Supplementary Material

DATA AND SENSITIVITY ANALYSIS TABLE

Data generated by the Model

Day	Growth Rate	Carrying Capacity	Infection Prevalence Ratio	Uninfected Ratio	Mosquito Population	Release	Infected Mosquito	Uninfected Mosquito	Seasonal Growth Rate	Seasonal Carrying Capacity	Seasonal Infection Prevalence Ratio	Seasonal Uninfected Ratio	Seasonal Mosquito Population	Seasonal Release
0	0.030000	1030	0.204024	0.795976	1000	0	204	795	0.030000	1030	0.486871	0.513129	1000	0
1	0.031119	1033	0.265469	0.734531	1001	175	265	735	0.031458	1027	0.530878	0.469122	994	175
2	0.031746	1031	0.298008	0.701992	999	175	297	701	0.032424	1082	0.557847	0.442153	1047	185
3	0.032292	1028	0.325290	0.674710	995	174	323	671	0.033321	1081	0.581470	0.418530	1044	185
4	0.032157	1026	0.318608	0.681392	993	174	316	677	0.033522	1083	0.586606	0.413394	1046	185
360	0.033783	1068	0.395349	0.604651	1032	181	408	624	0.032393	1640	0.556992	0.443008	1586	280
361	0.033500	1066	0.382525	0.617475	1031	180	394	636	0.032446	1631	0.558443	0.441557	1578	279
362	0.033367	1104	0.376414	0.623586	1067	187	401	665	0.032664	1654	0.564280	0.435720	1600	283
363	0.033606	1104	0.387335	0.612665	1066	187	413	653	0.033241	1649	0.579431	0.420569	1594	282
364	0.034799	1098	0.439635	0.560365	1060	186	466	594	0.034786	1648	0.617482	0.382518	1591	281

Figure S1. Representative Sample from the Stochastic Control Release Strategy Model.

This table displays a selected sample of data, including the first and last five entries, generated from our stochastic control release strategy model. Key variables featured are Day, Growth Rate, Carrying Capacity, Infection Prevalence Ratio, Uninfected Ratio, Mosquito Population, Release, and their seasonal equivalents up to Release Seasonal. This sample offers an initial overview of how these variables, shaped by our model, vary daily and seasonally. For a comprehensive examination of the model's outputs, the complete dataset, encompassing a wide array of variables and detailed model-derived data, is available upon request.

Sensitivity Analysis Results

Table S4. Sensitivity Analysis Results with 95% Confidence Intervals

Parameter	Adjustment	Mean β	Std β	CI Lower	CI Upper
T_{cir}	100%	0.020207	0.006709	0.026833	0.027126
T_{cir}	150.0%	0.010981	0.007792	0.034526	0.034748
T_{cir}	50.0%	0.033342	0.003308	0.033939	0.034229
dt_{cir}	100%	0.020079	0.006712	0.013127	0.013435
dt_{cir}	150.0%	0.051465	0.011104	0.029679	0.029939
dt_{cir}	50.0%	0.040267	0.007802	0.016615	0.016837
$\zeta_{\sigma_{\text{cir}}}$	100%	0.025482	0.003735	0.025799	0.026061
$\zeta_{\sigma_{\text{cir}}}$	150.0%	0.017653	0.004511	0.024634	0.024798
$\zeta_{\sigma_{\text{cir}}}$	50.0%	0.022584	0.003113	0.023735	0.023949
κ_{cir}	100%	0.025864	0.005684	0.031405	0.031589
κ_{cir}	150.0%	0.036240	0.008554	0.019185	0.019466
κ_{cir}	50.0%	0.034306	0.006050	0.029458	0.029742
ζ_{cir}	100%	0.032298	0.006000	0.022596	0.022849
ζ_{cir}	150.0%	0.016578	0.006721	0.020434	0.020708
ζ_{cir}	50.0%	0.031216	0.004184	0.038862	0.039261
$\beta_{0,\text{cir}}$	100%	0.017100	0.006304	0.039047	0.039309
$\beta_{0,\text{cir}}$	150.0%	0.042281	0.004468	0.034551	0.035027
$\beta_{0,\text{cir}}$	50.0%	0.016981	0.004026	0.015772	0.015870
σ_{cir}	100%	0.030680	0.002768	0.039722	0.040054
σ_{cir}	150.0%	0.028990	0.006712	0.023630	0.023945
σ_{cir}	50.0%	0.035309	0.003003	0.030341	0.030612
θ_{cir}	100%	0.040081	0.007099	0.029714	0.029906
θ_{cir}	150.0%	0.039589	0.003673	0.017705	0.017922
θ_{cir}	50.0%	0.033041	0.006050	0.029645	0.030115

Table S5. Sensitivity Analysis Results on Mosquito Population Dynamics

Parameter	Adjustment Factor	Final Population Size
λ_1	0.5	666.73
λ_1	1.0	596.05
λ_1	1.5	812.21
λ_2	0.5	729.38
λ_2	1.0	1107.11
λ_2	1.5	665.65
σ_1	0.5	845.34
σ_1	1.0	789.23
σ_1	1.5	1847.88
ζ_1	0.5	705.85
ζ_1	1.0	571.97
ζ_1	1.5	1019.72
ζ_k	0.5	885.05
ζ_k	1.0	600.67
ζ_k	1.5	553.66
α	0.5	1099.01
α	1.0	611.17
α	1.5	240.89
X_0	0.5	229.30
X_0	1.0	526.06
X_0	1.5	469.44