

Impact of UAS-Based Mosquito Control on Population Reduction in the Origins Area (2022–2025)

1. Executive Summary

This report evaluates the effectiveness of using Unmanned Aircraft Systems (UAS) for mosquito control operations in the Origins area. Using mosquito trap data from 2022 through 2025, the analysis demonstrates a substantial and sustained decrease in mosquito populations following the introduction of UAS-based treatments in 2023.

2. Background

The Origins site is an isolated environment known for persistent mosquito breeding due to its wetland features and limited ground access. Prior to 2023, mosquito control operations relied solely on ground-based applications, which limited treatment reach and efficiency. In early 2023, UAS technology was introduced to apply larvicide more precisely across difficult-to-reach habitats.

3. Data and Methodology

Trap data was collected from 2022 to 2025 and aggregated by month. 2022 served as the baseline year (no UAS), while 2023–2025 represent UAS-based control years. Monthly totals were analyzed to assess year-to-year changes and overall trends.

Year	Total Count	% Change vs 2022
2022	6,329	0.0%
2023	3,025	-52.2%
2024	4,781	-24.5%
2025	578	-90.9%

Table 1: Annual Totals and Percent Change vs 2022

4. Results

The 2022–2025 mosquito count trends show clear reductions after UAS implementation. The first year (2023) of UAS use saw a dramatic drop in total mosquito captures. By 2025, counts were reduced to less than 10% of 2022 levels, confirming long-term suppression of mosquito populations.

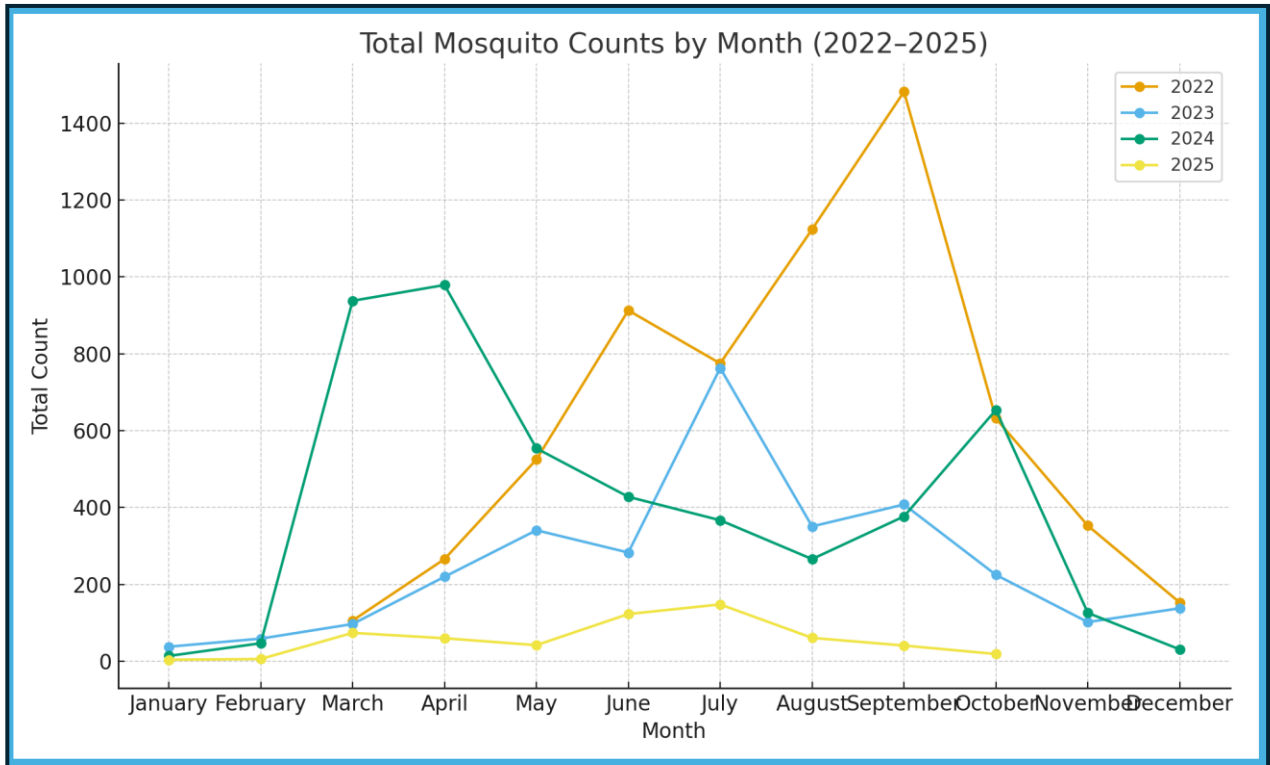


Figure 1: Total Mosquito Counts by Month (2022–2025)

5. Discussion

The evidence supports the hypothesis that UAS implementation directly contributed to population reduction. Precision aerial treatment ensured coverage of isolated breeding habitats inaccessible to ground crews. The decline persisted through multiple years, suggesting improved long-term control rather than short-term fluctuation.

6. Conclusion

The introduction of UAS technology in 2023 resulted in a sustained and measurable reduction in mosquito populations at the Origins site. From 2022 to 2025, total mosquito counts dropped by nearly 91%, demonstrating the effectiveness of aerial precision treatment in managing isolated breeding zones.

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