Submission No 22

MANAGEMENT OF SHARKS IN NEW SOUTH WALES WATERS

Name: Mr Oliver Mueller

Date Received: 15/09/2015

AERIAL SHARK PATROL

To Whom It May Concern:

My name is Oliver Mueller, I have been a flight instructor for various types of aircraft for the last 14 years and the current owner of Byron Bay Gyrocopters, a Flying School for modern Gyrocopters located at Tyagarah Airfield near Byron Bay.

For many years I have run almost daily flights over and around Byron and Ballina's beaches, where I have observed the marine wildlife, including sharks. Over the last twelve months alone, I have conducted around three hundred flights over Cape Byron and Ballina's beaches. I first started reporting my aerial sightings of larger sharks about 6 years ago to local Surf Life Saving Clubs and offered them my support in reporting shark sightings. Unfortunately, the Surf Life Saving Club did not show much of an interest in this free service.

Over the last two years, I have observed an increase in the number and size of the sharks. In September 2014, I sighted a large Great White Shark near Main Beach. Only one hour later I found out that a man was attacked and killed by a shark off Main Beach; probably by the same shark. This death could have been avoided if a system was in place for aerial shark sightings to be reported to authorities.

Without adequate aerial surveillance of our beaches, shark sightings cannot be communicated directly to lifesavers, swimmers and surfers. From my personal experience the best and most efficient way finding and observing marine wildlife is at an airspeed between 40–55 kt at an altitude of 700-800ft AGL. This gives a great overview and sharks can be still easily spotted with the naked eye. To take good pictures or to identify the species, it is sometimes required to go as low as 300-400ft and slow down to 20-30 kt airspeed. Not many aircraft can legally and aerodynamically perform such flying characteristics.

Below, I have outlined and reviewed a range of observational air surveillance options taking into account their cost-effectiveness, flexibility and other factors.

- **Remote controlled drones:** Drones are great tools for aerial photography and filming (e.g. for real-estate photography) and appear as a cheap option for aerial surveillance, but unfortunately only for a very limited area and time. Drones can only cover a small surveillance area and only offer a very limited scope. Usually they are operated in altitudes below 400 ft (130m) in a 1 km radius to the ground station, which would does not allow for a wide field of vision. Sharks are constantly swimming and changing their location. The water surface area which, should ideally be monitored along Byron's beaches is an area of approx. 32 km^2 and Ballina approx. 60 km^2. Spotting a 4m long, stream-lined shark with a drone would be like finding a needle in a haystack, while the needle is constantly move. Another important consideration regarding drones is that a remote ground operator has to stay in line of sight with the drone and within its 1 km remote-control range; meaning a drone could never patrol a larger area, longer beaches or for example Main Beach and Belongil Beach together or Watagos and Tallows Beach, without forcing the operator changing their position. Furthermore, the drones would be flying

in one of the busiest air corridors of the east coast and shared airspace band (300ft-400ft) with other aircraft. Drones are regarded as a great safety hazard and concern for most pilots, especially for the traffic around Cape Byron and Ballina Byron Gateway Airport because drones are much slower and very hard to see in the air. A collision with a drone in mid air would be disastrous. Another disadvantage would be that the average size drone could only be operated in nil or light wind conditions, which would not be suitable for costal weather conditions. A drone's battery operating time is very restricted too. On average a drones can fly approx. 15 min or less (depending on wind and payload) before they need to be charged again. Drone-surveillance would make only sense if several of them were flying at the same time and several times a day times a day, which would make drones very costly. The cost for approx. 45min air-time (3x15min) of one drone would cost around $120.

- **Fixed wing aircraft:** Planes are much more suitable for shark patrols compared to drones in terms of operating-times and their ability to operate in variable wind speeds. Planes could also cover a much larger area of surveillance. However, most fixed wing planes have a restricted view to the ground, obstructed by their wings or fuselage or small side windows. Furthermore, the minimum speed of a fixed wing aircraft is normally too fast to get good footage or views of sharks. A plane has to constantly to move forward (relatively fast) through the air in order to maintain airflow over the wing and would not allow hovering or circling sharply around an object, making it less suitable for aerial observation of comparably slow moving sharks.

- **Helicopters:** Helicopters are without a doubt the perfect tool for aerial surveillance when it comes to performance, field of vision and coverage due to their wide speed range from hover to 120 kt. However, helicopters are extremely loud, air polluting and at the same time the most costly option for shark observation. A helicopter would cost the taxpayer approx. $600 - $900 for every hour of shark surveillance. Due to this expense, aerial shark surveillance using a helicopter is not a cost-effective or sustainable alternative for ongoing shark patrolling of our beaches. An average size helicopter has a fuel consumption of approx. 60-100 and more litres of AV gas per hour. Having helicopters patrolling our beaches in frequent intervals would not only be extremely costly and noisy, it would cause an enormous environmental pollution issue at the same time.

- **Gyrocopter:** A MTO-Gyrocopter is a open-cockpit, modern gyrocopter that looks like a small helicopter and like a helicopter it is a STOL aircraft (short take-off and landing). Gyrocopters are versatile, noise reduced and comes cheap to operate. A gyrocopter could easily cover a wide area without refueling (4.5 hours) and has an outstanding speed range from as low as 20 kt to top speed of 90 kt. It can be legally operated in a range from 300 ft AGL to 10,000 ft AGL, which gives it the larges altitude range of all lightweight aircrafts, while two rotor blades allow a Gyrocopter to fly comfortably and stable in high wind speeds and turbulences then most other lightweight aircrafts. An MTO-Gyrocopter runs on normal unleaded fuel and has fuel consumption similar to a car of approx. 10–15 litres per hour, depending on the payload. The new MTO models are all equipped with a double-muffler

system, which reduces the engines noise to an unmatched low noise level of its class. Gyrocopters are regarded as one of the safest aircrafts in the world because they cannot stall and are very easy to fly, even in turbulent winds.

For the reasons I have outlined above, I believe that a MTO-Gyrocopter is the best aircraft to perform aerial shark surveillance of our beaches. A Gyrocopter could cover 90% of the areas that a helicopter could for only 10% of the costs. This is the reason why it's widely used in many European countries and the United States by police-patrols, fire fighters and professional aerial photographers. They also are popular in Australia by farmers for cattle mustering and renowned for their cost effectiveness and high performance. This craft has the potential to totally revolutionise emergency management air support in Australia. These outstanding attributes make an MTO-Gyrocopter the perfect choice for aerial shark patrols.

Gyrocopters have already successfully demonstrated their capacity for shark patrolling of Australia's beaches in the past. In 2009 there was a trial-project running for several months where a network of gyrocopter pilots conducted aerial surveillance on a regular base for the Surf Life Saving Clubs, covering an large area from Coffs Harbour to Yamba to Evans Head to Byron Bay. In 2010 another was successfully set up for the Clearance Coast.

Furthermore, the relative ease of flying these craft and the minimal costs in acquiring flying endorsements means that the cost to learn to fly gyrocopters is only around $3,900, while an average person e.g. a Surf Live Safer with no previous flight experience can be flying solo with on average with 25 hours training.

Gyrocopters are cost effective to purchase, operate and maintain. Most importantly, gyrocopters are safe and relatively easy and quick to learn to fly. Gyrocopters are affordable, efficient and I believe, the best aircraft to undertake ongoing shark patrols of our beaches.

I would be happy to discuss this idea or any of the points raised in my letter with you further.

Warm Regards,

Oliver Mueller,

(Mullumbimby, 08.Sept.2015)

52 New City Road, Mullumbimby 2482, NSW, Phone: [redacted], Email: [redacted], Website: www.flygyro.com.au


eastcoastautogyro.com.au
SHARK PATROL

Supporting Media Links to Shark Patrol Submission:

http://www.coffscoastadvocate.com.au/story/2009/10/06/shark-watch-gyro-takes-to-the-skies

http://www.sunshinecoastdaily.com.au/story/2009/09/17/eye-sky-shark-watch/

http://www.dailyexaminer.com.au/story/2009/10/02/shark-watch/

http://www.bellingencourier.com.au/news/local/sport/general/shark-watch-along-our-beaches/1642068.aspx

http://www.tweednews.com.au/story/2009/10/06/shark-watch-gyro-takes-to-the-skies/

http://www.dailyexaminer.com.au/story/2009/10/13/shark-watch-on-patrol-over-beaches/

http://www.northernstar.com.au/story/2009/10/06/shark-watch-gyro-takes-to-the-skies/