes related to the UK–Republic of Ireland land border.\textsuperscript{107} PSNI has said that it has no plans to police checkpoints on the border following Brexit.\textsuperscript{108} However, PSNI is also a partner in the EU’s ROBORDER research project on the development of automated border control technology (see above). The force is involved in specifying user requirements and the demonstration and evaluation of project technology.\textsuperscript{109}

A brief survey conducted by Drone Wars UK using the Freedom of Information Act raises concerns about the openness and transparency with which government agencies would conduct border control operations using drones. We wrote to the Maritime and Coastguard Agency, the UK Border Force, eight police forces with major border entry ports within their jurisdiction, the National Police Air Service, and the National Police Chiefs’ Council to make requests under the Freedom of Information Act 2000 for the following information:

- A list of any programmes in which the agency is a participant for the use of drones for maritime surveillance and / or border control.
- A list of any contracts which the agency has for the use of drones for maritime surveillance and / or border control.

\begin{footnotesize}
\begin{itemize}
\end{itemize}
\end{footnotesize}
Of the twelve agencies which we contacted, only four were prepared to provide the requested information. The Maritime and Coastguard Agency confirmed it had no contracts for the operation of drones and provided details of feasibility studies it had undertaken with Israeli Aircraft Industries and Elbit Systems UK (see above). Sussex Police, Police Scotland, and the National Police Chiefs’ Council advised us that they were not engaged in any such programmes or contracts.

The UK Border Force, the National Police Air Service and the remaining six police forces (Kent Police, Hampshire Constabulary, Essex Police, Dyfed Powys Police, North Wales Police, and the Police Service Northern Ireland) all informed us in similarly worded responses that they would neither confirm nor deny whether they were engaged in any programmes or contracts for the use of drones for maritime surveillance and / or border control on the grounds that doing so might prejudice national security and law enforcement.

In summary, the United Kingdom does not yet use drones on a routine basis to control its borders. However, there is considerable interest within government in the everyday use of drones for commercial and surveillance purposes. A number of pilot projects are under way, and if the necessary regulatory approvals can be gained it appears likely that drones will begin patrolling the seas around the UK for border patrol and other purposes by the middle of this decade. On the basis of our Freedom of Information survey it appears likely that the public will be provided with little information about this, or the implications for their privacy.
China has the longest land border of any nation in the world. Its inland borders are mostly in mountainous, cold regions which are difficult to garrison. China has complicated relationships with many of its neighbours and at present its borders with Bhutan, Burma, India, Mongolia, North Korea, and Pakistan are all to some extent disputed. In addition, China has contesting territorial claims with South Korea, Japan, the Philippines, Brunei, Malaysia, and Indonesia over waters in the South China and East China Seas.

Historically, one of China’s top foreign policy priorities has been to maintain its territorial integrity and deter, or if necessary, defeat, the threat of invasion. Some of China’s neighbours are unstable states and China also has concerns over stability in some of its own border regions. Border security is therefore a high priority for China and policy is focused on maintaining stability along its borders and exploiting opportunities for economic exchange across the territorial borders it shares with other sovereign states.\(^\text{110}\)

Given China’s advanced drone manufacturing capability and lengthy, rugged borders it is not surprising that the Chinese government is making use of drones to monitor and police its borders. China’s People’s Liberation Army and People’s Armed Police Force use drones to conduct border patrol missions in sensitive areas in Xinjiang province in the northwest of China, which borders Pakistan, Afghanistan, and Tajikistan, and Yunnan province in the south, which borders Burma and Laos. The drones are able to cover large areas of territory and supplement other border protection measures such as fences, surveillance cameras, and armed troops. Large military reconnaissance drones such as the Harbin BZK-005 and the Cai Hong CH-4 and Wing Loong GJ-2 drones – both similar to the US Predator drone – have reportedly been used to monitor borders in the Xinjiang Uyghur Autonomous Region.\(^\text{111}\)

Drones also appear to be part of integrated border monitoring systems consisting of electro-optical and acoustic sensors, image analysers, radar, and command, control, and communications equipment which cover the Indian border with Tibet and other regions. The systems are capable of all-
weather surveillance and automatically notify patrol teams if intruders are detected. “Our system has been adopted by border defence units in Xinjiang, Tibet, Yunnan and many other regions to curb illegal border crossings and drug trafficking,” according to Mao Weichen of the Southwestern Institute of Technology and Physics, which designed the integrated system. The system can also be equipped with sea-scanning radar for use in coastal monitoring.112

China has recently developed a military drone which, according to official media outlets, will help to patrol China’s mountainous border with India, where there have been a number of confrontations between the two nations over recent years. The Global Times, a nationalist daily newspaper owned by the Chinese Communist Party’s People’s Daily newspaper, has reported that the state-owned Aviation Industry Corporation of China has developed an unmanned helicopter designed to fly in mountainous areas on “plateau operations.” According to the Global Times the AR500C drone is “capable of conducting missions including reconnaissance, communication relay, electronic disruption and fire strike at high altitude” and “could help safeguard China’s southwestern borders with India.” The drone has specially designed rotors and an advanced high-power engine to assist flight in thin air at high altitudes and, as it is a helicopter, does not need a large airstrip to deploy.113

The AR500C was unveiled in May 2020, shortly after China-India border tensions flared up following an incident in the Galwan Valley in the Himalayas – the location of the 1962 Sino-Indian war. A confrontation between Chinese and Indian troops also took place in 2017 at the border with Bhutan.

The drone is expected to be used to patrol locations that are difficult for infantry troops to reach on foot. A similar-looking aircraft was also sighted on board a People’s Liberation Army Navy amphibious assault ship in July 2020 – a type of ship which, according to the Global Times, is “expected to play a vital role in missions such as safeguarding of territorial integrity and national sovereignty in areas like Taiwan Island and the South China Sea.”114

India, too, has acquired drones for high altitude surveillance and reconnaissance over hard-to-reach areas and contested border territory. India has developed the Bharat quadcopter for surveillance of border areas near Ladakh115 and purchased larger drones from Israel Aerospace Industries, including the Heron drone and the smaller Searcher (which is not suitable for use at high altitudes). India is also reported to be planning to purchase US Reaper drones in the near future116 and is developing its own indigenous Rustom MALE attack drones, though these are several years away from entry into service.117

The use of drones in sensitive, contested areas by two major powers raises risks of provocation and conflict escalation. A crisis could conceivably be triggered by a drone flight which, either inadvertently or deliberately, entered air space claimed by a rival. In such an event it will not necessarily be easy to establish the purpose of the mission, nor the origin of the drone. These factors will make it difficult to formulate a response to such an incursion. As yet it is unlikely that many states have developed doctrine or rules of engagement to guide how to respond to an incident of this kind. Unintended military escalation must therefore be reckoned as a potential consequence of the use of drones in sensitive border areas.
The armistice which ended the Korean War in 1953 established the Korean Demilitarized Zone (DMZ), a buffer zone between the Republic of Korea (South Korea) and the Democratic People’s Republic of Korea (North Korea) that intersects the 38th parallel. The armistice led to a ceasefire between the two states but did not result in a peace treaty, and both states continue to claim to be the sole legitimate government for the whole of Korea. Border tensions between the two states remain high and as a result the Korean border is one of the most militarized borders in the world. On the South Korean side, the South Korean Army has installed a high security boundary system to the south of the DMZ, with a comprehensive network of high-performance surveillance cameras, optical fibre networks, and autonomous sentry guns which can automatically alert a situation room if an infringement of the DMZ is detected, allowing a rapid military reaction.\(^{118}\)

Both North and South Korea use drones as part of their border security apparatus and for reconnaissance purposes. The US armed forces, which have a strong presence in South Korea, have also deployed Gray Eagle drones in South Korea to provide intelligence, surveillance, and reconnaissance capabilities to American and South Korean forces.\(^{119}\) Drones can provide real-time images to help understand enemy activities, giving warning of potential attacks and also allowing non-threatening actions such as routine troop movements to be recognised as such. They are therefore valued by both sides in the Korean stand-off.

The use of military drones in Korea began in the early 1970s, when US AQM-34 Firebee drones flew missions along the costs of North Korea to monitor communications. In 1988 the South Korean Ministry of National Defence (MND) announced that it was seeking finance to build a fleet of reconnaissance drones. At roughly the same time North Korea acquired its first drones from China, and in the early 1990s began a domestic drone development and production programme based around Chinese drone technology. In 1994 Syria is believed to have provided North Korea with Russian manufactured drones and information on their operation, and by


the early 2000s North Korea was believed to be manufacturing small numbers of its own Panghyon reconnaissance drones based on the Chinese D4 drone, and was using them to conduct reconnaissance operations along the DMZ and in the Yellow Sea. As of 2014 North Korea was believed to have a drone force of around 300 aircraft of at least seven different types, which are relatively unsophisticated in nature, and was continuing to develop its own drones and continue efforts to acquire drones and drone technology from China, Russia, and sources in the Middle East.120

North Korea now appears to be using drones to mount an aggressive reconnaissance effort along the DMZ and into South Korea. Over recent years there have been a string of incidents where drones believed to have been launched from North Korea have crashed in the South and have been recovered and examined by the South Korean authorities:

Box 4
North Korea’s drone surveillance operations

A number of incidents have been documented where North Korean drones have apparently entered into South Korean airspace:121

- In October 2013 local residents discovered the wreckage of a crashed Taiyuan Sky-09P drone on a mountain near the east coast city of Samcheok.
- In March 2014 a North Korean drone crashed on March near the city of Paju, just east of the DMZ. The drone, which took approximately 200 photographs, had followed a flight path over military installations and central Seoul, including the presidential compound.
- In May 2014 South Korean air defences spotted a North Korean reconnaissance drone at Baengnyeong Island and tried to shoot it down. A local resident later discovered the remains of the crashed drone on the island.
- In September 2015 South Korea triggered an anti-aircraft warning and sent an attack helicopter and fighter jet to track down a drone that had crossed the border, without success.
- In January 2016 South Korean soldiers fired shots at a suspected North Korean drone that crossed into the sensitive Western part of the DMZ.
- In May 2017 South Korean troops fired on a drone that crossed the DMZ from North Korea and was detected in Southern airspace in the eastern province of Gangwon.
- In June 2017 a drone believed to have been sent from North Korea crashed near the border in South Korea’s Inje province. Photos recovered from the aircraft are said to have included images of the US missile defence site at Seongju.

The South Korean government has concluded that there have been numerous undetected North Korean drone flights over South Korea and in response is developing counter-drone swarm technology. On behalf of the South Korean military, the Korea Advanced Institute of Science and Technology (KAIST) is developing ‘attack drones’ which can work in combination to down an enemy drone as well as undertake conventional reconnaissance missions. The South Korean army plans to set up a special organisation to lead the development of swarms of weaponised ‘dronebots’ and a combat unit to operate the drones, established with technical support from the US and Israel. South Korea also undertakes reconnaissance operations to observe activities in North Korea using both drones and crewed ISR aircraft. South Korean arms companies have developed a number of military drones, including Korea Aerospace Industry’s RQ-101 Songgolmae (Falcon) reconnaissance drone, which is reportedly capable of taking photographs inside North Korea without crossing the border; Korean Air’s more modern KUS series drones; and the smaller Uconsystem Remoeye series of surveillance drones, all of which are in service with the South Korean armed forces. The South Korean Army also operates Israel Aerospace Industries Heron and Searcher 2 drones. The Agency for Defense Development is reportedly developing an armed MALE drone which is similar to the US MQ-9 Reaper. South Korea is able to draw on its position as one of the world’s technological leaders in developing its latest drones, which are reported to make use of advanced stealth technology, sensors, and command and control systems.
At sea the South Korean military has deployed Schiebel Camcopter S-100 drones, the Songgolmae drone, and manned reconnaissance aircraft to improve maritime intelligence, surveillance and reconnaissance capabilities to detect possible North Korean military incursions into its waters.\textsuperscript{126}

The South Korean Air Force has also purchased four advanced Northrop Grumman RQ4 Global Hawk surveillance drones from the United States, despite strong opposition from North Korea. All four aircraft have now been delivered and are believed to be operating from Sancheon Air Base in the south of the country.\textsuperscript{127} The Global Hawk is capable of performing extended reconnaissance missions for around 40 hours at a time at an altitude of roughly 20 kilometres, and its sensors can perform tasks to a range of up to 3,000 km. South Korea's Global Hawks are expected to be able to maintain round-the-clock surveillance of the whole of North Korea and some areas of China and Russia, and provide near real time intelligence to South Korea and the US.\textsuperscript{128}

The use of drones in the context of hostilities over the Korean border raises issues around the legitimacy of using drones for surveillance flights to reconnoitre another nation's territory and the response to a drone incursion across a border, especially if it is unclear whether the drone is undertaking a reconnaissance or strike mission. The legal status of the Korean Peninsula and the uncertainty as to whether drones are operating in a wartime or peacetime situation adds to the risks of misunderstanding and escalation in such a situation.
Drones are used by Russia’s Federal Security Service (FSB) Border Guard Service to patrol Russia’s borders. According to the Border Guard Service’s head, Vladimir Kulishov, domestically produced drones are “actively used in protecting the state border” along with mobile tethered aerostat systems designated for control of remote border sections and the co-ordination of border patrols.

Kulishov has also said that the Border Guard Service is considering the use of medium scale and heavy drones with longer ranges and higher payloads to control borders in the remote Arctic and Far Eastern Seas, as they would allow distant, hard-to-access areas and areas of “active illegal activity” to be monitored and are considered less weather dependent than conventional aircraft. Russian manufacturers are exploring the possibility of manufacturing rotary wing drones capable of taking off and landing from ground stations and ships, specifically designed for Arctic weather conditions, for the Border Guard Service.¹²⁹

Russia is sensitive to the use of military drones and aircraft near its borders with NATO nations, which it claims are being used for reconnaissance purposes. The Russian state-controlled Sputnik news agency has complained that “NATO countries often send aircraft and drones to perform reconnaissance activities along Russia’s borders in the Baltic, in the Black Sea off Crimea and Krasnodar”, claiming that in the first week of August 2020 Russia detected six drones which were carrying out reconnaissance missions near its borders.¹³⁰ Similar reports appear regularly in the Russian state-controlled media.

The five NATO nations which border Russia – Estonia, Latvia, Lithuania, Norway, and Poland – are reported to operate only small ‘Class I’ military drones (less than 150 kg), although Poland is seeking to acquire four MALE drones and is currently considering purchase of either General Atomics MQ-9 Reaper drones or Elbit Hermes 900 drones.¹³¹ A more immediate concern to Russia, however, is the presence of US MQ-9 Reaper drones in Poland, which are deployed at Mirosławiec Air Base and became fully operational in March 2019. Reapers from Mirosławiec have also flown from Amari Air Base in Estonia.¹³² According

to the US Air Force the aircraft “as currently configured, are unarmed and are only used for (intelligence, surveillance and reconnaissance) in support of U.S. foreign policy security objectives and those of our regional partners.” Their mission is presumably aimed at watching and eavesdropping on Russian military movements along borders of the Russian enclave of Kaliningrad and in the Baltic Sea.133 Russian Deputy Foreign Minister Sergey Ryabkov has stated that “Moscow is concerned about a U.S.-Polish decision to send to Poland a squadron of unmanned aerial vehicles” in a step he viewed as “raising military tensions in Europe, particularly on NATO’s so-called eastern flank.”134 Russian politicians have also described flights of US RQ-4 Global Hawk drones in Ukrainian airspace near the occupied Crimean peninsula as a “provocation”.135 The flights, from Sigonella Air Force Base in Italy, have taken place since 2015 and are apparently intended to monitor Russian military activity in Ukraine and the Black Sea.136

Although Russian military forces have used drones in combat in Georgia, Ukraine, and Syria, limited information is available in the public domain on Russia’s drone capabilities. It appears, however, that Russia has not yet deployed drones capable of systematic intelligence-gathering operations along its borders with NATO member states.

A screenshot from a flight tracking website shows the flight path of a US Global Hawk drone into Ukraine and over the Black Sea

Credit The Aviationist / Flightradar24.com

Following the election of the Liberal-National Coalition government in 2013 the Australian government introduced measures intended to stop maritime arrivals of asylum seekers in Australia. ‘Operation Sovereign Borders’ - a border protection operation aimed at demonstrating a “zero tolerance” policy to “illegal maritime arrivals” - is a military-led enterprise co-ordinated by the Department of Home Affairs and the Australian Border Force. Elements of the operation include mandatory detention in offshore detention and processing facilities; turning back boats carrying asylum seekers; and the issue of temporary protection visas only to asylum seekers. Boats are intercepted outside Australian waters, allowing Australia to claim it has no obligation to accept individuals concerned. The Australian government has limited the release of information about tactics and intelligence used by the Operation Sovereign Borders task force in undertaking border protection operations in the interests of national security.\(^{137}\)

In March 2014 the Australian government announced plans to buy a fleet of Northrop Grumman MQ-4C Triton maritime surveillance drones.\(^{138}\) Originally designed and built for the US Navy, the Triton MALE drone is equipped with a sensor suite that provides a 360-degree view of its surroundings for over 2000 nautical miles. During a single flight the drone is said to be capable of watching more than two million square miles of ocean.\(^{139}\) Among the reasons stated for the purchase is the wish to patrol Australia’s borders to control attempts to enter the country illegally and to monitor energy resources and supply routes off Northern Australia.

Australia's Triton programme has suffered procurement problems and delays, and delivery of the first drone is now expected to take place in 2023, with two further drones scheduled to arrive by early 2025 and a long-term ambition to purchase up to seven of the drones.\(^{140}\) Triton will fly from a main operating

---


\(^{139}\) In practice the commander will have a choice between general surveillance across a wide area and more intensive persistent monitoring of a specific zone. ‘MQ-4C Triton Unmanned Aircraft System’. Royal Australian Air Force. https://www.airforce.gov.au/technology/aircraft/intelligence-surveillance-and-reconnaissance/mq-4c-triton-unmanned-aircraft

base at RAAF Edinburgh near Adelaide in South Australia, which will be its permanent control station, and a forward operating base at RAAF Tindal in the Northern Territory. Australia is expected to use the drones to patrol far over the Timor Sea and Indian Ocean.

The Australian government is also planning to spend $1.3 billion on the Maritime UAS Continuous Development programme, intended to ensure that Australia keeps up to date with unmanned maritime surveillance technology. Under the programme, commencing in 2024, Australia aims to acquire a range of drones varying between 25 and 300 kilograms. A five-yearly investment cycle is intended to ensure that capability is regularly updated to stay abreast of current trends.

Australia also has plans to use unmanned surface vehicles (USVs) to patrol inshore waters. The Royal Australian Navy has entered into a contract with OCIUS, manufacturer of the ‘Bluebottle’ USV, to undertake sea trials and development work for deployment of the sea drone for border protection and meteorological studies. The Bluebottle is a 6-metre long autonomous vehicle, powered by wind, waves, and sunlight, which can remain at sea for months and is equipped with 360-degree cameras, radar and sonar equipment, and automatic identification systems (AIS) able to autonomously detect vessels in a search area. Once a vessel is detected, a signal is sent back to an onshore operator who will investigate and undertake any necessary action. The drone is intended to “provide the Royal Australian Navy with a unique interoperable capability to help protect Australian maritime borders.”

During the trial Bluebottle USVs will patrol the waters of Australia’s exclusive economic zone, up to 200 km offshore. Under the contract, five Bluebottles will eventually be deployed in an intelligent networked squad to patrol three different areas of operations from 2021 onwards.

Internally, Australian police have been reported to have used drones to patrol state borders to enforce border closures during the COVID-19 pandemic. Border controls and closures were introduced as a quarantine measure to prevent spread of the virus, and in particular to control movement between Victoria, which has seen a relatively high number of infections, and other states.

Both the New South Wales police and South Australian police are reported to have considered using drones to monitor their state borders. South Australian Police Commissioner Grant Stevens stated that he had been in talks
with the Australian Defence Force as "one option" to assist police in staffing check points, with the use of drones also under consideration.\textsuperscript{144} New South Wales Police Commissioner confirmed the use of drones to guard the New South Wales–Victoria border, saying "We’ll be using drones and other aerial surveillance at the same time … There will be police. There will be aerial and other surveillance 24/7 right across the border."\textsuperscript{145} However, the Department of Defence is reported to have refused a request from the South Australia government to provide drone surveillance of the border with Victoria during the crisis.\textsuperscript{146}

The Australian response to border protection is notable for its involvement of military forces, and operation of drones for border control purposes by the military. This raises issues about the role of the military in border policing operations away from a combat zone, and the military’s relationship with civilian citizens crossing a border.

Although borders are controlled by states, non-state actors and non-government organisations (NGOs) have also used drones in border areas for both lawful and unlawful purposes.

Malicious uses of drones have been widely documented in the popular media. Drones have been used by armed non-state groups in the Middle East, and Hezbollah and Palestinian militant groups regularly send drones into Israeli airspace from their strongholds in Lebanon and Palestine. Although these drones are relatively unsophisticated, the threat of drone attacks is taken seriously by the Israeli military.147

Hezbollah first flew a drone from Lebanon into Israeli airspace for reconnaissance purposes in November 2004, and during the Lebanon war in August 2006 launched three drones each carrying explosive payloads into Israel. All three drones were shot down by the Israeli air force. In October 2012 Hezbollah succeeded in flying a drone over the Mediterranean Sea and into the Negev Desert via the Gaza Strip. The drone was shot down near the Israeli nuclear complex at Dimona and the Israeli military has stated that it was possible that it could have recorded and transmitted imagery of the complex.

Hezbollah’s drones tend to be relatively small and presumed provided by its partner Iran, which move at slow speed and low elevation but which, although difficult to detect by radar, have limited destructive capability. Initially sent to cause panic in Israel, they now appear to be used for reconnaissance purposes and for the propaganda value derived from their entry into Israeli airspace.148

Palestinian militant groups share common tactics and common goals with Hezbollah as well as close ties to Iran. These groups have used drones loaded with explosives to infiltrate Israeli airspace with the intention of conducting attacks deep inside Israel, but has so far not succeeded in causing any deaths through this approach. The militant group al-Qassem Brigade claims to have successfully manufactured its own Ababeel 1 drone, which was used in the...
2014 Gaza war. The Overland Crossing Authority of the Israeli Defense Ministry reported that between 2016 and 2018, 180 complete drones and 352 drone parts were seized at the Erez and Karem Shalmon border crossings into Palestine.  

Elsewhere the Houthi movement based in Yemen has also flown drones loaded with explosives across the border into Saudi Arabia to attack military sites, airports, and sensitive targets, and armed groups have used drones to smuggle weapons from Pakistan into Indian-controlled parts of Kashmir.

Not surprisingly, there is limited information in the public domain about the use of drones by organised criminal groups. In its Serious Organised Crime and Threat Assessment for 2017 the European law enforcement agency Europol warned that organised crime groups involved in drug trafficking “will likely invest in drone technology for trafficking purposes in order to avoid checks at border crossing points, ports and airports”. Mexican drug cartels began experimenting with drones to traffic drugs in 2010 and in 2012 an estimated 150 drones crossed the border into the US. Drones have also been used by the Clan del Golfo, considered to be the largest criminal gang in Colombia, to smuggle small shipments of drugs across the Colombian border into Panama.

In a thesis for the US Postgraduate Naval School, Aaron R. Schmersahl postulates that Mexican drug cartels could potentially use drones for three purposes: reconnaissance and surveillance, smuggling, and kinetic attack. The most common use of drones by the gangs is to gain real-time intelligence on the location and movement of border patrol and law enforcement officers and on any vulnerabilities in border security infrastructure, replacing human look-outs. Schmersahl lists a number of cases where drones have been used to smuggle drugs into the US, but points out that their restricted payload limits their use for this purpose, and notes that although weaponised drones believed to be connected to drug cartels have been found in Mexico, there is as yet no record of them being used to undertake attacks on border patrol officers or rival gangs.

As well as using drones for malicious purposes, non-state actors have also used drones for humanitarian purposes. In response to the failure of European states to fund search and rescue services to asylum seekers crossing the Mediterranean Sea, several NGOs undertook their own search and rescue operations. Among these was the Migrant Offshore Aid Station (MOAS) which used two Schiebel Camcopter S-100 drones to patrol a sea area close to Libya to spot boats in distress.


distress. People on the boats were rescued and given medical assistance before being disembarked safely in Italy. The drone manufacturer, Schiebel, provided staff to operate the drones and assisted in funding the programme and used the operation to promote itself, claiming that the Camcopters "assisted in the rescue of over 8,800 refugees" over five months of operation and helped MOAS "become the first civil organisation to use these high-tech helicopters for a great humanitarian purpose." The Spanish aid group Open Arms is testing a fixed wing drone to aid search and rescue operations in the Mediterranean Sea. The drone includes software that can detect if a ship is drifting and in distress, and sends an alert to a rescue ship.

Other uses of drones for border surveillance by non-state actors are more ambivalent. The American Border Patrol (ABP) describes itself as "the only non-governmental organization (NGO) that monitors the border on a regular basis – mostly by air" operating “from a ranch right on the Mexican border in Southeastern Arizona in the heart of a major smuggling corridor. ABP is a watchdog. We watch what the government is doing and we report to you directly." American Border Patrol first used webcams to show live video of illegal border crossings on the internet and then in 2003 began using a drone carrying a video camera for the same purpose, reporting sightings to the border patrol authorities. ABP’s drone flights received extensive media coverage and have been credited with prompting the US government to deploy its own drones along the border.

Media organizations have also used commercial drones to capture video film showing large numbers of asylum seekers crossing borders. For example, in 2015 the Daily Mail website hosted footage of people attempting to cross the border from Serbia into Hungary. With the emotive headline “Drone footage captures the tear gas, tanks, tents and sheer scale of the Hungarian border fence keeping desperate migrants out”, the film showed mistreatment of asylum seekers by Hungarian riot police.

The use of drones by non-state actors has helped to draw broader attention to border security issues. Drones operated by violent non-state actors and criminal groups exploit weaknesses in border security and directly undermine the sovereign authority of the state, both tangibly and symbolically. Organisations such as American Border Patrol and MOAS aim to support, rather than undermine, state functions. Although they have each used drone technology for very different purposes, both types of organisation seek to highlight inadequacies, as they perceive them, in the way borders are managed by sovereign states.

---


The use of drones to save the lives of refugees at sea, monitor potential human rights abuses, and verify compliance with agreements between bordering nations where relations are tense are potentially positive uses of drones at borders. As this report illustrates, however, the current reality is very different. Governments – the most powerful and influential players in border control – are using drones in ways which have negative implications for the rights of individuals and may even be placing them at increased risk. Whilst malicious non-state actors also use drones and are less likely to be constrained by scruples in their use of drones, non-state actors have more local and limited impacts than those of governments. Government defines policy, sets standards for human rights for others to follow, and creates the ethical climate in which technology is used.

That governments are using drones at national borders in ways which challenge human rights should come as no surprise. Illiberal right wing and nationalist politicians around the world have made border security and immigration central to their campaigns and policy agendas. According to their narrative national borders must be vigorously defended to prevent the entry of undeserving outsiders who will claim advantages from the state (such as employment, legal protections, and welfare benefits) to which they should not be entitled. Drones, as an intrinsically oppressive technology developed by the military to control and intimidate populations, are a perfect tool for enforcing such views.

We have seen drones not only being used at militarised borders, but also contributing to the militarisation of everyday borders as part of the broader process of ‘securitisation’ through technology. Drones are often used as part of an integrated set of technologies – satellites, sensors, smart walls – in border policing. The use of drones and advanced combat-derived technology for border control operations fits comfortably into a security paradigm where border control operations are heavily influenced by the military. Roughly a third of US Customs and Border Protection staff have previously served in the military, and in recruiting its border guards Frontex states that among the groups it seeks applications from are “military or equivalent (active and...

---

Many border security operations are modelled on low-intensity conflict doctrines and the weapons and tactics developed for these operations are also adopted in border security. Military forces have on occasion been called up to support border operations, through both the sharing of information and intelligence and through direct policing of borders.

Applying military approaches to border security, where the vast majority of those attempting to cross the border are not insurgents or soldiers but ordinary civilians, poses risks and raises clear human rights issues. Rey Koslowski and Marcus Schulzke, in their review of the use of drones for border security purposes in the US and EU, cite sources which highlight concerns that drones provide a detached and dehumanizing perspective on migrants that could facilitate efforts to characterize them as threats and legitimize violence against them. They point out that border patrol drones blur the boundaries between military combat and domestic policing in ways that could further the violent dehumanization and non-differentiation of people. As the concept of border security extends from the border and intrudes further into everyday life, the rights implications begin to affect not just migrant ‘outgroups’ but all citizens, introducing an invisible security apparatus that extends beyond state boundaries.

Another casualty of a militarist approach to border security is transparency. Even in nations which pride themselves on their liberal credentials, border security is considered to be an integral part of national security and is treated as a sensitive and secret matter. The results of the Freedom of Information surveys we conducted while researching this report leave no doubt that citizens will not be informed of decisions relating to border control technology and will not be allowed to have access to information about operations in which they may be being watched, followed, or eavesdropped on without their knowledge or consent.

On the basis of our findings, we highlight the following as particular risks resulting from the use of drones in border areas:

- The risk that drones will increasingly be used for surveillance of the wider population – not just those involved in criminal activities at borders - at ‘upstream’ internal border locations, and not just the geographically-defined border itself.
- The risk that the use of drones, as a primarily military technology, in border control will contribute to the dehumanisation of those attempting to cross borders and increase the potential for human rights abuses.
- The risk that states will use drones, as opposed to crewed aircraft and assets, to evade their humanitarian responsibilities to those in distress.
- The risk that information from unrelated surveillance activities (for example shipping control or traffic monitoring) is passed on to border control and other law enforcement agencies for inclusion into a broader ‘intelligence picture’.
- The risk that, if drones are deployed in a zone where there are border tensions between nations, there will be a blurring between military and policing roles and a temptation to use drones in spying or intrusion missions which may escalate tensions.

High-end security technologies such as drones and border surveillance networks act as a panacea for the consequences of a failure to manage irregular migration. They are symptoms of an approach to global problems which Paul Rogers, Professor of Peace Studies at the University of Bradford, has dubbed ‘liddism’\(^6\) – attempting to use military means to keep the lid on threats and control them rather than understand them and tackle their root causes. This approach is positioned firmly in a neoliberal political paradigm which emphasises the state’s role in the enforcement of security and limits political freedoms and freedom of movement, whilst maximising corporate and economic freedoms. The aim is to maintain the privileges enjoyed by elite groups. The ultimate outcome of this trajectory looks set to be a semi-military ‘security state’ where security is seen as the dominant role of the state, individual rights take second place to state authority, and the military/technical approach shapes a wide variety of government functions.

The UN’s special rapporteur on racism, racial discrimination, xenophobia and related intolerance, Prof Tendayi Achiume, has warned that the rise of ‘digital borders’ based on security technologies such as drones is “troubling”, can be unfair, and regularly results in human rights breaches. She points out that surveillance technologies are neither neutral nor objective and have unequal impacts on different groups, and has called for an immediate moratorium on the procurement, sale, transfer and use of surveillance technology until robust human rights safeguards are in place to regulate such practices.\(^4\) ‘Securitisation’ tactics are doomed to failure, and may even exacerbate problems and leave western nations more vulnerable. Drone Wars UK believes that a sustainable security\(^5\) approach to migration, which addresses the underlying causes of conflict, global poverty, and climate change, would be more successful and effective than a technologically based ‘national security’ approach.

Antonine Bousquet, in his book ‘The Eye of War’, writes of the ‘martial gaze’ – the increasing automation of perception through history which has been driven by military imperatives, and for which drones are a modern enabler.\(^6\) “Untethered from discrete spheres of armed conflict and committed to relentlessly pursuing individual antagonists”, he writes, “the martial gaze must inevitably cast itself on the very civilian society that it was ostensibly erected to defend from external threat”. The martial gaze singles out humans as targets on the basis of their interpersonal associations and patterns of behaviour and eventually, writes Bousquet, everyone falls under the martial gaze. The use of drones to police borders and broader society will have implications for everybody, not just ‘migrants’ from elsewhere.

---


# LIST OF ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABP</td>
<td>American Border Patrol</td>
</tr>
<tr>
<td>AIS</td>
<td>Automatic Identification System</td>
</tr>
<tr>
<td>AMO</td>
<td>Air and Marine Operations</td>
</tr>
<tr>
<td>BVLOS</td>
<td>Beyond Visual Line of Sight</td>
</tr>
<tr>
<td>CAA</td>
<td>Civil Aviation Authority</td>
</tr>
<tr>
<td>CBP</td>
<td>Customs and Border Protection</td>
</tr>
<tr>
<td>DMZ</td>
<td>Demilitarized Zone</td>
</tr>
<tr>
<td>EFCA</td>
<td>European Fisheries Control Agency</td>
</tr>
<tr>
<td>EFTA</td>
<td>European Free Trade Area</td>
</tr>
<tr>
<td>EMSA</td>
<td>European Maritime Surveillance Agency</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>EU NavFor Med</td>
<td>European Naval Force Mediterranean</td>
</tr>
<tr>
<td>Eurosur</td>
<td>European Border Surveillance System</td>
</tr>
<tr>
<td>FBI</td>
<td>Federal Bureau of Investigation</td>
</tr>
<tr>
<td>FLIR</td>
<td>Forward Looking Infrared</td>
</tr>
<tr>
<td>FSB</td>
<td>Federal Security Service of the Russian Federation</td>
</tr>
<tr>
<td>Frontex</td>
<td>European Border and Coastguard Agency</td>
</tr>
<tr>
<td>KAIST</td>
<td>Korea Advanced Institute of Science and Technology</td>
</tr>
<tr>
<td>MALE</td>
<td>Medium Altitude Long Endurance</td>
</tr>
<tr>
<td>MCA</td>
<td>Maritime and Coastguard Agency</td>
</tr>
<tr>
<td>MND</td>
<td>Ministry of National Defence</td>
</tr>
<tr>
<td>MOAS</td>
<td>Migrant Offshore Aid Station</td>
</tr>
<tr>
<td>NATO</td>
<td>North Atlantic Treaty Organisation</td>
</tr>
<tr>
<td>NCC</td>
<td>National Coordination Centre</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-government Organisation</td>
</tr>
<tr>
<td>NPAS</td>
<td>National Police Air Service</td>
</tr>
<tr>
<td>PSNI</td>
<td>Police Service of Northern Ireland</td>
</tr>
<tr>
<td>RAF</td>
<td>Royal Air Force</td>
</tr>
<tr>
<td>RAAF</td>
<td>Royal Australian Air Force</td>
</tr>
<tr>
<td>RPAS</td>
<td>Remotely Piloted Aircraft System</td>
</tr>
<tr>
<td>SBI Net</td>
<td>Secure Border Initiative Network</td>
</tr>
<tr>
<td>UAS</td>
<td>Unmanned Aircraft System</td>
</tr>
<tr>
<td>UAV</td>
<td>Unmanned Aerial Vehicle</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>US</td>
<td>United States</td>
</tr>
<tr>
<td>US</td>
<td>United States of America</td>
</tr>
<tr>
<td>USV</td>
<td>Unmanned Surface Vehicle</td>
</tr>
<tr>
<td>WAAS</td>
<td>Wide Area Airborne Surveillance</td>
</tr>
<tr>
<td>WAMI</td>
<td>Wide Area Motion Imagery</td>
</tr>
<tr>
<td>WAPS</td>
<td>Wide Area Persistent Surveillance</td>
</tr>
</tbody>
</table>