



Handsome Bay *Wolbachia* Mosquito Release Report December 2022

Dear Handsome Bay Residents,

Thank you for contributing to the success of the Mark-Release-Recapture Studies!

Wolbachia Recap: Over the past few months, Green VI's BugOut Team has worked to evaluate the potential of a new, non-toxic, non-genetically modified mosquito control tool called *Wolbachia*. *Wolbachia* is a naturally occurring bacteria found in many local insects. Since *Wolbachia* causes the disease-carrying male *Aedes Aegypti* mosquito to become incompatible with wild female mosquitoes, non-biting *Wolbachia* males can be released to mate with wild females without producing offspring. Only female mosquitoes bite. Male mosquitoes do not bite. By releasing only *Wolbachia* male mosquitoes to mate with female mosquitoes on VG, the number of mosquitoes can be reduced.

MRRs a Success: With the help of Handsome Bay residents, we've conducted two successful Mark-Release-Recapture studies (MRRs) to evaluate whether males containing *Wolbachia* can survive and disperse in the community, which is important for the *Wolbachia* method to work. *Wolbachia* males that survive well and disperse find females with which to mate, prevent the females from laying viable eggs and reduce the next generation of mosquitoes. We were able to evaluate this method with the help of everyone in Handsome Bay who hosted the mosquito traps from which the data on where the mosquitoes went and how many were recaptured after release was gathered. This cooperation was critical to the success of the studies, and we sincerely thank you!

How Long/How Far? The Mark-Release-Recapture studies showed that *Wolbachia* mosquitoes released in Handsome Bay can survive long enough to be used in the *Wolbachia method* when released 3 times per week. The study also found that

Wolbachia male mosquitoes fly an average of 139 metres (456 feet) in their lifetime! This is comparable to wild mosquitoes without *Wolbachia*. Again, thank you for hosting traps in Handsome Bay.

Proposed Releases: For several years, Green VI's BugOut Team and the VG community have successfully reduced VG mosquito breeding sites by over 50%. To further reduce mosquitoes, we propose, with your support, to start the first *Wolbachia* male releases in January 2023. We expect that this will help to reduce the risk of dengue and other mosquito-borne diseases in the community and prevent nuisance mosquito bites. We propose to start releases in Handsome Bay beginning January 2023.

We would very much appreciate your cooperation on this next step in the *Wolbachia* method (approved by the Ministry of Health) and invite your feedback and questions. Please attend the:

Community Meetings

December 11th 4:00pm December 13th 6:00pm January 4th 6:00pm

Old Yard Inn Conference Centre

or contact **Dr Amy Lynd**, our mosquito scientist, at 340-1969 or amy@greenvi.org.

Release Method: To effectively use *Wolbachia* male mosquitoes in Handsome Bay, the data from our MRR studies suggest we need to release non-biting *Wolbachia* males 3 times per week. Our partner, Verily in California, will provide the mosquitoes and the Green VI team will then release them for now from small, hand-held containers three days per week. These special mosquitoes are derived from locally-caught wild mosquitoes and scientifically bred to contain the *Wolbachia* bacteria.

What to Expect: Male *Wolbachia* mosquitoes, which do not bite, may swarm where people are gathered as they search for females with which to mate. Only female mosquitoes bite and, by releasing incompatible male *Wolbachia* mosquitoes, we expect that the number of biting female mosquitoes will go down over time. You will likely notice additional male mosquitoes near or around your house during releases. This is a good sign that the *Wolbachia* males are out there doing their job!

How to Help: Mosquitoes breed in very small, medium and large pockets of water found close to humans, as the females depend on us for blood to reproduce. In addition to your continuing cooperation in the project, there are simple ways we, as individuals, can maximise the impact of *Wolbachia* males and reduce wild mosquitoes:

- Clean up litter that can hold water
- Tip out standing water from containers or plants
- Treat septic systems with larvicide
- Host a BG-Sentinel trap at home

The BG-Sentinel Traps, which you may have seen in the neighbourhood, catch both female and male mosquitoes and provide the BugOut Team with data on the number of mosquitoes in your area to make sure control tools are working effectively.

The BugOut Team can help with larvicides, BG-Sentinel traps, site evaluations and recommendations and will be making more frequent parcel inspections in the weeks before the releases start. Contact Vernessa Bellot at 340-1853 for help from the Bug Out Team or to arrange a visit to the EcoPark.

Please Note: Virgin Gorda communities are at risk from dengue, Zika and chikungunya viruses transmitted by the *Aedes aegypti* mosquito. Although the Green VI BugOut team and the VG community have successfully reduced mosquito numbers on the island by removing and treating breeding sites, the non-native *Aedes* mosquito is still present; meaning future disease outbreaks are inevitable.

The *Wolbachia method* is well-suited for use in our environment because it is a bacteria that naturally occurs in many insect species - including local *Culex* mosquitoes, bees and butterflies - but does not occur in the disease-carrying *Aedes aegypti* mosquito. When non-biting male *Aedes* mosquitoes treated with *Wolbachia* mate with wild *Aedes* females that don't have *Wolbachia*, the eggs fail to hatch, resulting in a reduction in mosquito numbers and, potentially, elimination. This vector control method has been used successfully in many places, such as California, Australia, Singapore and Puerto Rico.