GAEA
Conservation Network

CRAILM Biodiversity Monitoring Project

Baseline Synthesis Report

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Arthur Daniel (top left); Greg Homel (top right); Reginald Joseph (bottom left); Ezra Campbell-Lucas (bottom right)

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Acknowledgements

This Baseline Synthesis Report draws on the expertise, field data, and collaboration of numerous partners committed to conserving Grenada's biodiversity. Their contributions are recognised below.

Ocean Spirits Inc. provided two decades of nesting and in-water monitoring data, establishing the empirical foundation for the sea turtle baselines presented in this report. Bonnie Rusk's long-term habitat mapping and territory surveys provide the most comprehensive baseline for Grenada Dove distribution and ecology available to date. The territory-mapping methodology applied under this project was originally developed by Bonnie Rusk and by David Blockstein, and later digitised and standardised by Gaea Conservation Network and Dr. Catherine Peters and Dr. Matt Geary of the University of Chester.

Billie Harrison's amphibian monitoring, conducted between 2004 and 2020 at three high-elevation sites, provides the baseline indices for the endemic Grenada Frog. The Grenada Forestry Division coordinated field access and provided institutional support across protected areas and monitoring sites. Dr. Kenrith Carter provided expertise on mongoose control, trained participants in trapping and control methods, and provided ongoing support to Grenada Dove monitoring. The Grenada Dove Collaborative, formed following the Conservation Action Plan workshop to support the plan's implementation and bringing together more than 70 stakeholders, continues to provide a critical forum for coordinating conservation action across the species' range. Dr. Sophie Moittie and Shelley Lownds, of the St. George's University School of Veterinary Medicine, are collaborating on the assessment of chytrid fungus in Grenada.

We extend our gratitude to all stakeholders, government agencies, research collaborators, and community members whose expertise and support contributed to the development of these biodiversity baselines.

Executive Summary

This Baseline Synthesis Report establishes the current ecological state of four priority species – the Grenada Dove, the Grenada Frog, sea turtles, and the small Indian mongoose – together with one emerging disease threat, chytrid fungus, across key biodiversity areas in Grenada. It integrates long-term field datasets, ongoing monitoring through 2026, and published literature to establish measurable baselines against which future change can be tracked.

The Grenada Dove persists in two geographically isolated populations across 444 hectares of habitat, separated by roughly nine kilometres of urban development. A distance sampling survey estimated 160 ± 30 individuals, and historical territory-mapping counts average 70 ± 21 territorial males. Habitat loss, mongoose predation, and extreme weather continue to threaten the species, which is classified as Critically Endangered. Sea turtles, particularly leatherbacks, are ecological keystone species under severe pressure. Leatherback nesting at Levera Beach has fallen well below the long-term average of 567 ± 320.8 nests per season, with 193 nests recorded in 2023 and 117 in 2024, while hatching success is abnormally low. The endemic Grenada Frog is restricted to montane forest above 300 metres and faces competition from an introduced congener, forest loss, and the presence of a lethal fungal pathogen. The small Indian mongoose, introduced in the 1870s and now numbering roughly 200,000 individuals island-wide, exerts heavy predation pressure on native fauna and is the primary reservoir of rabies in Grenada. Chytrid fungus, confirmed present since 2009, threatens the endemic frog, with collaborative research underway to establish distribution and prevalence.

These baselines provide the quantitative and ecological foundation for the SMART monitoring targets set out in the parallel SMART Indicators Goals Report, which frames conservation targets across the 2027–2036 monitoring period with a review in 2031.

Introduction

Grenada's biodiversity faces multiple, compounding pressures: habitat loss from historical land conversion and ongoing development; predation and competition from introduced species; emerging disease; and accelerating climate change. This report establishes current ecological conditions for four priority species and documents one significant pathogen threat, drawing on published literature, long-term field surveys, and ongoing monitoring through 2026.

Each species section synthesises available data on distribution, population status, habitat and ecology, and primary threats. Where data are limited, the section identifies the gap rather than relying on assumption. The figures in this report are maps of distribution and habitat area. Where indicated, they are presented as placeholders and will be completed prior to final publication. Quantitative baselines are stated in the narrative because the maps depict spatial extent rather than population values.

Grenada Dove *(Leptotila wellsi)*

The Grenada Dove is the national bird of Grenada and one of the most range-restricted birds in the Caribbean. This section presents the species' baseline taxonomy, distribution, population status, habitat and ecology, and threats, drawing on historical survey and mapping data through 2013 and ongoing monitoring through 2026.

Taxonomy and Evolutionary History

The Grenada Dove was first described to science in 1884 by George N. Lawrence from a specimen collected by James G. Wells at Fontenoy, Grenada (Lawrence 1884). Although historically treated as a subspecies of the Gray-fronted Dove (*Leptotila rufaxilla*), it was later recognised as a distinct endemic species on the basis of several diagnostic traits – a white abdomen, reduced white on the tail tips, and red orbital skin – together with a distinctive descending coo repeated every seven to eight seconds (Blockstein & Hardy 1989). Phylogenetic analysis using mitochondrial and nuclear DNA confirmed the species as a genetically distinct taxon, sharing a most recent common ancestor with the Grey-chested Dove (*Leptotila cassinii*) and Grey-headed Dove (*Leptotila plumbeiceps*) approximately 2.53 million years ago (Peters et al. 2022).

Distribution and Population Status

The Grenada Dove is endemic to Grenada and confined to two fragmented, geographically isolated areas: the southwestern peninsula, including Mount Hartman Estate, Woodlands, and Petit Bouc; and the western coast, including Perseverance, Beausejour, Woodford, and Black Bay (Rivera-Milán et al. 2015; Rusk 2017). These populations are separated by roughly nine kilometres of continuous urban development, resulting in genetic isolation, low mitochondrial diversity, and unique haplotypes in the western population (Peters et al. 2023). A distance sampling survey estimated 107–229 individuals (95% CI; point estimate 160 ± 30 SE) across the 7,621 ha survey region (Rivera-Milán et al. 2015). Averaging three historical territory-mapping counts – 1987: 50; pre-Hurricane Ivan 2003–04: 91; 2007: 68 (Rusk 2017; Blockstein 1988, 1991) – yields a baseline of 46–93 territorial males (95% CI; mean 70 ± 12 SE). Recent genetic evidence indicates a male-skewed sex ratio (Peters et al. 2023), which reduces the effective population size and further elevates extinction risk (Peters et al. 2025). However, more recent surveys at Mount Hartman and Perseverance, along historical trails, reported detection probabilities of 0.95 (SE = 0.049) and 0.33 (SE = 0.12) respectively (Peters & Geary, 2025).

No territories were confirmed at either site in 2026, by either Gaea Conservation Network or the University of Chester in their 2025 survey (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.No territories were confirmed at either site in 2026, by either Gaea Conservation Network or the University of

Chester in their 2025 survey (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.

Autonomous recording units (ARUs) deployed in 2026 across Mount Hartman, Perseverance, and additional known habitat at Black Bay and Woburn recorded the species throughout the deployment period at all four sites, though rotation lengths of three to eight days per unit limited the precision of site-level detection estimates (Figure D1).

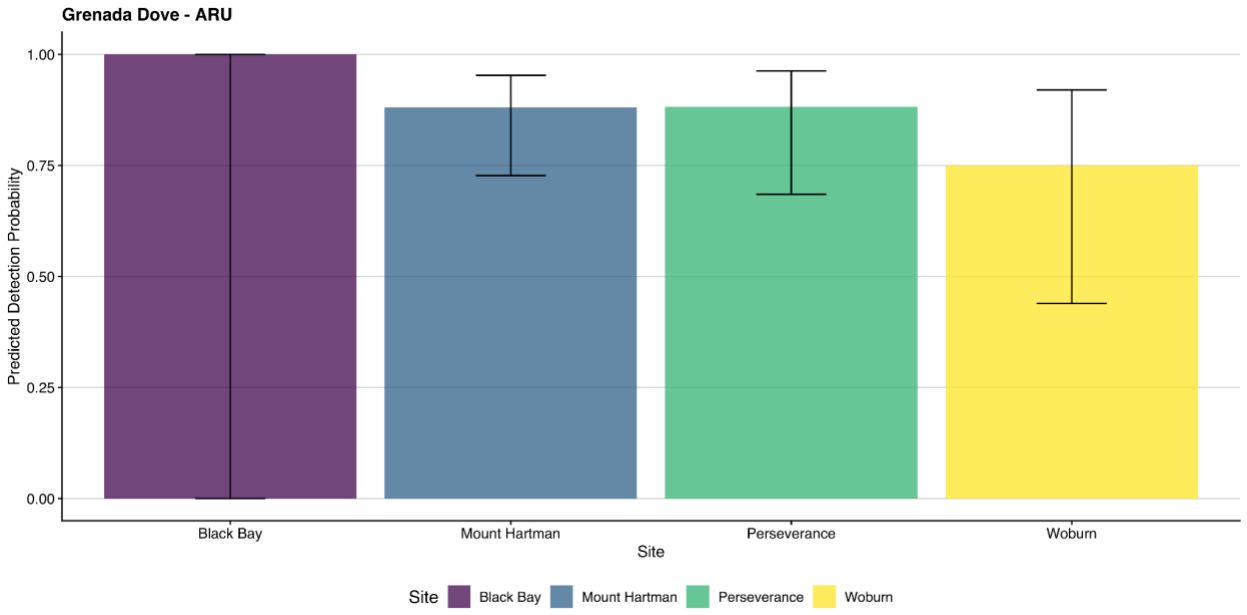

Figure D1. *Predicted Grenada Dove detection probability by site from 2026 autonomous recording unit (ARU) deployments at Black Bay, Mount Hartman, Perseverance, and Woburn. Error bars show 90% confidence intervals. Short rotation lengths (three to eight days per unit) limit the precision of site-level estimates, particularly at Black Bay.*

No Grenada Dove were recorded on camera traps at Mount Hartman during this period (Figure D2), despite detections at Perseverance, though this more likely reflects low camera trap detectability at that site than absence of the species.

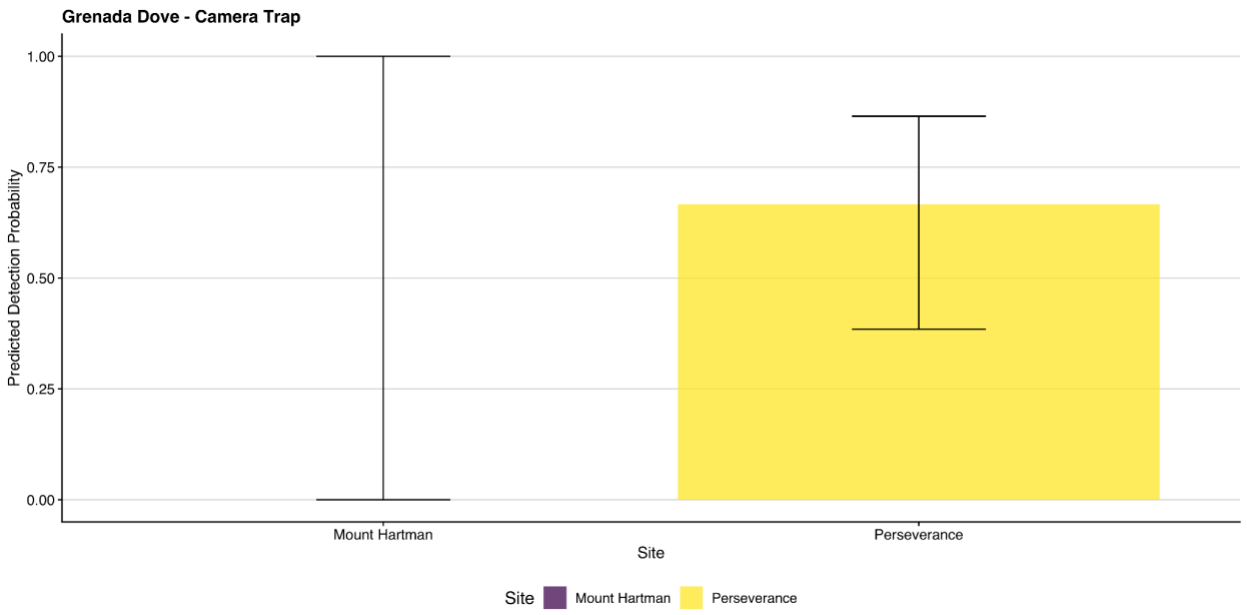

Figure D2. *Predicted Grenada Dove detection probability by site from 2026 camera trap deployments at Mount Hartman and Perseverance. No Grenada Dove were recorded on camera traps at Mount Hartman during this period; the resulting point estimate for this site is not statistically identifiable, with a 90% confidence interval spanning the full 0–1 range, and should not be interpreted as a reliable detection probability.*

Habitat and Ecology

Grenada Doves depend on secondary seasonal coastal dry forest, mixed deciduous forest, and xeric scrub-woodland (Rusk 2017). High canopy cover is the strongest environmental predictor of dove presence, while the presence of leguminous trees positively influences density (Bolton et al. 2016; Rivera-Milán et al. 2015). The species is highly terrestrial, spending most of its time walking and foraging on the forest floor and fleeing on foot into underbrush rather than flying. Its diet consists of seeds, invertebrates, and fleshy fruits, including papaya (*Carica papaya*) and Bourreria succulenta (Twyman & Hayslette 2007).

Breeding has historically been documented during the rainy season. During this period, territorial males call from perches three to five metres high and pairs build fragile stick nests in shrubs and trees (Blockstein 1991; Twyman & Hayslette 2007). Observations in 2025, however, recorded nesting activity as early as March, with fledglings in April, suggesting the breeding window may be broader than previously documented. Imputed life-history traits indicate a slow breeding rate: an average clutch of two eggs, an incubation period of 14.2 days, and approximately 1.4 clutches per year (Peters et al. 2022). The species relies on standing water from man-made wells during the dry season, leaving it particularly vulnerable to drought (Bolton et al. 2016).

Habitat Baseline

Grenada Dove habitat totals 444 hectares across six sites, based on mapping data collected through 2013 (Rusk 2017). Mount Hartman holds the largest contiguous habitat block at 145.7 hectares, followed by the Woodford–Perseverance–Beausejour–Grenville Vale complex, which covers a combined 203.2 hectares. The remaining area comprises Petit Bouc Golf Course (48.19 ha), Black Bay (23.4 ha), Springs (18.05 ha), and Lower Woburn (5.39 ha). This fragmented distribution reflects the limited remaining patches of suitable coastal forest interspersed with agricultural land, residential development, and degraded vegetation. The distribution map below shows the six sites and their relative extent.

Figure D3. *Distribution of Grenada Dove habitat across the six mapped sites, totalling 444 hectares: Mount Hartman (145.7 ha, the largest contiguous habitat block) on the southwestern peninsula, the Woodford–Perseverance–Beausejour–Grenville Vale complex (203.2 ha combined) on the western coast, and the smaller patches at Petit Bouc Golf Course, Black Bay, Springs, and Lower Woburn. The map shows the relative extent of each patch and the roughly nine-kilometre band of continuous urban development that separates the two genetically isolated population centres (after Rusk 2017).*

Threats and Conservation Status

The Grenada Dove is listed as Critically Endangered as a result of several severe and compounding threats (Rusk 2017; Peters et al. 2025). The principal pressures are summarised below.

- **Habitat loss and fragmentation**. Residential and commercial development, including proposed luxury tourist resorts at Mount Hartman, together with small-scale agriculture and fire, continue to reduce and fragment the species' remaining dry-forest habitat (Rosenberg 2018; Rusk 2017).
- **Introduced predators**. Small Indian mongooses, rats, opossums, and feral cats prey on nests and fledglings, depressing reproductive success (Bolton et al. 2016; Twyman & Hayslette 2007).
- **Extreme weather**. Hurricane Ivan in 2004 caused significant habitat destruction and subsequent population decline, illustrating the species' exposure to intensifying storm activity (Rusk 2017).
- **Disease**. The potential spread of water-borne diseases such as trichomonosis at shared water sources is an ongoing concern, given the species' dependence on man-made wells (Bolton et al. 2016).

In response, the Government of Grenada designated the dove as the national bird in 1991 and established the Mount Hartman National Park and the Perseverance Dove Sanctuary, although these protected areas together cover less than ten per cent of the species' historic range (Bolton et al. 2016; Rosenberg 2018). Active predator control has been implemented at these sites (Rusk 2017). Population viability analysis predicts a high probability of extinction if commercial development at Mount Hartman proceeds, and recommends direct intervention such as population supplementation or head-starting to secure the species' long-term survival (Peters et al. 2025).

Grenada Frog (*Pristimantis euphronides*)

The Grenada Frog is a small endemic amphibian restricted to the island's high-elevation forests. This section presents its biology, distribution, baseline population indices, and threats, drawing on monitoring data spanning 2004–2020 and ongoing fieldwork to 2026.

Overview and Biology

The Grenada Frog (*Pristimantis euphronides*) is endemic to Grenada and was originally classified in the genus Eleutherodactylus before being reassigned to the family Strabomantidae (Hedges et al., 2008, as cited in Harrison et al., 2011). It is a small frog: males average 22.7 millimetres in snout-vent length, while females are substantially larger at 28.3 millimetres (Kaiser et al., 1994, as cited in Harrison et al., 2011). The species is a direct developer, bypassing the tadpole stage so that froglets hatch directly from terrestrial eggs. Reproduction requires moist substrates in which the frogs excavate nests. Females are solely responsible for protecting the egg clutch until hatching, and have not been observed to feed during this brooding period, expending significant metabolic reserves in the process (Harrison & Beston 2026; Harrison et al. 2011).

Distribution and Habitat

The Grenada Frog is heavily restricted to high-elevation cloud and montane forest, occurring exclusively above 300 metres (Harrison & Beston, 2026; Harrison et al., 2011). It depends on cool, moist air, dense canopy, and substrates such as moss-covered decaying vegetation in which it digs diurnal retreats (Harrison et al., 2011). The species was historically more widespread, but its current distribution is estimated at 16 square kilometres or less, with populations now confined to remnant montane forest patches (Hedges, 1999, as cited in Harrison et al., 2011.). The habitat map below identifies land above the 300-metre contour and the three indicator survey sites.

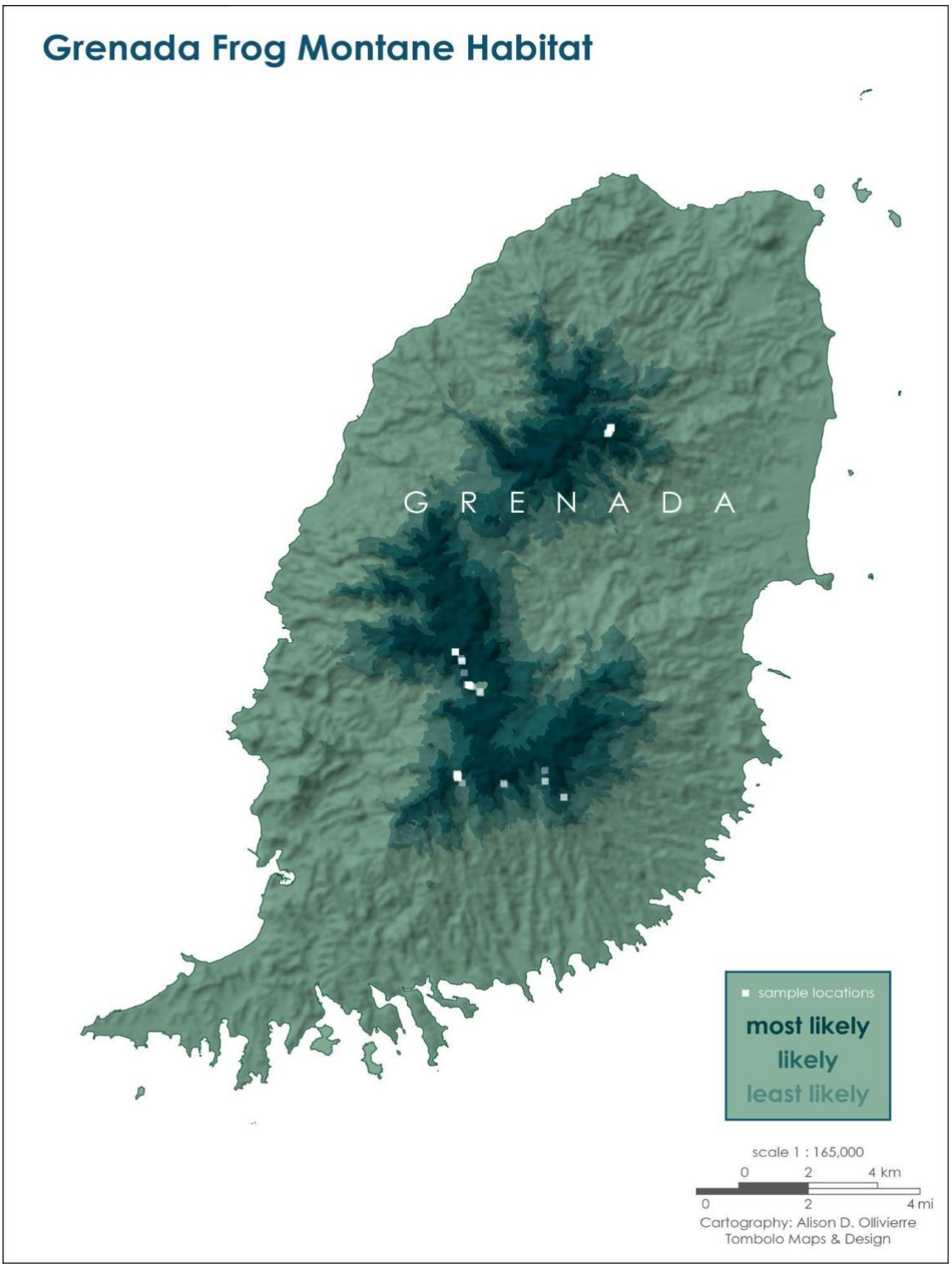

Figure F1. *Cloud and montane forest above the 300-metre elevation contour across Grenada, the only habitat the endemic Grenada Frog now occupies, with the three indicator survey sites marked: Grand Étang and Mount Kublal in St. Andrew and Les Avocats in St. David. The shaded area represents the species' estimated current range of 16 square kilometres or less, contracted from a historically wider distribution by forest loss and the upslope advance of warmer, drier conditions.*

Baseline Population Status

Baseline indices were derived from Harrison's 2004–2020 dataset across the three indicator sites, expressed as catch-per-unit-effort (frogs per hour). The values below are the per-site 95% confidence intervals, calculated from the averages and standard errors in that dataset, and serve as the reference points for future monitoring.

- **Grand Étang (St. Andrew)**: 1.29–2.31 frogs per hour (95% CI; mean 1.80 ± 0.26 SE).
- **Les Avocats (St. David)**: 1.47–3.87 frogs per hour (95% CI; mean 2.67 ± 0.61 SE).
- **Mount Kublal (St. Andrew)**: 12.08–16.16 frogs per hour (95% CI; mean 14.12 ± 1.04 SE).

These baselines document substantial site-specific variation in frog density, reflecting both ecological conditions and interannual fluctuation in detectability (Harrison & Beston 2026).

Threats and Conservation Status

The International Union for Conservation of Nature (IUCN) Red List classified the Grenada Frog as Endangered in 2011, and a 2021 reassessment upgraded the species to Critically Endangered. The species faces a confluence of threats, summarised below.

- **Invasive competition.** The introduced Lesser Antillean frog (*Eleutherodactylus johnstonei*) is adaptable, heat-tolerant, and ubiquitous, and competes directly with the endemic Grenada Frog for cover objects and oviposition sites (Harrison et al., 2011). Because male *E. johnstonei* brood the eggs, females can feed continuously and reproduce more efficiently, and island-wide trends show a minor negative correlation between the two species consistent with competitive suppression. This competition is unlikely to pose a significant threat; however, it may exacerbate population declines as other pressures intensify (Harrison & Beston, 2026; Harrison et al., 2011).
- **Habitat fragmentation, loss, and disturbance**. Between 70 and 85 per cent of Grenada's native forest cover has been lost to historical land conversion (Henderson & Powell, 2018, as cited in Harrison & Beston, 2026; Harrison et al., 2011). Hurricane Ivan in 2004 decimated closed-canopy habitat at sites such as Grand Étang and allowed non-native razor grass to invade the forest floor, producing warmer, drier conditions that favour the generalist invader over the endemic. Continued habitat fragmentation will also reduce population connectivity and gene flow on multiple scales, potentially resulting in the loss of genetic diversity and reduced fitness (Harrison & Beston, 2026; Harrison et al., 2011).
- **Climate change**. Warming and drying threaten to shrink the high-elevation refuges on which the species depends, forcing it into tighter spatial overlap and intensified competition with the invasive frog (Harrison & Beston 2026).

- **Disease**. The lethal fungal pathogen *Batrachochytrium dendrobatidis*, though not detected on Grenada among amphibians (Lownds et al., unpublished data), finds ideal conditions in the cool, moist, high-elevation habitats the Grenada Frog occupies. If detected, *Batrachochytrium dendrobatidi* presents a severe and imminent threat to the Grenada Frog (Harrison et al. 2011).

Sea Turtles

Grenada's coastal and offshore waters support five sea turtle species, with leatherbacks as the primary nesting species on mainland beaches. This section establishes baselines for all five species, drawing on nesting and in-water monitoring data compiled by Ocean Spirits Inc., spanning 2004–2024 for leatherbacks and more recent assessments for the other species.

Species, Status, and Habitats

Five species occur in Grenadian waters: the leatherback (*Dermochelys coriacea)*, hawksbill (*Eretmochelys imbricata*), green (*Chelonia mydas*), olive ridley (*Lepidochelys olivacea*), and loggerhead (*Caretta caretta*) (Eckert & Eckert 2019). Their status and use of Grenadian habitats differ markedly, as set out below.

- **Leatherback**. Globally classified as Vulnerable, while the Northwest Atlantic subpopulation is Endangered owing to steep regional declines (Eckert & Hart 2021; IUCN 2026). Leatherbacks are the dominant nesting species, favouring northern, northeastern, and southwestern beaches, with Levera Beach serving as the primary index nesting ground and a nesting season spanning March to August (Charles et al. 2023; Ocean Spirits Inc. 2023, 2024).
- **Hawksbill**. Globally classified as Critically Endangered (IUCN 2026). Hawksbills nest primarily on remote offshore islands – Isle de Caille, Isle de Ronde, and Carriacou – between May and October; mainland nesting is rare, though single nests were recorded at Levera Beach in both 2023 and 2024 (Ocean Spirits Inc. 2023, 2024).
- **Green**. Globally classified as Endangered (IUCN 2026). Green turtles nest sporadically and year-round but predominantly use Grenada's nearshore waters and offshore islands as foraging grounds (Ocean Spirits Inc. 2023).
- **Olive ridley and loggerhead.** Both are infrequent visitors (Eckert & Eckert 2019). The first recorded olive ridley nest on Levera Beach was documented in 2023, a notable ecological event, while loggerhead status in Grenada remains largely undocumented (Ocean Spirits Inc. 2023).

The nesting and foraging areas used by these species are distributed across multiple parishes and offshore islands. The map below will depict those areas once data-use authorisation is confirmed with Ocean Spirits.

Figure T1. *Nesting and foraging areas for Grenada's five sea turtle species: the Levera Beach leatherback index nesting ground on the northeast coast, where the first recorded olive ridley nest was also documented in 2023; hawksbill nesting on the offshore islands of Isle de Caille, Isle de Ronde, and Carriacou between May and October; and the nearshore and offshore green and hawksbill foraging grounds documented through in-water survey. The map will be regenerated and confirmed with Ocean Spirits Inc., subject to data-use authorisation, prior to final publication.*

Leatherback Baseline

Leatherbacks dominate Grenada's turtle nesting community, with a documented nesting season from March to August. The long-term average across 2004–2024 was 567 ± 320.8 nests per season (Ocean Spirits Inc. 2023, 2024). Recent nesting seasons fall well below that average: 193 confirmed nests at Levera Beach in 2023, declining further to 117 in 2024. Hatching success is abnormally low, averaging 25 to 40 per cent against a global average of 50 to 55 per cent (Charles et al. 2023). Levera Beach is both the primary index beach and the source of the nesting baseline reported here.

Other Species Baselines

In-water surveys conducted by Ocean Spirits in 2023 documented 37 hawksbill individuals and 51 green turtle individuals at foraging sites across multiple life stages. These in-water counts provide the baseline for the foraging populations of the two species. Hawksbill nesting remains concentrated on the offshore islands, while green turtles are encountered mainly as foragers rather than nesters.

Threats in Grenada

Sea turtles in Grenada face a combination of direct harvest, habitat loss, and disease, summarised below.

- **Hunting and poaching.** While leatherbacks and their eggs are legally protected, Grenada maintains an open legal hunting season for other sea turtle species from September through March, and enforcement of protective laws is inadequate, leaving these species vulnerable to targeted poaching and illegal egg harvesting (WIDECAST 2023; Ocean Spirits Inc. 2023).
- **Coastal erosion and climate events**. Nesting habitat is shrinking through erosion and severe weather. In 2024, Hurricane Beryl caused widespread beach displacement and storm surge, terminating the nesting season early and destroying incubating nests (Ocean Spirits Inc. 2024).
- **Disease and hatching failure**. The low hatching success of Grenadian leatherbacks is exacerbated by microbial growth in the egg chamber and bacterial bronchopneumonia in hatchlings (Charles et al. 2023). In 2020, Grenada recorded its first case of Chelonid alphaherpesvirus 5 (ChHV5)-associated fibropapillomatosis in a green turtle (James et al. 2021), and zoonotic pathogens such as *Salmonella enterica* have been identified in local turtle populations, presenting public health risks (Veterinary World 2021).

Regional Context

Grenada's nesting community is part of the Northwest Atlantic subpopulation, which is in crisis. The Guianas and Trinidad, once the largest leatherback rookeries in the hemisphere, have experienced catastrophic declines, with French Guiana recording a 99 per cent fall in leatherback nesting over two decades (Eckert & Hart 2021). At the regional level, bycatch from nearshore artisanal gillnets and offshore longline fisheries is the primary driver of adult leatherback mortality (Eckert & Hart 2021). Sea-level rise and coastal development continue to erode nesting beaches, while rising temperatures are producing extreme female-biased hatchling sex ratios and reducing nest viability across the Caribbean (Eckert & Hart 2021).

Small Indian Mongoose (Urva auropunctata)

The small Indian mongoose is an invasive predator that has become ubiquitous across Grenada since its introduction in the nineteenth century. This section establishes its introduction history, ecology, distribution, and the threats it poses to native fauna and public health.

History of Introduction

The small Indian mongoose (*Urva auropunctata*, formerly *Herpestes auropunctatus* or *Herpestes javanicus*) is native to a region spanning from Iraq to Myanmar (Louppe et al. 2020). Its global spread began in the late nineteenth and early twentieth centuries, driven mainly by agricultural interests seeking biological control of rats in sugar cane fields and of venomous snakes (Barun et al. 2011; Louppe et al. 2020). The first West Indian introduction occurred in Trinidad around 1870, followed by Jamaica in 1872, and Jamaica became the source for many subsequent Caribbean introductions (Horst et al. 2001). Between 1876 and 1879, a group of 14 mongooses from Jamaica was introduced to Grenada. The animals proved largely ineffective at controlling rats and instead became a highly invasive species in their own right (GISD 2026; Zieger et al. 2014).

Ecology, Distribution, and Density

The small Indian mongoose is a highly adaptable, entirely diurnal predator (Barun et al. 2011). Although capable of swimming and climbing, it rarely does so, generally avoiding water and reducing activity during rain, and it prefers dry natural areas while exploiting wet areas when densities are high (GISD 2026). This flexibility allows it to occupy open landscapes, scrubland, dry and humid forest, coastal habitats and mangroves, and human-altered habitats including agricultural, peri-urban, and urban areas (Louppe et al. 2020; GISD 2026). On Grenada, mongoose densities are exceptionally high, averaging 6 to 6.6 animals per hectare, and the island is estimated to support approximately 200,000 individuals (Horst et al. 2001; Zieger et al. 2014). Individuals maintain small home ranges of 2.2 to 4.2 hectares, though they may travel up to two kilometres, particularly when infected with rabies (Barun et al. 2011; Zieger et al. 2014).

Camera-trap prevalence monitoring recorded 85 per cent occupancy at Mount Hartman and 22 per cent at Perseverance in 2025, reflecting site-specific differences in habitat suitability. A 2026 camera trap deployment modeled mongoose detection probability by site, finding a similar pattern, with higher detection at Mount Hartman than at Perseverance, though confidence intervals for the two sites overlap given the short rotation length of individual deployments (Figure M1).

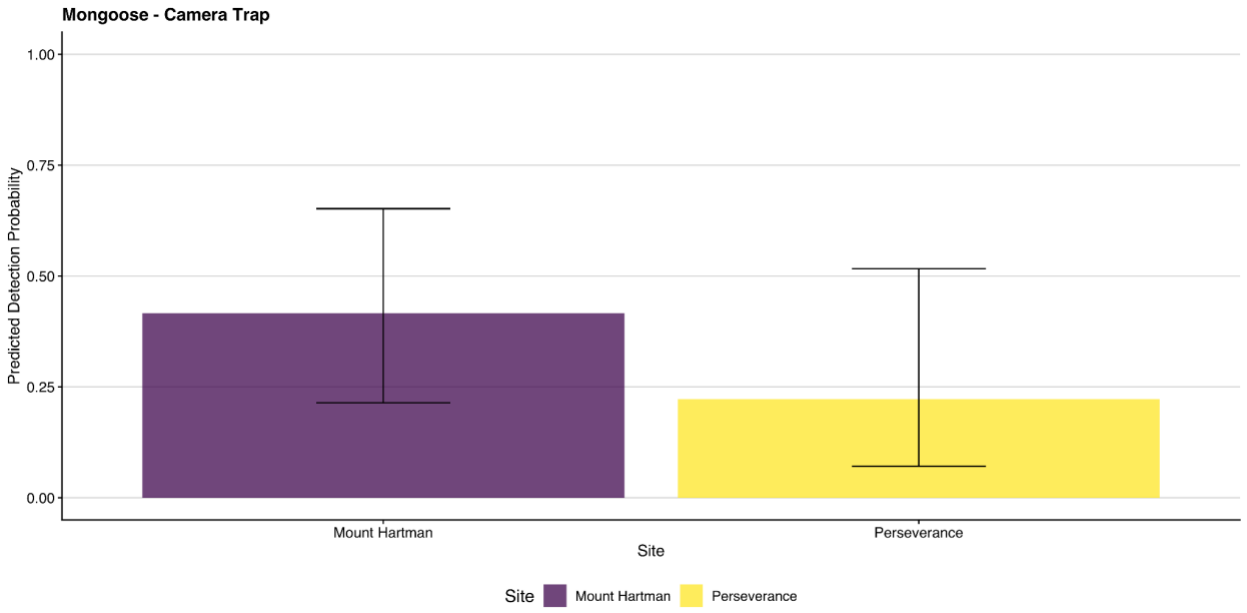

Figure M1. *Predicted mongoose detection probability by site from 2026 camera trap deployments at Mount Hartman and Perseverance. Confidence intervals overlap given the short rotation length of individual deployments.*

Predicted mongoose distribution across Grenada was mapped using the national land use and land cover layer produced under the CHARIM (Caribbean Handbook on Risk Information Management) project, generated by the British Geological Survey through object-oriented classification of high-resolution satellite imagery. The habitat types described above, associated with higher mongoose occurrence, were flagged on this layer to provide a spatial baseline against which future camera-trap and control effort can be prioritised (Figure M2).

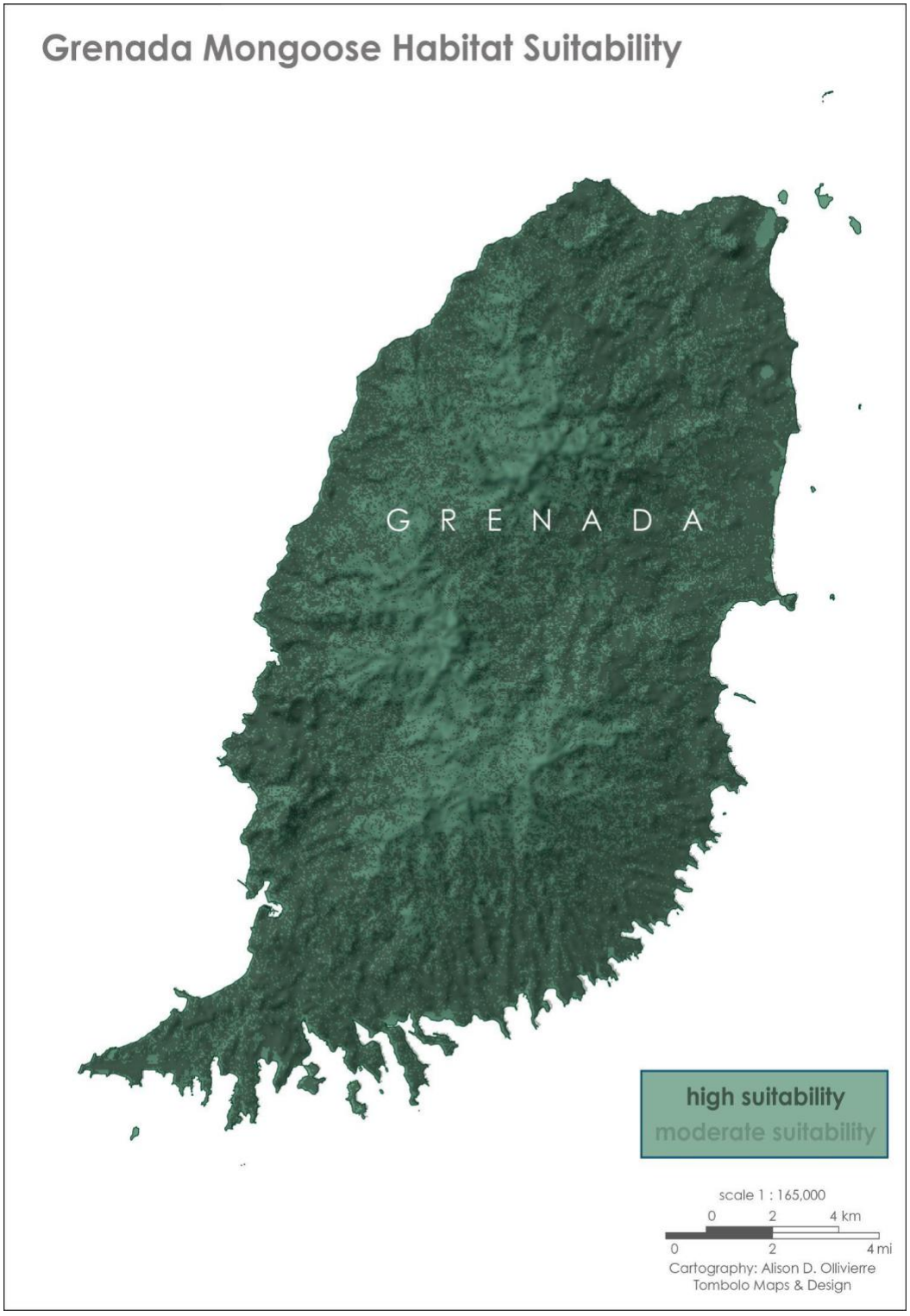

Figure M2. *Land use and land cover across Grenada (CHARIM project, British Geological Survey), with the habitat types associated with higher small Indian mongoose occurrence flagged: open areas, dry and humid forest, agricultural land, peri-urban land, and coastal scrub. The map provides spatial context for the 2025 camera-trap prevalence baselines of 85 per cent at Mount Hartman and 22 per cent at Perseverance, and for the island-wide density estimate of 6 to 6.6 animals per hectare.*

Diet and Predation

Mongooses are opportunistic, generalist carnivores, a trait underpinning their success as invaders (GISD 2026; Horst et al. 2001). Their diet shifts with location and season and includes small vertebrates – native mammals, birds, reptiles, and amphibians – as well as bird and reptile eggs, invertebrates, plant material, fruit, seeds, and human waste (Louppe et al. 2020; GISD 2026). Some insular populations rely largely on insects or fruit for parts of the year (Horst et al. 2001; GISD 2026).

Threats to Native Fauna and Public Health

Because they are highly effective predators, mongooses pose a severe threat to native biodiversity, particularly on islands where native species evolved without mammalian predators and lack natural defences (Global Invasive Species Database [GISD], 2026). The species is recognised as one of the world's 100 worst invasive species and is linked to the decline, extirpation, and extinction of native mammals, birds, reptiles, and amphibians worldwide (Barun et al., 2011; Zieger et al., 2014). For example, mongooses are considered responsible for the extinction of the barred-wing rail in Fiji and the drastic decline of the Jamaica petrel, and they have severe negative effects on the endangered Amami rabbit in Japan and the pink pigeon in Mauritius (GISD, 2026). Because of this severe threat, intensive trapping operations are currently relied upon to protect other highly vulnerable insular species, such as the critically endangered Puerto Rican parrot and the Jamaican iguana (Barun et al., 2011).

In Grenada specifically, mongooses prey on the eggs of the Critically Endangered hawksbill turtle in fragmented beach habitats, significantly hindering breeding success where trapping is not actively enforced (GISD, 2026). Furthermore, recent camera-trap monitoring reveals that mongooses are highly prevalent across the remaining restricted habitats of the Critically Endangered Grenada Dove (*Leptotila wellsi*); because these native doves frequently forage on the forest floor, the high prevalence of mongooses is likely already impacting their population and underscores an urgent need for targeted predator control (Peters & Geary, 2025). Beyond native fauna, the mongoose is also the primary reservoir of rabies in Grenada, with spillover into domestic animals and a severe transmission risk to humans through bite exposure (Milloway, 2026; Zieger et al., 2014).

Population Management

In response to the threats outlined above, mongoose control is being carried out both within Grenada Dove habitat and at a wider set of priority sites across the island. Mount Hartman, the core Grenada Dove habitat, is a direct control site addressing predation pressure on the species. River Antoine, on the other side of the island and outside Grenada Dove range, reflects the

broader island-wide control effort, coordinated in the field using standardised KoboToolbox monitoring forms completed at the time of each session.

Between June and July 2026, three culling events were carried out – one at River Antoine and two at Mount Hartman, both dry forest habitat, with the River Antoine site also spanning adjacent agricultural land. Live cage traps baited with chicken were used at all three events, with fish added as a secondary bait at the second Mount Hartman session. Weather conditions were overcast at River Antoine and dry/clear for both Mount Hartman sessions.

At River Antoine, 58 traps were deployed in a single session, with none requiring resetting. At Mount Hartman, 48 traps were deployed per session; all traps were reset after the first session, while none required resetting after the second. Across the three events, 36 mongooses were removed. Catch composition by site and sex is shown in Figure M3.

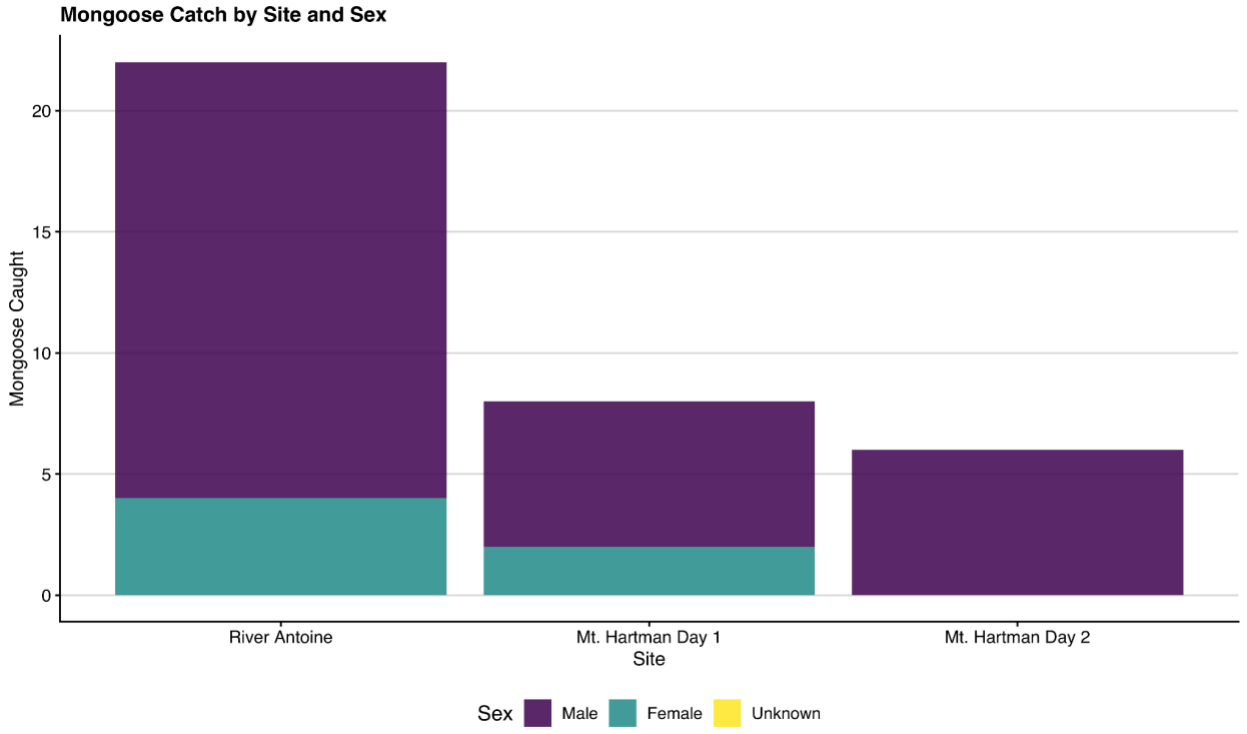

Figure M3. *Mongoose caught by site and sex across three culling events, June–July 2026 (River Antoine, Mount Hartman Day 1, Mount Hartman Day 2). Field data collected via KoboToolbox monitoring forms completed during trapping sessions.*

Non-target catch was recorded at two of the three events. At River Antoine, dogs disturbed four traps during the session, and opossum (manicou) were caught alongside the target species. At the second Mount Hartman session, one feral cat and several opossum were also caught. Non-target catch is not reflected in the mongoose totals in Figure M3, but is noted here as a factor relevant to trap placement and field conditions going forward.

These culling events followed community mongoose control training delivered earlier in the year, and represent an initial pilot to compare catch outcomes across sites with differing habitat and predator pressure. Catch volume and composition are expected to vary by location and habitat type; continued monitoring across additional sites and sessions will clarify whether these early differences hold as control efforts expand.

Chytridiomycosis (*Batrachochytrium dendrobatidis*)

Chytridiomycosis is a fungal disease of amphibians that has caused unprecedented global biodiversity loss. This section documents the disease, its ecology and infection dynamics, its confirmed presence on Grenada, and the vulnerability of the endemic Grenada Frog.

The Pathogen and Its Global Spread

Chytridiomycosis is caused by the waterborne fungus *Batrachochytrium dendrobatidis* (Bd), which has driven the most significant disease-caused loss of biodiversity in recorded history, contributing to the decline or extinction of hundreds of amphibian species (Cornell Wildlife Health Lab 2026). The fungus is thought to have originated on the Korean peninsula and to have spread globally in the late 1800s and early 1900s (Cornell Wildlife Health Lab 2026). In the Caribbean, it was first detected in 2002 on Dominica, where it reduced the endemic mountain chicken frog (*Leptodactylus fallax*) by at least 80 per cent within two years, and it has also been documented in Puerto Rico (Wren 2008; Darwin Initiative 2006). Bd is spread mainly through human activity, including the movement of contaminated water, soil, footwear, and equipment, and stowaway amphibians in agricultural shipments (Darwin Initiative 2006).

Infection Dynamics and Habitat Preferences

As a fungal pathogen, Bd disperses motile zoospores into water in search of hosts and infects the keratin layer of amphibian skin (Cornell Wildlife Health Lab 2026). Infection thickens the skin and impairs oxygen exchange, hydration, thermoregulation, and nutrient intake; affected animals show excessive skin shedding, lethargy, reddened skin, convulsions, and abnormal feeding before death. The fungus thrives in moist environments and grows best between 17 and 25 degrees Celsius, resulting in outbreaks that occur most frequently during cooler months and at higher montane elevations, where zoospores can persist for weeks in water or moist soil (Cornell Wildlife Health Lab 2026). Several species, including the American bullfrog and the African clawed frog, act as resistant carriers that can spread zoospores to vulnerable native fauna (Cornell Wildlife Health Lab 2026).

Status and Vulnerability in Grenada

Grenada supports five amphibian species – the endemic Grenada Frog (*Pristimantis euphronides*), the introduced Johnstone's whistling frog (*Eleutherodactylus johnstonei*), the native ditch frog (*Leptodactylus validus*), the introduced cane toad (*Rhinella marina*), and the introduced greenhouse frog (*Eleutherodactylus planirostris*) (Germano et al. 2003; Harrison et al. 2011). Because Bd thrives in cool, moist, high-elevation conditions, the montane habitat of the endemic Grenada Frog makes it ecologically highly susceptible to outbreak.

An island-wide survey conducted in 2026 by Shelley Lownds and Dr. Sophie Moittie of the St. George's University School of Veterinary Medicine sampled 211 individuals across five species at

36 locations island-wide and found no positive detections for Bd across any species or site (Lownds et al., unpublished data). Weak positives identified by PCR and qPCR were sent for sequencing and confirmed negative. Rhinovirus samples were also collected and are awaiting analysis. To date, Bd has not been detected on Grenada; continued surveillance remains warranted given the ecological susceptibility of the endemic Grenada Frog, and any future positive detection should be treated as an immediate conservation alert.

References

Barun, A., Hanson, C. C., Campbell, K. J., & Simberloff, D. (2011). A review of small Indian mongoose management and eradications on islands. In C. R. Veitch, M. N. Clout, & D. R. Towns (Eds.), Island invasives: Eradication and management (pp. 17–25). IUCN.

Blockstein, D. E. (1991). Population declines of the endangered endemic birds on Grenada, West Indies. Bird Conservation International, 1, 83–91.

Blockstein, D. E., & Hardy, J. W. (1989). The Grenada Dove (*Leptotila wellsi*) is a distinct species. The Auk, 106, 339–340.

Bolton, N. M., van Oosterhout, C., Collar, N. J., & Bell, D. J. (2016). Population constraints on the Grenada Dove Leptotila wellsi: preliminary findings and proposals from south-west Grenada. Bird Conservation International, 26, 205–213.

Charles, K. E., Morrall, C. E., Edwards, J. J., Carter, K. D., Afema, J. A., Butler, B. P., & Marancik, D. P. (2023). Environmental and nesting variables associated with Atlantic leatherback sea turtle (Dermochelys coriacea) embryonic and hatching success rates in Grenada, West Indies. Animals, 13(4), 685.

Cornell Wildlife Health Lab. (2026). Chytridiomycosis. NYS Wildlife Health Program.

Darwin Initiative. (2006). Draft chytridiomycosis management plan for the Lesser Antilles region.

Eckert, K. L., & Eckert, A. E. (2019). An atlas of sea turtle nesting habitat for the Wider Caribbean Region. WIDECAST Technical Report No. 19.

Eckert, K. L., & Hart, K. (2021). Threat assessment, Northwest Atlantic leatherback sea turtle subpopulation. WIDECAST.

Germano, J. M., Sander, J. M., Henderson, R. W., & Powell, R. (2003). Herpetofaunal communities in Grenada: A comparison of altered sites, with an annotated checklist of Grenadian amphibians and reptiles. Caribbean Journal of Science, 39(1), 68–76.

Global Invasive Species Database (GISD). (2026). Species profile: Herpestes javanicus. IUCN SSC Invasive Species Specialist Group.

Harrison, B., & Beston, J. (2026). Relationship between endemic and invasive frogs on Grenada. Ecology and Evolution.

Harrison, B., Berg, C. S., & Henderson, R. W. (2011). The Grenada frog (Pristimantis euphronides): an endemic species in decline and the combined effects of habitat loss, competition, and chytridiomycosis. IRCF Reptiles & Amphibians, 18(2), 67–76.

Horst, G. R., Hoagland, D. B., & Kilpatrick, C. W. (2001). The mongoose in the West Indies: The biogeography and population biology of an introduced species. In C. A. Woods & F. E.

Sergile (Eds.), Biogeography of the West Indies: Patterns and perspectives (2nd ed., pp. 407–422). CRC Press.

IUCN. (2026). The IUCN Red List of Threatened Species. Version 2026-1. <https://www.iucnredlist.org> ISSN 2307-8235>

James, A., Page-Karjian, A., Charles, K. E., Edwards, J., Gregory, C. R., Cheetham, S., Butler, B. P., & Marancik, D. P. (2021). Chelonid alphaherpesvirus 5 prevalence and first confirmed case of sea turtle fibropapillomatosis in Grenada, West Indies. Animals, 11(5), 1490.

Lawrence, G. N. (1884). Characters of a new species of pigeon of the genus Engyptila, from the island of Grenada, West Indies. The Auk, 1(2), 180–181.

Louppe, V., Leroy, B., Herrel, A., & Veron, G. (2020). The globally invasive small Indian mongoose Urva auropunctata is likely to spread with climate change. Scientific Reports, 10(1), 7461.

Milloway, O. (2026). Invasive Indian mongooses bounce back after removal. The Wildlife Society.

Ocean Spirits Inc. (2023). Ocean Spirits Inc. 2023 summary report.

Ocean Spirits Inc. (2024). Ocean Spirits Inc. 2024 summary report.

Peters, K., & Geary, M. (2025). *Camera traps for nest monitoring of a Critically Endangered Columbiform: the Grenada Dove Leptotila wellsi*. University of Chester.

Peters, C., Geary, M., Hosie, C., Nelson, H., Rusk, B., & Muir, A. (2023). Non-invasive sampling reveals low mitochondrial genetic diversity for an island endemic species: the critically endangered Grenada Dove Leptotila wellsi. Ecology and Evolution, 13(11), e10767.

Peters, C., Geary, M., Nelson, H. P., Rusk, B. L., Von Hardenberg, A., & Muir, A. (2022). Phylogenetic placement and life history trait imputation for Grenada Dove Leptotila wellsi. Bird Conservation International, 33, 1–11.

Peters, C., Muir, A., Hosie, C., Nelson, H., & Geary, M. (2025). Assessing threats and conservation action using population viability analysis for the critically endangered Grenada Dove Leptotila wellsi. Journal for Nature Conservation, 89, 127052.

Rivera-Milán, F. F., Bertuol, P., Simal, F., & Rusk, B. L. (2015). Distance sampling survey and abundance estimation of the critically endangered Grenada Dove (Leptotila wellsi). The Condor: Ornithological Applications, 117(1), 87–93.

Rosenberg, J. (2018). Transnational advocacy and the politics of sustainable development in a small island developing state: an uncertain future for the Grenada Dove. Journal of Environment & Development, 27(2), 236–261.

Rusk, B. L. (2017). Long-term population monitoring of the critically endangered Grenada Dove (Leptotila wellsi) on Grenada, West Indies. Journal of Caribbean Ornithology, 30(1), 49–56.

Twyman, W. D., & Hayslette, S. E. (2007). Grenada Dove biology. Grenada Dry Forest Biodiversity Conservation Project.

Veterinary World. (2021). Salmonella enterica in marine turtles in Grenada. Veterinary World, 14, 222–228.

WIDECAST. (2023). NWA leatherback RAP meeting report: regional implementation and adaptation workshop.

Wren, S. (2008). Conservation of Caribbean amphibians. EDGE of Existence.

Zieger, U., Marston, D. A., Sharma, R., Chikweto, A., Tiwari, K., Sayyid, M., Louison, B., Goharriz, H., Voller, K., Breed, A. C., Werling, D., Fooks, A. R., & Horton, D. L. (2014). The phylogeography of rabies in Grenada, West Indies, and implications for control. PLOS Neglected Tropical Diseases, 8(10), e3251.