Drones in Mosquito Control in North Carolina

By:

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Overview

- What is a drone?
  - Features to look for
- Rules and regulations for drone/drone usage
- How to utilize your drone activity
- The future in mosquito control

What is a Drone? (UAS-Unmanned Aircraft System)

- Commonly referred to as drones, North Carolina law defines a UAS as "unmanned aircraft and associated elements, including communication links and components that control the unmanned aircraft that are required for the pilot in command to operate safely and efficiently in the national airspace system"

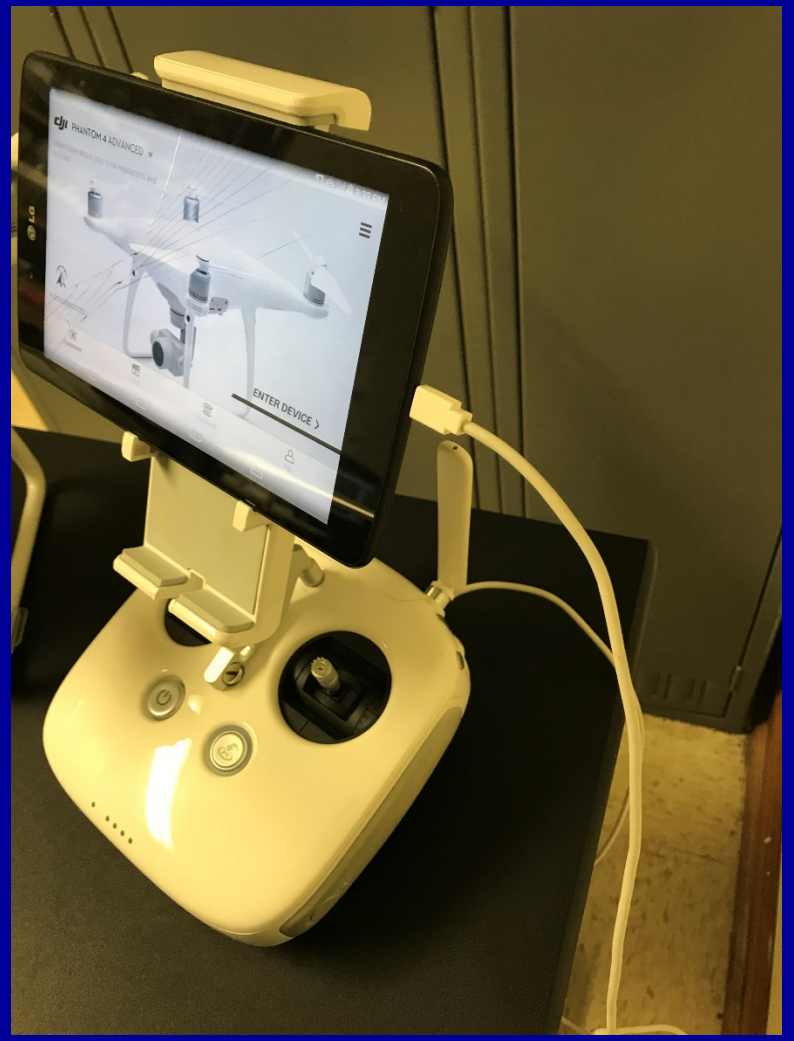
Features To Look for …

- **GPS navigation-** GPS navigation makes it possible to track your drone or program routes.
- **Streaming video-** Drones with this capability let you stream video from a first person video view or simply stream video back to a computer, phone, or tablet.
- **Power-** Payload size, battery life, and propeller speeds all impact flight time, flight radius, and so on. More propellers mean more power and can pick up the slack if one propeller fails.

Spare Parts

- Invest in spare parts for maintenance
  - Batteries
  - Propellers
  - Chargers
  - Memory cards

Drone controller is hardwired to phone or tablet



Rules and Regulations

- **The FAA and the Federal government have exclusive authority over airspace in the United States.**
- **The State of North Carolina** is responsible for ensuring that anyone operating UAS/drones in the state understand North Carolina-specific regulations

Session Law 2017-179

- prohibits drone use near prisons, jails and any other correction or confinement facility. Near is defined as a horizontal distance of 500 feet or a vertical distance of 250 feet. Signs will be placed around facilities to remind drone users of the boundaries. Penalties range from a fine of $500 to $1500, and include confiscation of the aircraft.

Frequently Asked Questions

- What is the Small UAS Rule?
  - The Small UAS Rule requires those who have unmanned aircraft systems, or UAS, that weigh less than 55 pounds, payload included, to register their aircraft with the FAA
- Is the FAA's Small UAS Rule still in effect?
  - Yes, it has been in effect from August 29th of 2016 and is still in effect at this time of writing.
- Do I have to carry my Certificate of Aircraft Registration while flying my UAS at all times?
  - Yes, you must have the registration certificate from the FAA at all times during flight operation. In accordance with federal law, all UAS operators must show their certificate of registration to any local, state, or federal law enforcement officer when they are asked to do so.

Part 107 Operational Parameters

- The FAR Part 107 rule formalizes operations for small unmanned aircraft in the National Airspace System. Both commercial and government operators may function under the authority and within the requirements of Part 107. The operational parameters are similar to those of the 333 Exemption and Blanket COAs. Currently, the FAA is also allowing for waivers of some of the limitations if a proponent can provide a safety case to mitigate the additional risk. The basic highlights of 14 CFR Part 107 are listed below:
  - Part 107 Operational Limitations:
  - ▪ Aircraft less than 55 pounds
  - ▪ Visual Line of Sight only
  - ▪ Daylight hours only
  - ▪ Max airspeed: 100 mph
  - ▪ Max altitude: 400 feet Above Ground Level (AGL)
  - ▪ Requires preflight inspection
  - ▪ No careless and reckless operations
  - ▪ One aircraft per one operator
  - ▪ Pilots must avoid aircraft operations over people
  - ▪ Can fly in Class B, C, D, and E airspaces with Air Traffic Control (ATC) permission
  - ▪ Can fly in Class G airspace without ATC permission
  - ▪ No transportation of hazardous materials

Part 107 Operator Requirements

- :
  - Pass an aeronautical knowledge test for small UAS Type Certificate under Remote Pilot Certificate
  - Vetted by TSA
  - 16 years of age
- Part 107 Aircraft Requirements:
- ▪ No airworthiness certification
- ▪ Aircraft registration number must be obtained and displayed on the aircraft
- ▪ Small (less than 55 pounds) tethered-powered UAS are also included in the Part 107 definition as needing registration and compliance with operational limitations

The Future

- We are currently in communication with the North Carolina Department of Agriculture to identify the processes that need to be in place to develop this new technology
- We are looking at fiscal year 2019-2020 to purchase and implement aerial drone larviciding
- Projected cost is approximately $25,000.00
- It is critical that the drone developmental protocols be in place before a capital budget purchase is requested through the county

Current North Carolina Aerial Applicator Regulations

- A contractor must have an operating certificate issued by the FAA
- **License Requirements--**Core Exam, Public Health, Aerial Application
- In North Carolina, UAV's are currently regulated exactly like airplanes
- All pilots must have a commercial-type license issued by the FAA.
- Pilots must have completed at least 125 hours and have one year's flying experience in aerial pesticide application. A pilot with less than 125 hours and one year's experience will be licensed as an apprentice and must operate under the direct supervision of a licensed pilot.
- Must pay an annual $75 license fee and participate in continuing education
- Annual inspections of aircraft by NCDA&CS fee $25.

A Few Relevant NCDA Considerations

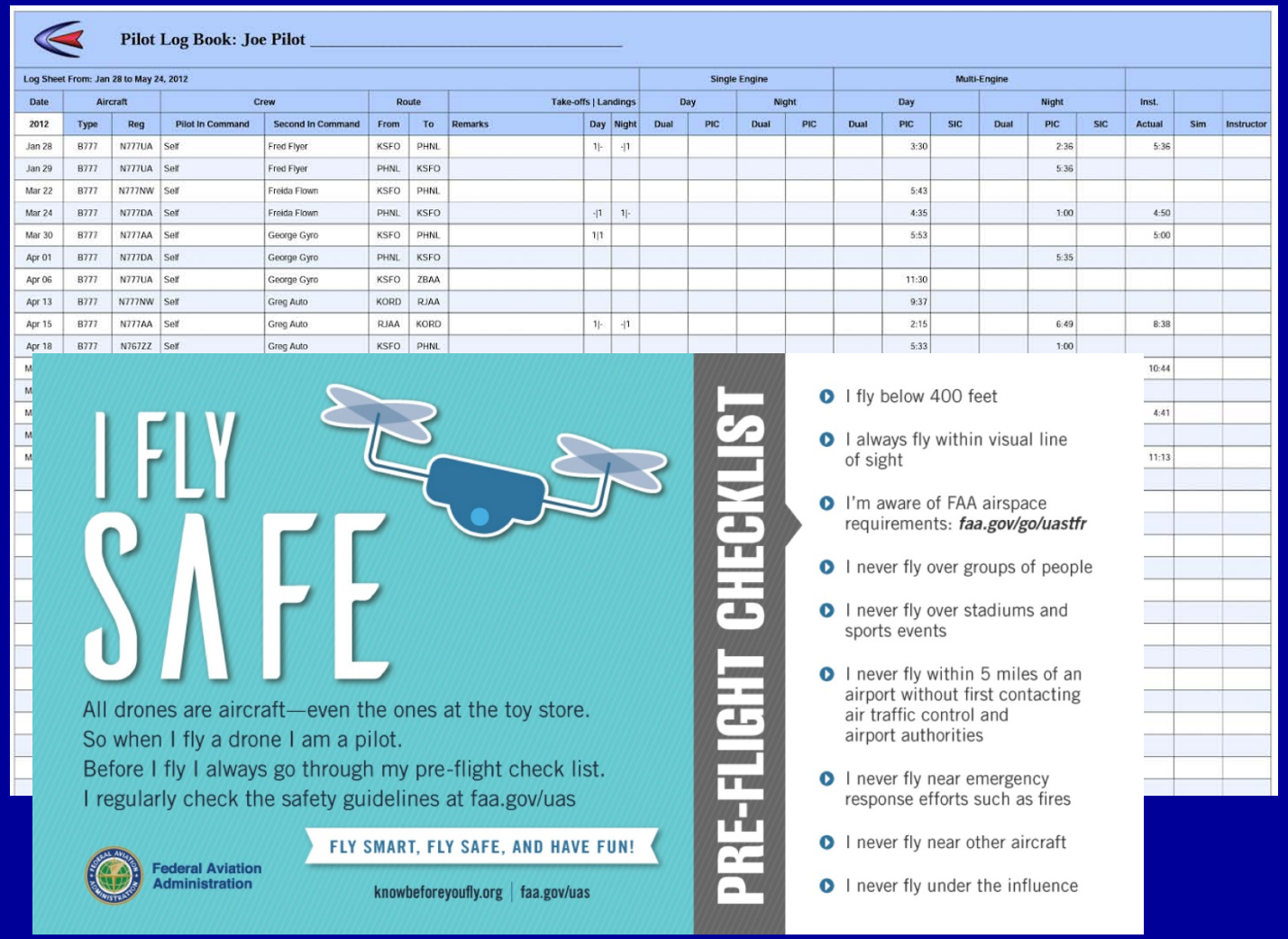
02 NCAC 09L.1000 - AERIAL APPLICATION OF PESTICIDES

- **02 NCAC 09L .1002 GENERAL REQUIREMENTS**
  - **Basic pesticide handling rules**
- **02 NCAC 09L .1003 DRIFT CONTROL**
  - No person shall apply a pesticide(s) aerially under such conditions that drift from pesticide(s) particles or vapors results in adverse effect.
- **02 NCAC 09L .1005 RESTRICTED AREAS**
  - No pesticide shall be deposited by aircraft within 300 feet of the premises of schools, hospitals, nursing homes, churches, or any building
  - No pesticide shall be deposited by aircraft on the right-of-way of a public road or within 25 feet of the road
  - No pesticide shall be deposited within 100 feet of any residence.
- **02 NCAC 09L .1006 EXEMPTIONS**
  - Any local health director or aerial applicator licensed under the subcategory of public health pest control, under supervision of such local health director when conducting a control operation for disease vectors or other pest of public health significance shall be exempted from 2 NCAC 9L .1002(i), General Requirements; .1003, Drift Control; and .1005(b) through (e), Restricted Areas, provided such local health director or his authorized designee notifies the secretary of the Board prior to initiation of subject operation and submits the following information:
  - **Where do day to day larviciding operations fit?**
- **02 NCAC 09L .1009 NOTIFICATION OF APIARIES**

Authority G.S. 143-458; 143-463; Eff. July 2, 1976; Amended Eff. January 1, 1985.

Flight Logs and Checklists

- Maintain flight times and any maintenance with flight logs and pre and post flight checklists



Pilot Log Book: Joe Pilot _____

Log Sheet From: Jan 28 to May 24, 2012

Date	Aircraft		Crew		Route		Take-offs | Landings			Single Engine				Multi-Engine								
										Day		Night		Day			Night			Inst.		
2012	Type	Reg	Pilot In Command	Second In Command	From	To	Remarks	Day	Night	Dual	PIC	Dual	PIC	Dual	PIC	SIC	Dual	PIC	SIC	Actual	Sim	Instructor
Jan 28	B777	N777UA	Self	Fred Flyer	KSFO	PHNL		1|-	-|1						3:30			2:36		5:36		
Jan 29	B777	N777UA	Self	Fred Flyer	PHNL	KSFO												5:36				
Mar 22	B777	N777NW	Self	Freida Flown	KSFO	PHNL									5:43							
Mar 24	B777	N777DA	Self	Freida Flown	PHNL	KSFO		-|1	1|-						4:35			1:00		4:50		
Mar 30	B777	N777AA	Self	George Gyro	KSFO	PHNL		1|1							5:53					5:00		
Apr 01	B777	N777DA	Self	George Gyro	PHNL	KSFO												5:35				
Apr 06	B777	N777UA	Self	George Gyro	KSFO	ZBAA									11:30							
Apr 13	B777	N777NW	Self	Greg Auto	KORD	RJAA									9:37							
Apr 15	B777	N777AA	Self	Greg Auto	RJAA	KORD		1|-	-|1						2:15			6:49		8:38		
Apr 18	B777	N767ZZ	Self	Greg Auto	KSFO	PHNL									5:33			1:00				
																				10:44		
																				4:41		
																				11:13		

I FLY SAFE

All drones are aircraft—even the ones at the toy store.
So when I fly a drone I am a pilot.
Before I fly I always go through my pre-flight check list.
I regularly check the safety guidelines at faa.gov/uas

Federal Aviation Administration

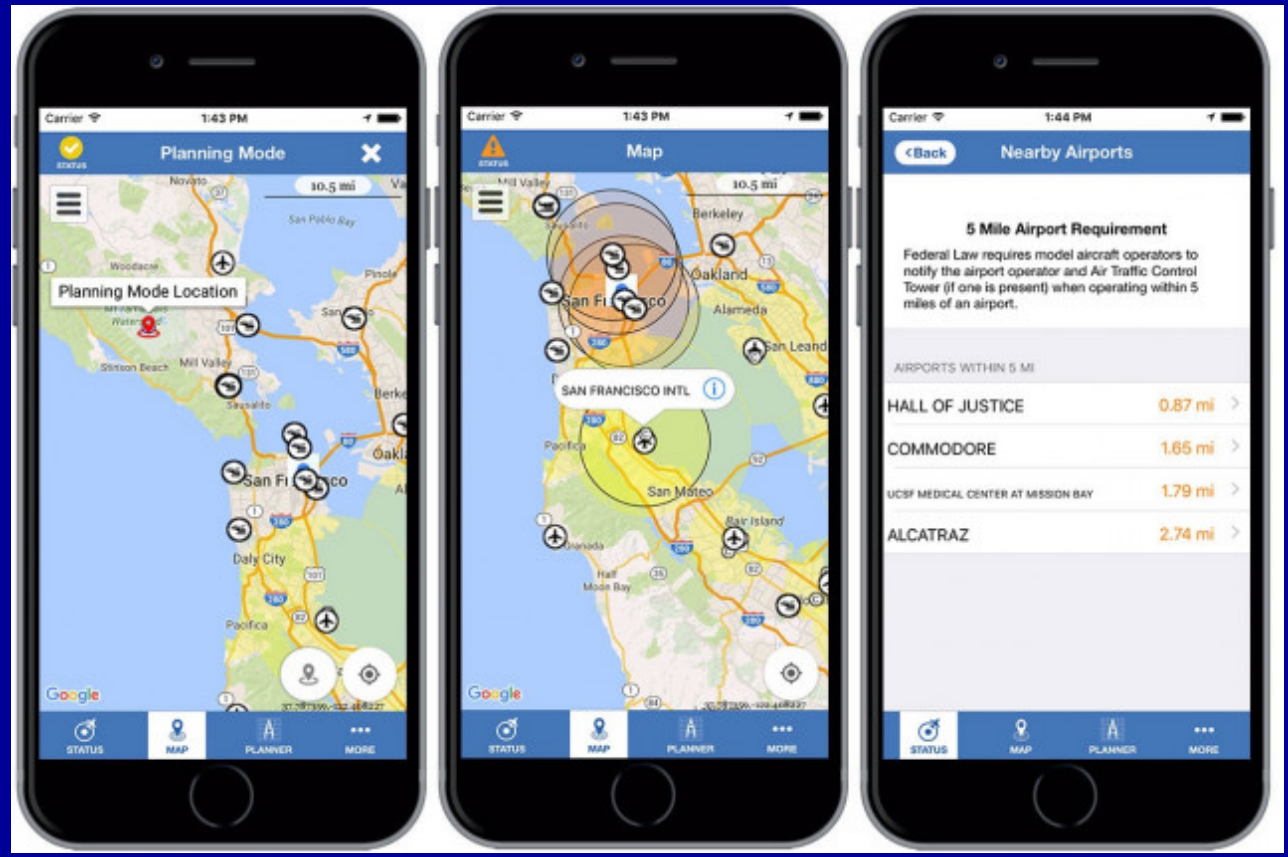
FLY SMART, FLY SAFE, AND HAVE FUN!

knowbeforeyoufly.org | faa.gov/uas

PRE-FLIGHT CHECKLIST

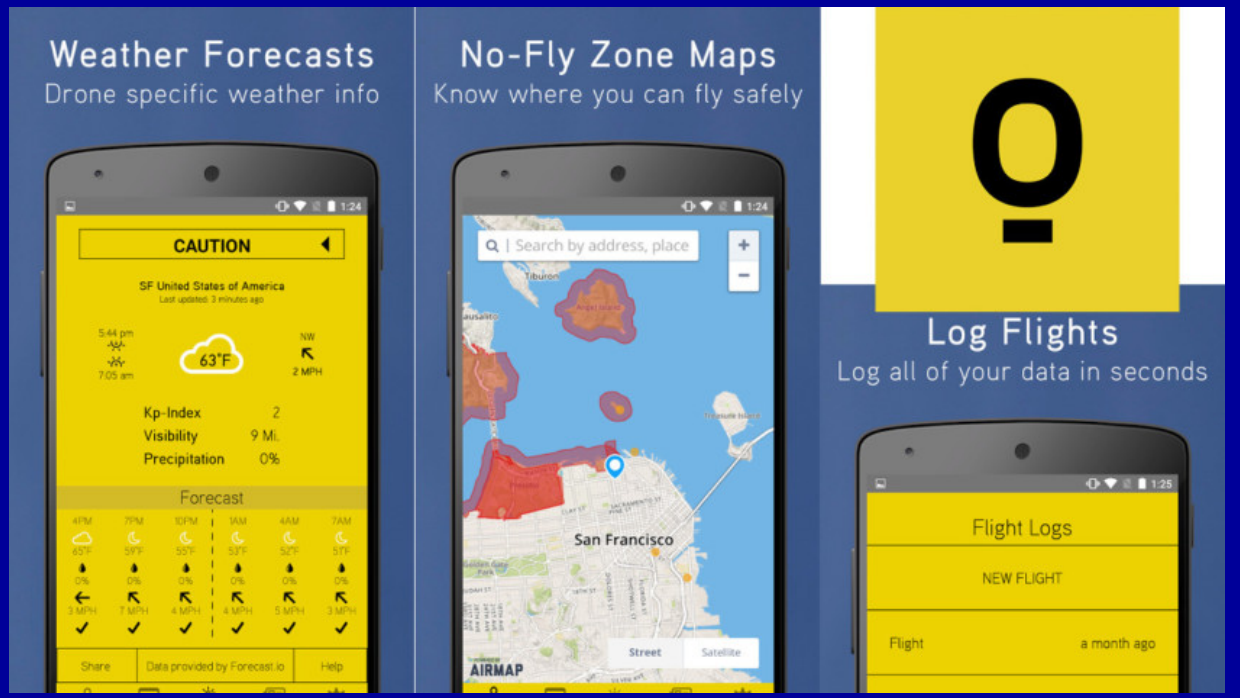
- I fly below 400 feet
- I always fly within visual line of sight
- I'm aware of FAA airspace requirements: ***faa.gov/go/uastfr***
- I never fly over groups of people
- I never fly over stadiums and sports events
- I never fly within 5 miles of an airport without first contacting air traffic control and airport authorities
- I never fly near emergency response efforts such as fires
- I never fly near other aircraft
- I never fly under the influence

Apps that are useful-B4UFly



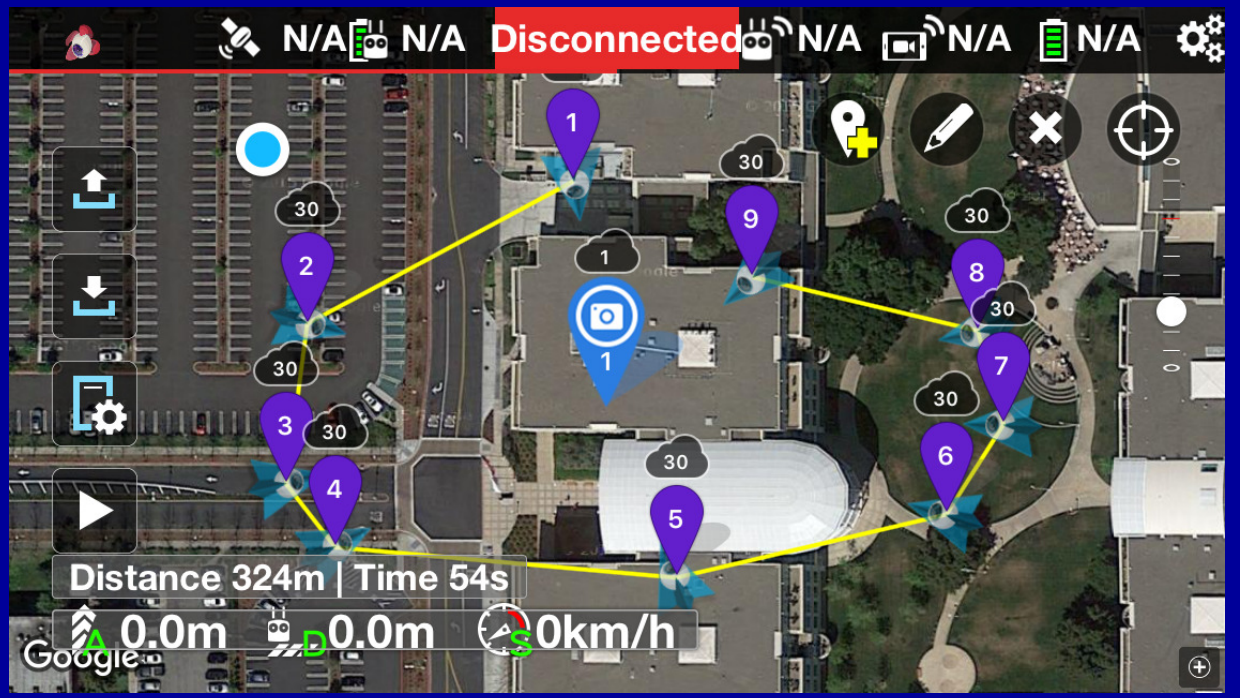
B4UFly is an app that helps you identify areas where you can fly and where it might be a restricted airspace. It notifies you of nearby airports, and allows you to get in touch with flight control.

Apps that are useful-hover



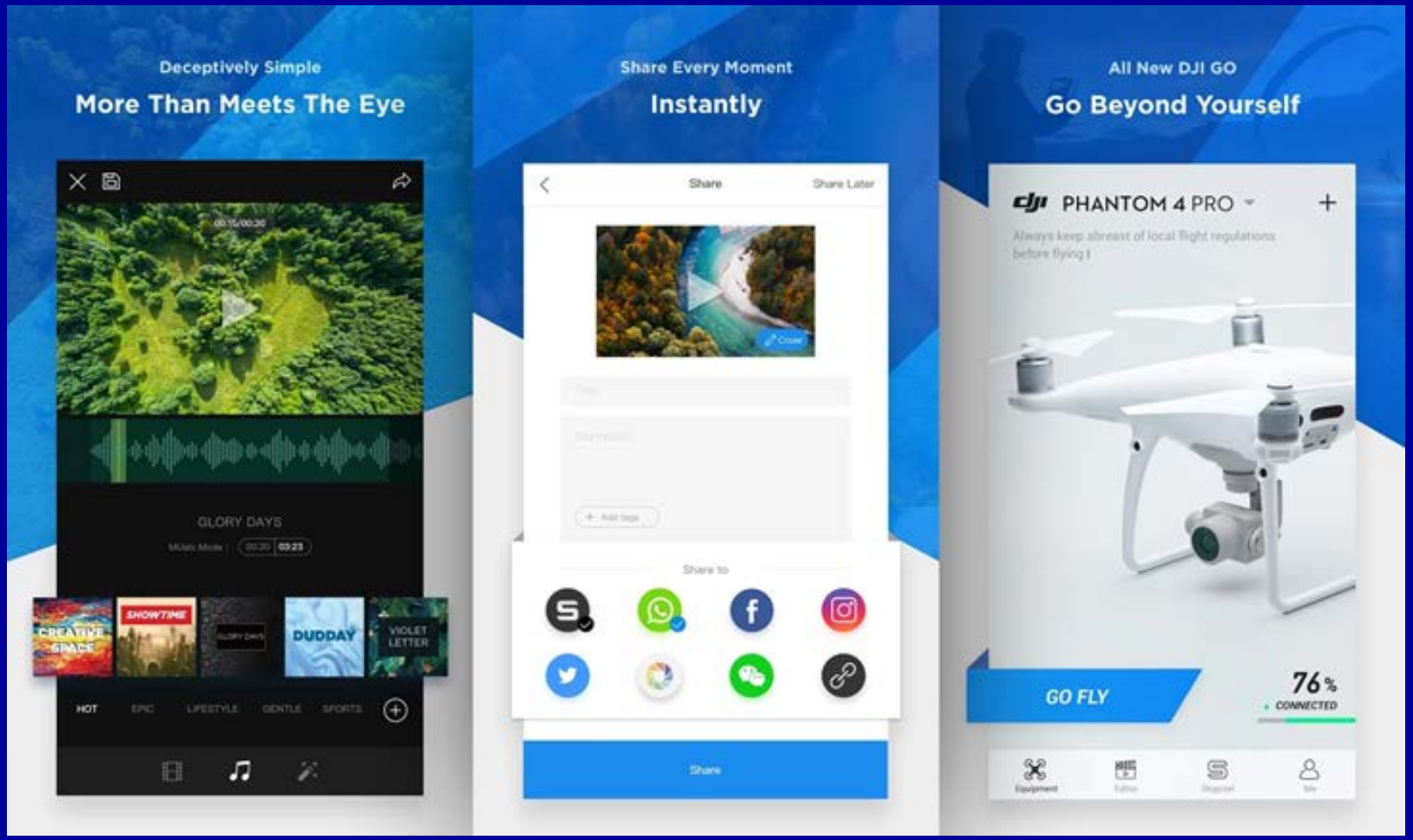
Hover allows you access to weather forecasts of the area you are flying, notifies you of no fly zones and allows you to log flights seamlessly in one app.

Apps that are useful-litchi



Litchi allows you to not only track your drone via GPS but also allows you to preprogram flight routes and control what the drone does at its checkpoints.

Apps that are Useful-DJI GO 4



Benefits of using drone for aerial surveillance and larviciding

- Access hard to reach areas for surveillance with the drone.
  - Survey an area and the landscape prior to setting foot in the area
- Surveillance can now be a fraction of the time it normally was
- Gain a better view on a location or locations
- Can be used for GIS Mapping and 3D Mapping

Using a drone can cut down on surveillance time, and makes it easier to see an area prior to actually stepping foot in the desired location.

Aerial view of dredge spoil island. You can see where there are pockets of water and the terrain.

- The drone can help you determine what the terrain looks like. From that information gathered you can determine the possible mosquitoes in that habitat.
- Example: Fly over a salt marsh, possible species encountered in that area could be sollicitans or taeniorhynchus.

DJI Agras MG-1

- DJI Agras MG-1

DJI Agras MG-1

- 40-60 times faster than manual spraying
- Can cover 7-10 Acres per hour
- 10 kg payload (approx. 22 lbs.)
- Weighs approximately 20 lbs.
- Water resistant
- Flight Time is approximately 24-27 minutes.
- Current price is approximately $15,000

Review

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- The future


Thank You