On patrol with Customs Coastwatch

Customs Coastwatch delivers Australia's civil maritime surveillance capability. Matt Wardell hopped aboard a routine surveillance flight off southern NSW coast to discover how this vital task is carried out.

Ask the uninitiated where Customs Coastwatch operates and you soon get the impression it's pretty much limited to northern Australia. After all, that's where prime threats to our borders seem to exist: illegal boat arrivals, drug importation, the ever-present quarantine risk and illegal fishing.

But Customs Coastwatch covers a much broader area.

Its brief is to provide a national surveillance service around all of Australia's 37,000km coastline and throughout its 12 million plus square kilometres of territorial waters. The invitation to join a flight covering waters off the NSW south coast with a crew from Surveillance Australia, the company which provides Customs with its civil maritime surveillance capability, comes in late one afternoon and by early next morning I'm climbing into a borrowed flame-retardant flight suit.

10:30 I meet the contracted crew at a sunny but very blustery Canberra airport. I put my overnight reading on flight meteorology to the test and speculate conditions could be "bumpy" aloft. Thankfully someone who actually knows what they're doing, Captain Mark Bonthorne, a Surveillance Australia veteran of seven years, is in command of the aircraft. Assisting up-front is First Officer Tas Mitsios, who has been flying in surveillance aircraft for two years.

Mission Coordinator Maurice

Simpson has planned our route based on our tasking for the day and once in the air will make the call on where to go and what to see as the flight develops.

Rounding out the standard four-person surveillance crew is Observer/Communications Officer Matt Reeve. Matt has an impressive array of comms gear at his fingertips, including radios of every description, a satellite phone and Customs Coastwatch's new Inmarsat high-speed data, voice and image link.

11:08 I join an on-board briefing at which the key objectives of the flight and operational matters are discussed. Importantly, for a novice like me, emergency procedures are also comprehensively covered.

Our tasking will take us out to and beyond the edge of Australia's Exclusive Economic Zone (EEZ), which extends to 200 nautical miles* (nm) beyond the mainland. We're on the lookout for foreign fishing vessels and in particular whales on behalf of our client agencies for the day, Environment Australia and the Australian Fisheries Management Authority.

Customs Coastwatch flies for a range of government agencies in the law enforcement, defence, immigration and environment areas. While each flight has a primary mission, Coastwatch will also detect and observe any other activities in the area and provide a comprehensive report in its post-flight briefing.

Our flight today is expected to take around six-and-a-half hours, covering almost 1200nm. The first leg is an 84nm "transit" sector to the start of our first surveillance run.

11.10 I don my lifejacket (a mandatory piece of clothing given Customs Coastwatch aircraft regularly descend to less than 1000 feet* above the ocean to identify vessels) and strap myself into a four point safety harness. Captain Bonthorne fires up the Dash 8's twin engines.

11:20 Coastwatch Flight 184 lifts smoothly from Canberra's runway 35 to the north, banking to the east and climbing through 7000ft to head for the coast.

11:30 Large bushfires are clearly visible in the national park behind Nowra on the NSW South Coast.

11:43 We cross the NSW coast just south of Nowra and maintain a heading out into the Tasman Sea. The crew take the opportunity to grab a bite to eat before we arrive on station and get down to the serious business of surveillance.

11:47 Cruising at an altitude of 25,000ft, Maurice announces the first radar contact, 62nm to our north - most likely a bulk carrier off Port Kembla. The digital radar system fitted in the Dash 8 can track up to 32 targets simultaneously at ranges up to 50nm, displaying the course, speed and position of each contact. If contact is lost, the system automatically continues to project a course and calculate a position until the target is reacquired. There's no escape for any vessel acting illegally.

12:00 Captain Bonthorne makes our first position report via HF radio. Customs Coastwatch planes report in to air traffic controllers every 30 minutes with their course and position. In case of an emergency, this information can be used in conjunction with a lodged flight plan to give rescue authorities a fair idea where to start looking.

12:25 More than 180nm off the coast and approaching the start of our surveillance run, the crew run through another checklist to ensure all systems are ready for action. The forward looking infra-red camera, digital television recorder and mission camera are checked, and we each verbally confirm we are seated and strapped in with life jackets on. I glance out the window and notice unbroken cloud below.

12:34 We descend through 11,000ft, heading for an initial operational level of 3000ft. Normal surveillance operations are carried out at altitudes between 2000 and 2500ft,

left: Customs Coastwatch training and standards manager, Kingsley Woodford-Smith (right), provides a pre-flight briefing to the author before the Tasman Sea surveillance flight.

above: Customs Coastwatch aircraft can accurately identify all types of shipping from altitudes as high at 5000 feet thanks to high definition digital television cameras mounted under the aircraft.

* Standard units of measurements for flight operations are: the nautical mile (approx 1.85km) for distance, and feet (5000ft = approx 1600m) for altitude.

depending on the sea state and the desired radar horizon - essentially, how far the radar can see. Maurice says radar performance is better in southern latitudes, where there is less humidity to distort the radar picture.

12:45 We're enveloped in cloud. Captain Bonthorne estimates the cloud base is as low as 500ft, which rules out cruising below it to maintain visual surveillance. Maurice requests a cruising altitude of 1500ft in order to conduct radar surveillance. We turn to the south-west to follow the outer edge of the EEZ on an intended 118nm surveillance track.

above: The cockpit of a Customs Coastwatch Dash-8 surveillance aircraft, home to a Surveillance Australia captain and first officer during flight.

top right: Surveillance Australia observer/communications officer Matt Reeve takes up station at the radar console. The highly sensitive equipment can track up to 32 targets simultaneously at ranges up to 50 nautical miles.

13:03 The Dash-8's surveillance radar also does a great job of picking up weather patterns as much as 50nm ahead. A sweep shows heavy cloud formations adjacent to our intended path.

13:05 The seatbelt sign is switched on, and for a moment its easy to pretend I'm on a normal commercial flight. But a few moments later the bumps begin in earnest. It's not alarming, but a little disconcerting. Unlike a commercial airliner the bumps do not cease as the plane climbs out of the turbulence.

13:10 The radar reveals a major storm cell right on our flight path. We climb to 3000ft to regain visual flight above the low cloud, and turn early onto a new heading which will take us further out to sea. Our target is an area of seamounts - areas where the ocean floor rises sharply to form underwater mountains - which are fertile fishing grounds.

13:16 The weather begins to close in, we are now flying with 100 percent cloud cover both above and below, but the crew is reassuringly unperturbed. Dash 8s can operate in all weather, and Coastwatch planes have been known to fly in almost cyclonic conditions when there is a tactical need. In consultation with Maurice, Captain Bonthorne decides to track around the cloud formations in our path, rather than trying to thread a course through them. I wholeheartedly agree.

13:27 We turn south. Despite the heavy weather our surveillance radar has a clear picture of the ocean below - it's empty. No fisherman, or any other vessel, within 50nm. With no targets and facing heavy weather, Maurice makes an executive decision to abandon our next waypoint (another seamount) and fly direct to the next surveillance run on our itinerary.

13:32 The Dash-8 begins to bounce around the sky as the turbulence picks up. There's a flash of lightning outside and I'm glad of the firm fit of my four-point harness and my snug lifejacket around my neck. There's no concern over the intercom - only a calm discussion of an alternate course of action. In an effort to avoid the worst of it we climb to 4500ft; the ride soon becomes smoother.

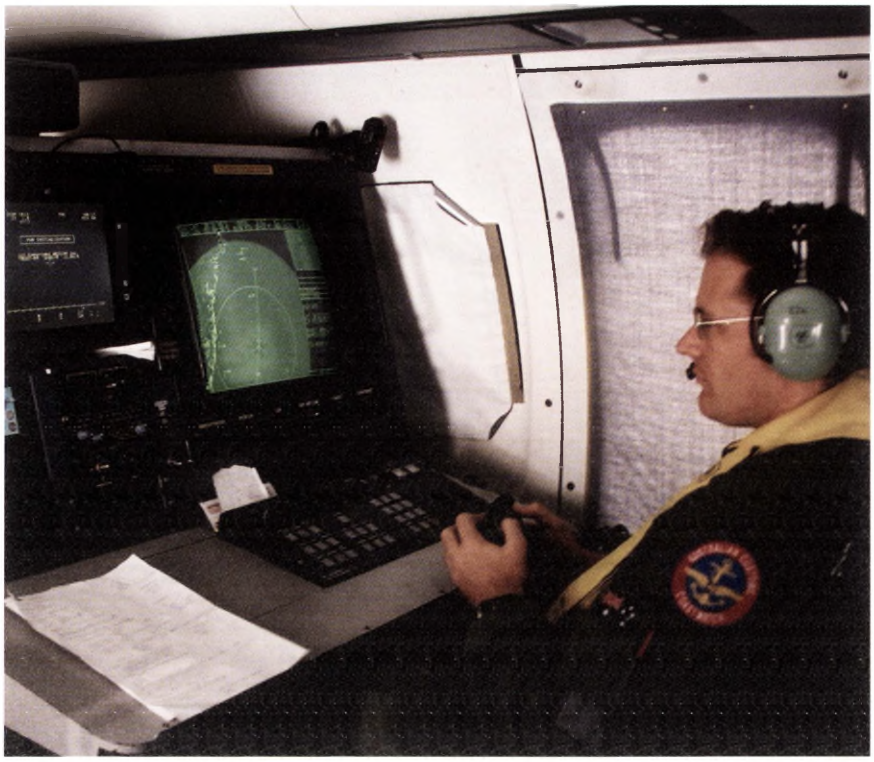
13:50 Almost 20 minutes later we leave the worst of the weather behind us, the low cloud clears, and for the first time I have a clear view of the ocean below. We descend again to 3000ft and track north-west, rejoining our originally plotted course. Clear skies can be deceiving and as I watch the sea state worsens noticeably, going from state one (calm) to state five (two-metre swells with blowing spray) in the face of the weather system we have just flown out of.

14:05 Mission coordinator Maurice and Observer communications officer Matt swap seats and roles, part of the multi-skilling of surveillance crews and to minimise the risk of task fatigue on long flights. This crew is flying together for five days before returning with the aircraft to its home base of Cairns.

14:25 We bank onto a new south-westerly heading, again flying parallel to the line of the outer edge of Australia's EEZ.

15:00 We pass Eden on the NSW South Coast, still heading south.

15:10 The radar makes a second contact of the flight, at a distance of 57nm. We break off our track, heading towards Mallacoota on the Victorian Coast to investigate. Although the contact is inshore, we



secure the cabin for descent to 1000ft.

15:26 First Officer Tas announces visual contact with the target courtesy of his high-powered binoculars, 6nm dead ahead. Moments later we pick up a small fishing trawler on our video monitor. There's a quick discussion on the merits of descending to 500ft for a 'phot-run', or photographic flypast, but our monitor picks up a large flock of seagulls in the trawler's wake. At that height the risk of bird-strike is magnified, so we opt for a 1000ft fly-by instead.

15:28 The trawler comes up quickly when the aircraft is travelling at 180 knots. Faces pop out of the wheelhouse and give us a wave as we zoom by, our camera capturing the trawler's registration number on the side of the wheelhouse. Like all contacts, identification details, speed, course and position are all logged in the flight report. We climb back to 2000ft and resume our surveillance track.

15:32 Almost immediately we detect another target 25nm away. Now sitting in the Comms Officer's seat, Maurice requests another 'phot-run'. 15nm from the target our camera picks up the vessel, a bulk carrier heading south.

15:37 We descend again to 500ft. At that height the waves almost seem close enough for me to touch, but the Dash 8 can get down as low as 200ft (60 metres) above the sea for brief periods of time.

16:00 Things get busier as we identify another target to the north, 38nm off the coast. It won't be possible to descend for a close examination as we are now in restricted airspace due to a military exercise and must remain above 3500ft or risk becoming a "target" ourselves.

16:11 We fly into bushfire smoke haze, more than 20nm off the coast.

16:14 Sharp-eyed Maurice spots what could be a small pod of three whales off to the left off the plane. By the time I find a point of reference in the wide ocean, all I can see are indistinct shapes. We make a sharp turn for a closer look but with the sun behind us can no longer see the suspected whales. It is our only whale "sighting" of the flight and is duly noted in the log as we resume course for our target vessel.

16:18 Our target is revealed as a medium-sized tanker, heading north into heavy weather. White caps are clearly visible and the ship's bow is pounding into the seas. I'm again impressed by the capability of Customs Coastwatch technology - even from 3500ft we can clearly identify the name of the vessel on its stern.

16:30 Reaching the end of our last surveillance run we turn west to head for home. The crew complete mission reports and shut down equipment as we climb back to a cruising height more familiar to commercial aircraft.

16:42 We re-cross the coast, and I can remove my lifejacket for the first time on the flight. I'm invited to the cockpit for the last sector of the flight. The bushfires have got noticeably worse since our departure, explaining the smoke haze we encountered offshore.

17:10 Canberra comes into view through the cockpit windscreen. It takes me a while to get my bearings but I can soon spot the airport (of key interest to us) and other major landmarks and suburbs.

17:15 Air traffic control directs a commercial airliner into land ahead of us before First Officer Tas handles a 30 knot cross wind with aplomb to place us down softly just after the runway threshold.

For me it's been an interesting six-hour introduction into the work of Customs Coastwatch. For the crew, just another routine mission. They'll do it all again tomorrow, tracking 20nm off the Australian coast from Nowra in NSW all the way around to Adelaide in South Australia. From there they will visit Hobart.

It's another reminder Customs Coastwatch provides a truly national surveillance service.