CRAILM Biodiversity Monitoring Project

SMART Indicators Goals Report

July 2026

Submitted To:

Ministry of Agriculture & Lands, Forestry, Marine Resources & Cooperatives

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Project Context:

Climate-Resilient Agriculture for Integrated Landscape Management (CRAILM) Biodiversity Monitoring Project, funded by the United Nations Development Programme (UNDP) and the Global Environment Facility (GEF-6).

Recommended Citation:

Daniel, J., Harrison, B., & Thompson, R. (2026). SMART Indicators Goals Report: CRAILM Biodiversity Monitoring Project. Prepared for the Ministry of Agriculture & Lands, Forestry, Marine Resources & Cooperatives, Grenada. Gaea Conservation Network: St. George's, Grenada.

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Acknowledgements

The framework builds on two decades of nesting and in-water monitoring data compiled by Ocean Spirits Inc.; on Grenada Dove territory-mapping methods originally developed by Bonnie Rusk and by David Blockstein, digitised and standardised by Gaea Conservation Network; population viability work contributed by Dr. Catherine Peters and Dr. Matt Geary of the University of Chester; and on amphibian monitoring protocols established by Billie Harrison. Dr. Sophie Moittie and Shelley Lownds, of the St. George's University School of Veterinary Medicine, contributed to chytrid monitoring design. Dr. Kenrith Carter provided expertise on mongoose control and trained participants in trapping and control methods. Re:wild, through Justin Springer, provided technical guidance on AT220 trap configuration. The Grenada Dove Collaborative, formed following the Conservation Action Plan workshop to support the plan's implementation and bringing together more than 70 stakeholders, has provided a critical forum for coordinating conservation action across the species' range. The Grenada Forestry Division and the Ministry of Agriculture & Lands, Forestry, Marine Resources & Cooperatives provided input on institutional capacity, data-sharing, and integration with existing government monitoring infrastructure.

Executive Summary

This SMART Indicators Goals Report establishes specific, measurable monitoring targets for four priority species and one pathogen threat across the CRAILM Biodiversity Monitoring Project period. The 10-year monitoring framework spans January 2027 through 2036, with a formal review at the 2031 mid-point. Targets are framed against the baselines documented in the parallel Baseline Synthesis Report.

Targets are deliberately conservative, designed to be achievable through sustained effort while reflecting meaningful biological change. Grenada Dove monitoring combines territory mapping, point counts with distance sampling, and habitat occupancy. Grenada Frog monitoring uses repeat-season surveys across three indicator sites. Sea turtle monitoring integrates nesting beach surveys with in-water assessments. Mongoose monitoring combines camera-trap prevalence and detection probability, working toward an occupancy baseline, alongside a removal programme. Chytrid monitoring establishes a baseline and conducts annual surveillance.

Data are recorded on standardised online forms with offline capability, consolidated annually, shared with the Grenada Forestry Division and relevant agencies, and integrated into the Grenada Biodiversity Hub, where baseline estimates are displayed alongside year-by-year measurements. The report also presents three recommendations to the Government of Grenada: supporting the monitoring costs borne by Ocean Spirits Inc.; providing dedicated national funding for sustained mongoose control; and establishing a durable institutional home for chytrid surveillance.

Introduction

SMART – specific, measurable, achievable, relevant, and time-bound – describes a monitoring framework that links quantified baselines to defined targets, enabling practitioners to track progress, detect ecological change, and adapt management in response to field data. This report translates four priority species and one pathogen threat into actionable monitoring programmes for the period January 2027 through 2036, with a formal midpoint review in 2031.

All monitoring methods are grounded in published literature or established protocols. Field teams operate under standardised protocols, with data recorded on standardised online forms that retain offline capability for areas without cellular connectivity and synchronise when connectivity is restored. Consolidated data are archived to the project repository on the Open Science Framework (general repository) and surfaced publicly through the Grenada Biodiversity Hub (grenadabiodiversity.org). Species-specific repository links are provided within each section.

Grenada Dove (*Leptotila wellsi*)

The Grenada Dove is the most range-restricted species in this framework, and its monitoring programme is correspondingly the most detailed. It combines territory mapping, point counts with distance sampling, habitat occupancy, and breeding-season monitoring to track both population status and reproductive activity across the species' two fragmented populations. Gaea Conservation Network is the lead organisation, working with the University of Chester, St. George's University (Biology, Ecology & Conservation Department in the School of Arts & Sciences) and the Forestry Division to facilitate field access.

Baseline and Conservation Targets

The targets below are framed against the baselines established in the Baseline Synthesis Report. Each is set to detect meaningful change while remaining achievable under sustained monitoring effort.

Detection probability and occupancy are related but distinct parameters, and this year's monitoring establishes the first rather than the second. Detection probability describes how likely the Dove is to be recorded, given it is present; occupancy describes the probability that the Dove is actually present at a site. Estimating occupancy reliably requires enough repeat survey occasions per site to separate genuine absence from simple non-detection. This year's ARU and camera trap deployments ran three to eight days per unit, which is sufficient to estimate detection probability but falls short of the 14–30 day window needed for a defensible occupancy estimate (see Mongoose section). Detection probability is therefore reported here as

the necessary first step, establishing where survey effort currently stands and where it must be extended before occupancy modelling becomes possible.

Autonomous recording units (ARUs) were deployed by Gaea Conservation Network in 2026 to estimate Grenada Dove detection probability, capturing the species' distinctive call over a wide radius regardless of visibility. Camera trap data collected by Gaea in 2026 was also examined for the Dove directly; no Grenada Dove were recorded on camera traps at Mount Hartman, so a detection probability estimate for that site is not shown, while Perseverance produced an estimate of 0.667 (SE = 0.153).

At Black Bay, the Dove was detected every day ARUs were deployed. With only three days of data, this produces a detection probability estimate near 1.0, but the estimate is not precise, and would very likely change with a longer deployment.

No territories were confirmed at either site this year, by either Gaea Conservation Network or the University of Chester (Peters & Geary, 2025). Individual calling males were detected at both sites, but not consistently within the same clustered location across repeat visits. Whether this reflects a shift in breeding timing outside the surveyed window, a genuine decline in the number of territorial males, or both, remains unclear and is a priority question for the coming monitoring period.

Metric	Baseline	2036 Target
Distance sampling (Rivera-Milán et al. 2015)	160 ± 30 (SE) individuals 95% CI: 107–229*	Stabilise or increase at ≥229 individuals (upper 95% CI bound); no net loss
Territory mapping (Rusk, 2017; Blockstein, 1988, 1991)	70 ± 12 (SE) territorial males, calculated from three historical counts – 1987: 50; pre-Hurricane Ivan 2003–04: 91; 2007: 68 95% CI: 46–93*	Maintain or increase count; target ≥93 territorial males (upper 95% CI bound)
Detection probability – territory mapping (Peters, Geary, 2025)	Mount Hartman: 0.95 (SE = 0.049), Perseverance: 0.33 (SE = 0.12)	Establish detection probability at all monitored sites with SE < 0.10
Detection probability – ARU (Gaea Conservation Network, 2026)	Black Bay: 1.00 (see note above), Mount Hartman: 0.88 (SE = 0.065), Perseverance: 0.88 (SE = 0.078), Woburn: 0.75 (SE = 0.153)	Reduce CI width through extended deployment; establish comparable precision across sites
Detection probability – camera trap (Gaea Conservation Network, 2026)	Mount Hartman: not estimable (zero detections); Perseverance: 0.667 (SE = 0.157)	Establish detection probability at both sites

Metric	Baseline	2036 Target
Occupancy	Not yet estimable; 2026 deployments (3–8 days per unit) insufficient to support modeling	Establish site-level occupancy baseline by 2027
Habitat area (Rusk 2017; Gaea Conservation Network surveys 2025–2026)	444 ha across six sites	Maintain or expand through restoration

**The distance-sampling 95% CI (107–229) is asymmetric because it derives from a log-normal density model (Rivera-Milán et al. 2015) and is taken directly from the published estimate. The territory-mapping 95% CI (46–93) is a standard normal-theory interval (mean ± 1.96 SE) calculated by Gaea Conservation Network from three historical territorial-male counts – 1987: 50; pre-Hurricane Ivan 2003–04: 91; 2007: 68 (Blockstein 1988, 1991; Rusk 2008a) – treated as independent samples for this calculation.*

Monitoring Methodology

Four field methods run concurrently across the monitoring period. Territory mapping and point counts with distance sampling provide complementary measures of population status; habitat occupancy extends coverage beyond the survey trails; and breeding-season monitoring resolves the species' reproductive timing. Each method, its sites, and its recording window are set out below.

Territory Mapping

Territory mapping involves repeated auditory and visual surveys along defined trails to confirm the presence and stability of individual territorial males across seasons. Traditionally, detection locations were plotted by hand onto paper maps in the field; Gaea Conservation Network's protocol replaces this with a GPS-enabled digital form deployed via KoboToolbox, which captures the observer's coordinates at the moment of each detection and feeds directly into a spatial database – removing the transcription step and improving both accuracy and consistency across surveyors. Surveyors conduct a minimum of five visits per trail during the morning calling period, from 0630 to 1000, in the documented breeding months. The method is applied at two primary sites: Perseverance, with three standardised trails, and Mount Hartman, with four. The underlying survey design was digitised and standardised by Gaea Conservation Network from the long-term work of Rusk and Blockstein.

To confirm a territory, a dove must be detected within the same defined radius on at least three of five visits, a threshold that distinguishes a resident territorial male from a transient detection. True Grenada Dove territory size has not been established in the literature, so this radius is derived indirectly rather than measured directly. Blockstein (1991) documented 32 territories concentrated along a single 1 km ridge at Mount Hartman, averaging roughly 34 m of spacing between territories at the site's peak density; a clustering threshold at or above this figure risks

merging two real, adjacent territories into one. Rivera-Milán et al. (2015) support a tight radius from a different angle, documenting doves calling repeatedly from the same perch over prolonged periods with little responsive movement when approached, consistent with treating closely clustered detections as a single bird or territory. Gaea Conservation Network therefore applied a clustering distance under 35 m, in contrast to the 50 m radius used by Peters & Geary (2025) in their concurrent territory mapping.

Figure S-D1. *Territory-mapping trail network for the Grenada Dove, showing the four standardised trails at Mount Hartman on the southwestern peninsula and the three trails at Perseverance on the western coast. Surveyors walk these fixed trails during the morning calling period, from 0630 to 1000, in the documented breeding months, recording each territorial male heard or seen so that territory occupancy and cluster stability can be tracked from year to year against the baseline of 70 ± 21 territorial males.*

Point Counts with Distance Sampling

Point counts with distance sampling follow the method of Rivera-Milán et al. (2015) so that estimates remain directly comparable to the baseline estimate of 160 ± 30 individuals. A team of two observers occupy fixed points distributed across a systematic grid covering the same habitat area sampled in that study; comparability depends on holding the survey area and the half-normal detection model constant. At each point, the team records all doves heard or seen over six minutes, together with distance estimates. Moving doves are excluded from density estimates unless their initial locations can be ascertained during or after the count. Distance sampling analysis estimates density and absolute population size. In the baseline study, a grid of 180 points was established across the survey region; survey effort consisted of two visits to 79 of those points, yielding 33 detections within 340 m of point centres.

To detect real changes in the population over time, the estimate from each survey round needs to be precise enough that the uncertainty around it does not swamp the signal. Rivera-Milán et al. (2015) express this as a target coefficient of variation – the ratio of the standard error to the estimated population size – of no more than 0.15, meaning the standard error should be no greater than 15% of the estimate. Reaching that level of precision requires sufficient detections, which in turn requires sufficient survey effort. The authors calculate that surveying 150 points twice per season during the peak calling period in late July and early August would yield approximately 63 detections – enough to meet the precision target even if dove spatial distribution becomes more clumped than observed in 2013.

Applying the same spacing rules, two independent point grids were generated: 63 points across core habitat at 400 m spacing, and 105 points across potential habitat at 1,000 m spacing. Core habitat boundaries were drawn from the current known range of the Grenada Dove, based on Rusk (2017), surveys conducted through 2013, and Gaea Conservation Network habitat mapping carried out in 2025–2026 using visual, auditory, and acoustic monitoring. Potential habitat was defined by the survey region of Rivera-Milán et al. (2015). The two grids were merged, with potential habitat points falling within 1,000 m of any core habitat point removed to maintain consistent spacing between habitat categories. This yielded a combined grid of 124 survey points, shown in the figure below. The 150-point target is not achievable at the recommended spacing given the spatial extent of confirmed and potential Grenada Dove habitat across the island; 124 points represents the maximum feasible effort under the Rivera-Milán et al. (2015) design.

Density estimates from distance sampling are converted to an absolute population size by multiplying estimated density – expressed as individuals per hectare – by the total area of the survey region. In the baseline study, an estimated density of 0.021 individuals per hectare,

applied to the 7,621 ha survey region, yielded a population estimate of 160 ± 30 individuals. Holding the survey region constant across monitoring rounds is therefore as important as holding the detection model constant: if the area changes, the population estimates are no longer directly comparable even if the density estimates are accurate.

Figure S-D2. *Point-count grid for distance sampling across confirmed and potential Grenada Dove habitat. The 124 survey points comprise a 400 m grid across core habitat and a 1,000 m grid across potential habitat, with potential habitat points maintained at least 1,000 m from any core habitat point. Core habitat boundaries reflect the current known range of the Grenada Dove based on Rusk (2017), surveys through 2013, and Gaea Conservation Network's field mapping in 2025–2026; potential habitat follows the survey region of Rivera-Milán et al. (2015). Two visits per point per season are conducted during the peak calling period.*

Habitat Occupancy and Autonomous Recording Units

Occupancy monitoring uses autonomous recording units (ARUs) deployed within the mapped 444-hectare habitat, in areas outside the Perseverance and Mount Hartman trail networks, to document presence where trail-based surveys do not reach. Units record during dawn hours, from 0500 to 1000, in deployment blocks during peak breeding months, and occupancy modelling tracks whether sites remain occupied from year to year and whether occupancy responds to mongoose control or habitat management. Exact deployment points will be determined at implementation; the framework commits only to coverage within the mapped habitat outside the trails.

Breeding-Season Monitoring

The documented breeding season runs from June through December, but observations in 2025 recorded nesting as early as March, with fledglings in April. To resolve whether breeding phenology is shifting, surveys will run year-round from 2027 to 2029. Once the breeding window is confirmed, survey effort in later years will concentrate during the confirmed period to allow more efficient monitoring.

Data Management

Dove territory data are captured on the standardised territory-mapping form (Kobo form), which records location, date, time, weather, observer, and observations, and retains offline capability for use without connectivity. Data are consolidated annually for distance sampling, occupancy modelling, and trend analysis, archived to the repository (Dove methods; Dove data), shared with the Forestry Division, and surfaced on the Grenada Biodiversity Hub.

Grenada Frog (*Pristimantis euphronides*)

Grenada Frog monitoring uses repeated auditory and visual surveys across three indicator sites representing distinct elevation and ecological conditions, sampled across three seasons each year to detect changes in relative abundance and responses to chytrid emergence, habitat management, and invasive species control. Monitoring is led by Billie Harrison, whose long-term dataset underpins the baseline, with support from Gaea Conservation Network.

Baseline and Conservation Targets

The site-level targets below are framed against the catch-per-unit-effort baselines established in the Baseline Synthesis Report, with each site held against its own reference value.

Site	Baseline CPUE (frogs/hr)	2036 Target
Grand Étang (St. Andrew)	1.80 ± 0.26 (SE) 95% CI: 1.29–2.31	Maintain ≥2.31 frogs/hr (upper 95% CI bound)
Les Avocats (St. David)	2.67 ± 0.61 (SE) 95% CI: 1.47–3.87	Maintain ≥3.87 frogs/hr (upper 95% CI bound)
Mount Kublal (St. Andrew)	14.12 ± 1.04 (SE) 95% CI: 12.08–16.16	Maintain ≥16.16 frogs/hr (upper 95% CI bound)

Monitoring Methodology

Surveys use auditory and visual encounter methods, in which trained observers search appropriate microhabitats – leaf litter, fallen logs, moss-covered roots, and vegetation near stream margins – for a fixed period, recording all frogs detected (Harrison & Beston, 2026). Surveys run three times per year across distinct seasons: dry, early wet, and late wet (Harrison & Beston, 2026). Effort is standardised, with three 100-m transects established at each of the three sites. Two observers cover each 100-m transect in 30 minutes, resulting in one hour of search effort per transect per survey, yielding catch-per-unit-effort for trend analysis (Harrison & Beston, 2026). Observers also record weather, microhabitat condition, and any invasive frogs encountered to track community composition (Harrison & Beston, 2026; Harrison et al., 2011). Protocols remain consistent with Harrison's 2004–2020 methods so that baseline and monitoring data are directly comparable (Harrison & Beston, 2026).

Data Management

Frog survey data – site, date, season, effort in hours, and counts of native and invasive frogs – are recorded on the standardised survey form (Kobo form), offline-capable, and consolidated annually into per-site and per-season Catch per Unit Effort (CPUE) indices. Results are archived to the repository (Frog repository), shared with the Forestry Division, and surfaced on the Grenada Biodiversity Hub.

Sea Turtles

Sea turtle monitoring integrates nesting beach surveys, focused on leatherbacks as the primary nesting species, with in-water assessments tracking abundance and life-stage distribution across all five species. Ocean Spirits Inc. is the lead organisation and data steward, with support from the Fisheries Division.

Baseline and Conservation Targets

The targets below are framed against the nesting and in-water baselines established in the Baseline Synthesis Report. Nesting targets prioritise arresting the decline before pursuing recovery toward the historical average.

Species / Metric	Baseline	2036 Target
Leatherback nesting (2004–2024 average)	567 ± 320.8 (SD) nests/season 95% CI: 430–704	Arrest decline; stabilise and trend upward
Leatherback recent counts	193 (2023); 117 (2024)	Increase trend toward historical average
Leatherback hatching success	25–40%	Improve to >50% through nest protection
Hawksbill in-water (2023)	37 individuals	Maintain ≥37 individuals
Green in-water (2023)	51 individuals	Maintain ≥51 individuals

Nesting Beach Surveys

Nesting beach surveys involve nightly patrols, conducted from 19:30 to 06:00, during the leatherback nesting season, from March to August, at designated index beaches, with Levera Beach as the primary location. Monitors walk the full beach, documenting new nests, nest locations by GPS, and any evidence of predation or disturbance. Nests are excavated 70 days post-oviposition, or two days after observed emergence, to allow adequate time for all viable hatchlings to emerge naturally, and counts of viable eggs, infertile eggs, live hatchlings, and dead hatchlings yield site- and beach-wide hatching success.

In-Water Population Surveys

In-water surveys document abundance and life-stage distribution at nearshore and offshore foraging grounds using in-water free-diving tag-and-release studies through standardized survey zones, typically over two to three weeks per season at multiple sites. Trained divers record species, life stage, and any identifying marks or tags, and encounter rates and population estimates are derived from repeated observations. The methodological framework follows

established regional programmes (Ocean Spirits Inc. 2023, 2024; Eckert & Eckert 2019), and surveys are conducted at least twice per monitoring year, ideally in spring and autumn.

Data Management and Recommendation

Sea turtle data – nesting totals, hatching success, predation events, and in-water encounters by species and life stage – are recorded and maintained by Ocean Spirits Inc. Data stewardship sits with Ocean Spirits Inc., and results are shared with the Fisheries Division annually.

Recommendation: Given the sustained effort that nesting and in-water monitoring require, and the central role of these datasets in national and regional reporting, the government should commit to supporting the monitoring costs borne by Ocean Spirits Inc. so that the long-term dataset is not interrupted.

Small Indian Mongoose *(Urva auropunctata)*

Mongoose monitoring combines occupancy assessment by camera traps with a direct removal programme, tracking distribution, occupancy dynamics, and cumulative removal. These metrics inform adaptive predator control in support of native fauna recovery. Gaea Conservation Network intends to support this work, but a sustained programme depends on dedicated national resourcing, as set out in the recommendation below.

Baseline and Conservation Targets

Prevalence, detection probability, and occupancy are related but distinct measures, drawn here from three separate datasets rather than one consistent survey design. Prevalence is the raw proportion of camera sites at which a species was recorded at least once, with no correction for the possibility that the species was present but not detected; the 85 per cent Mount Hartman and 22 per cent Perseverance baselines below come from Peters & Geary's 2025 trail-camera survey. Detection probability describes how likely a mongoose is to be photographed at a camera site, given it is present, and was estimated from a separate 2026 deployment run over shorter three-to-eight-day rotations specifically to compare detection patterns across sites. Occupancy corrects for imperfect detection directly, estimating the true probability a site is occupied from repeat survey occasions; this requires camera deployments long enough to distinguish genuine absence from simple non-detection, a threshold this programme treats as a minimum of 14 days per unit, extended further at low-density sites where more survey occasions are needed to achieve the same detection confidence (Burton et al. 2015; Goldstein et al. 2024). Neither the 2025 prevalence survey nor the 2026 detection-probability deployment met that threshold, so occupancy remains unestablished and is set as a 2027 baseline target below.

Metric	Baseline (2025)	2036 Target
Prevalence – camera trap (Peters & Geary, 2025)	Mount Hartman: 85%, Perseverance: 22%	Mount Hartman: reduce to ≤75% through removal; Perseverance: maintain ≤20% or reduce further
Detection probability – camera trap (Gaea Conservation Network, 2026)	Mount Hartman: ~0.42 (90% CI 0.22–0.65); Perseverance: ~0.22 (90% CI 0.07–0.52)	Establish detection probability at all monitored sites with SE < 0.10
Occupancy	Not yet estimable; 2026 deployments (three-to-eight-day rotations) insufficient to support modelling	Establish site-level occupancy baseline by 2027
Annual removal target	≥1,305 individuals/year	Maintain ≥1,305 individuals/year
Island-wide density estimate	~6–6.6 individuals/ha	Reduce by ≥10% at managed sites

Prevalence, Detection Probability, and Occupancy Assessment

Going forward, cameras will be deployed across managed and unmanaged sites for a minimum of 14 days per unit, extended longer at low-density sites, following systematic grid points or habitat corridors and standardised bait to equalise encounter probability across sites. This single deployment design will support all three measures going forward – prevalence as reported, detection probability as an intermediate output, and occupancy as the modelled estimate that corrects for imperfect detection – so that future years are directly comparable to one another rather than drawing on three separately designed surveys as the 2025–2026 baseline period did. Occupancy modelling, once a sufficient deployment window is established, will estimate site-specific and multi-site occupancy and detection probabilities, yielding estimates directly comparable across years.

Removal and Population Control

Removal occurs year-round, with effort intensified during the sea turtle nesting season and the Grenada Dove activity period. The programme treats the AT220 self-resetting kill trap as a core option for sustained removal in protected areas, since it reduces the staffing burden that limits the Forestry Division's capacity for manual servicing. The AT220 can be configured for daytime-only operation through the NZ Autotraps app, avoiding activity during nesting or roosting hours for non-target species; this setting persists on the trap until manually reversed and does not require daily reconfiguration (Springer 2026). Live traps and targeted shooting complement the kill traps, and the live-trap training delivered to date provides the basis for a wider national trapping effort. All removals are logged with the date, location by GPS, method, and individual condition. The annual target is at least 1,305 individuals/year, consistent with the GEF-6 commitment.

Data Management and Recommendation

Camera-trap and removal data are recorded on the standardised, offline-capable form (Kobo form, currently under revision) and consolidated annually into occupancy trends and cumulative removal totals. Results are archived to the repository (Mongoose repository), shared with the Forestry Division, and surfaced on the Grenada Biodiversity Hub.

Recommendation: The Forestry Division operates with limited staff, and sustained mongoose control across protected areas and watersheds cannot be maintained on project funding alone. A dedicated national trapping programme, building on the live-trap training already delivered and resourced through national funding, is required to sustain and build on the gains targeted here.

Chytridiomycosis (*Batrachochytrium dendrobatidis*)

Chytrid surveillance is led by the St. George's University School of Veterinary Medicine, which is conducting ongoing research on the distribution and prevalence of *Batrachochytrium dendrobatidis* (Bd) across Grenada's amphibian populations.

Baseline and Surveillance Targets

An island-wide survey conducted in 2026 by Shelley Lownds and Dr. Sophie Moittie of the St. George's University School of Veterinary Medicine found no positive detections for Bd across 211 individuals of five species at 36 locations (Lownds & Moittie, unpublished data). This survey establishes the baseline: Bd has not been detected on Grenada to date. The monitoring goal is the early detection of any future introduction or emergence.

Metric	Baseline status	2027–2036 target
Chytrid across all amphibian species	Not detected (2026, Lownds et al., unpublished data)	Detect any future introduction or emergence
Alert threshold	Not detected	Any positive detection at any site triggers immediate escalation to the Forestry Division and relevant agencies

Monitoring Methodology

Ongoing surveillance is conducted by the St. George's University School of Veterinary Medicine through swab sampling of amphibians across multiple sites, with samples analysed by quantitative PCR. Field sampling follows biosafety protocols to prevent transmission between sites.

Data Management and Recommendation

Results are recorded and consolidated by the SGU research team and shared with the Forestry Division. Any positive detection triggers immediate notification to the Forestry Division to initiate rapid response, and findings are surfaced on the Grenada Biodiversity Hub.

Recommendation: The Grenada Forestry Division should establish a formal partnership with the St. George's University School of Veterinary Medicine to ensure that amphibian disease surveillance continues on a sustained and institutional basis beyond the current research programme.

Monitoring Schedule and Review

The framework runs for ten years, from January 2027 through 2036. Rather than a fixed month-by-month calendar, it sets a recurring annual cycle and a single midpoint review, which keeps the schedule realistic against field seasons and resourcing.

Each year, field data are collected on the seasonal cadence described in the species sections, consolidated through the standardised forms, archived to the repository, and surfaced on the Grenada Biodiversity Hub, with results shared annually with the Forestry Division and relevant agencies. A formal review at the 2031 midpoint assesses progress against each target and informs any adjustment to method or effort, including the planned narrowing of Grenada Dove survey effort once breeding phenology is confirmed. At the 2036 endpoint, a consolidated assessment of the full monitoring record supports planning for monitoring beyond the project period.

Summary of Monitoring Targets

The table below consolidates the baselines, targets, primary methods, and data frequency for all five monitoring programmes in a single view. It is rendered in a smaller type to keep each row on one line; full detail is provided in the species sections above.

Programme	Baseline	2036 Target	Primary Method	Data Frequency
Grenada Dove	107–229 individuals (95% CI); 46–93 territorial males (95% CI); 444 ha; occupancy not yet estimable	Stabilise ≥229; maintain ≥93 males; maintain or expand	Territory mapping; point counts with distance sampling; ARU occupancy	Annual; year-round 2027–2029 for phenology
Grenada Frog	CPUE 1.29–2.31 / 1.47–3.87 / 12.08–16.16 frogs/hr (95% CI) across three sites	Maintain ≥2.31 / ≥3.87 / ≥16.16 frogs/hr (upper 95% CI bounds)	Auditory and visual encounter surveys	Three seasons per year
Sea Turtles	Leatherback 567 ± 320.8 average; hatching 25–40%; hawksbill 37; green 51	Arrest decline; hatching >50%; maintain in-water counts	Nesting beach surveys; in-water surveys	Annual; in-water twice per year
Small Indian Mongoose	Prevalence 85% / 22%; density ~6–6.6 individuals/ha; occupancy not yet estimable	Prevalence ≤75% / ≤20%; remove ≥1,305 individuals/year; density −10%; establish occupancy baseline by 2027	Camera-trap prevalence; occupancy modelling (from 2027); removal logging	Annual; removal year-round
Chytridiomycosis	Not detected (Lownds & Moittie 2026, unpublished)	Detect any future introduction or emergence; any	qPCR swab sampling	Ongoing – led by SGU School

Programme	Baseline	2036 Target	Primary Method	Data Frequency
		positive detection triggers immediate escalation		of Veterinary Medicine

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