



UNMANNED AIRCRAFT SYSTEM PROGRAM FROM CERTIFICATION TO APPLICATION

Using drones to revolutionize mosquito control efforts starts in Placer County

OVERVIEW

Placer Mosquito’s mission is to effectively and efficiently manage the risks from vectors and vector-borne diseases in order to protect public health and improve quality of life in Placer County. Part of accomplishing this mission is to pursue, develop and evaluate technologies that can support our operations.

Since 2016, the District committed to exploring unmanned aircraft systems (also known as drones) to enhance the District’s ability to perform its mission. Using drones allows the District new opportunities to control mosquito populations and update traditional techniques. We continue to evaluate our drone program and its capabilities and incorporate new tools into our operations as mosquito issues in our county grow with new threats like invasive mosquitoes and a longer mosquito season due to climate change.

OUR DRONE PROGRAM TIMELINE

Placer Mosquito is at the forefront of incorporating drones into mosquito control. Below is a timeline of steps we took to incorporate drones into everyday operations.

2012	<ul style="list-style-type: none"> • Congress passed the FAA Modernization and Reform Act which directed FAA to integrate unmanned aircraft into the national airspace.
2016	<ul style="list-style-type: none"> • FAA released the Small UAS Rule, “Part 107”, which provided specific operating rules and pilot certification for the commercial use of small UAS under 55 lbs. • District employees Scott Schon and Ev Ortiz were selected to attend drone pilot training and received their Part 107 Unmanned Pilot Certification. • District purchased its first drone – DJI Phantom 3 Standard.
2017	<ul style="list-style-type: none"> • In January, the Placer Mosquito Board approved a resolution to support the development of UAS technology for the purposes of protecting public health. • District created the Mosquito Assessment and Control UAS (MAC-UAS) pilot project to evaluate UAS missions. • First detection of mosquito larvae by drone. • In August, the District received UAS safety training, operational manuals, and safety certification from Harrison Wolf, Wolf UAS. • In October, California AB 527(Caballero) was passed and allows non-agricultural pilots like mosquito and vector control personnel who held state certification as a vector control technician to qualify to take the state aerial applicator’s certification test (PCAP) and make drone applications.
2018	<ul style="list-style-type: none"> • District received Agricultural Aircraft Operations Certificate - Part 137 from the FAA. • District Manager presented results of MAC-UAS pilot project to the Mosquito and Vector Control Association of California. • District received first spray drone – DJI AGRAS MG-1s.
2019	<ul style="list-style-type: none"> • CA Department of Pesticide Regulation released a test for VCT unmanned aircraft certificate. • Conducted numerous test flights and calibration testing for the DJI AGRAS MG-1s. • District employees Scott Schon and Ev Ortiz received their California aerial application certification. • Began operational mosquito larvicide applications by drone.
2021	<ul style="list-style-type: none"> • Performed first drone application of mosquito larvicide for snowmelt mosquitoes near Lake Tahoe.
2022	<ul style="list-style-type: none"> • Began technical support missions where the drone team is assigned to assist with treatments or habitat assessments at the request of other vector control technicians in the field.
2023	<ul style="list-style-type: none"> • Received two new spray drones – Hylio AG-210 and Hylio AG-230.
2024	<ul style="list-style-type: none"> • Held first Drone Demonstration Day in Placer County. • American Mosquito Control Association Drone Program begins to help standardize and support drone program regulatory compliance, safety, and operations for mosquito control agencies nationwide.

BENEFITS

Drones offer many benefits to our operations like a zero footprint on marsh and sensitive lands, smaller and more precise aerial treatments, improved irrigation monitoring and applications to areas that are hard to access. Drones reduce employee safety risks, noise and fuel emissions and cost of equipment and labor. Instead of a manned aircraft that requires a pilot, drones are operated by a pilot-in-command on the ground who uses a remote transmitter, which reduces potential safety risks.

SOURCE TYPES

We use drones to treat a variety of different sources both small and large. Some of the smaller sources would include harder to access wetlands and some of the largest sources are organic rice in West Placer.

- Rice fields and other irrigated crops and pastures
- Irrigation ditches and basins related to agriculture.
- Wetlands and other naturally flooded areas
- Low areas/flooded timber
- Retention basins
- Snow melt pools

EQUIPMENT

Placer Mosquito has four active drones in its fleet, three drones are under 55 lbs. and one drone is over 55 lbs. We have four licensed Federal Aviation Administration Part 107 remote pilots and two pilots with additional Department of Pesticide Regulation licenses for aerial applications.

Hyllo AG-210

Used mainly for larvicide applications, capable of using both liquid and granular formulations. Has the ability to make adulticide applications too.

- 2.5 gallon tank for liquid formulations
- 10 L Spreader for granular formulations
- 8 nozzles
- 4 motors
- Max Recommended takeoff weight 54.9 pounds
- Max operating speed 25 mph

Hyllo AG-230

Used mainly for larvicide applications, capable of using both liquid and granular formulations. Has the ability to make adulticide applications too.

- 2 x 4-gallon tanks for liquid formulations
- 20 L spreader for granular formulations
- 16 nozzles
- 8 motors
- Max recommended takeoff weight 165 pounds
- Max operating speed 25 mph

DJI Matrice M210

This UAS is used to attach smaller sensors, including different cameras. Primarily used for habitat assessment missions.

DJI Mavic 2 Enterprise

This smaller UAS is used for habitat assessment missions.

NEXT STEPS & FUTURE BENEFITS

What's next for drones in Placer County mosquito control?

In collaboration with the **American Mosquito Control Association Drone Program**, the District continues to innovate the use of drones in mosquito control.

Ensuring pesticide applications are safe and comply with EPA regulations.

Evaluating more advanced missions to control mosquito larvae before they emerge into biting adults like applications over trees and vegetation.

Enhancing ability to control adult mosquitoes in areas difficult to access by truck or manned aircraft.

Improving worker safety, operational efficiency, and training workforce to operate and work with drone technology.