



Review of Environmental Impact Assessment for Grenada National Resort

Grenada Land Actors

info@grenadaland.org

<https://grenadaland.org/>

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INTRODUCTION

This document is a comprehensive review of the Environmental Impact Assessment (EIA) for the Grenada National Resort at Levera by the Grenada Land Actors (GLA). We highlight that the impact assessment process in Grenada has major gaps in planning legislation and raise questions about the integrity of the EIA process, as well as the qualifications of the persons conducting them. The EIA submitted for the new Levera project contains numerous errors, including the use of old and irrelevant data, a lack of proper data collection, and the absence of real mitigation measures. The flaws in the EIA also extend to the attention paid to local laws, legislation, and policy, as well as the disregard for international obligations such as the RAMSAR Convention on Wetlands. The EIA pays little attention to important marine and terrestrial wildlife and their habitats and the fact that Levera is designated by Grenada’s government to become a Marine Protected Area (MPA). Much of the biodiversity data collection is unclear and insufficient, including missing data and confusion over the status of bird and plant species present in Levera.

In brief, we show that in this review, the EIA was inadequate, at best, and needs to be rectified before further destruction occurs in this important ecosystem. It is also imperative that proper regulations and guidelines be put in place to ensure that the EIA process is transparent and effective in protecting the environment and the rights of local communities going forward.

BACKGROUND

Short History of Development at Levera

Since the 1960s, the area known as “Levera” located in the parish of St. Patricks in Grenada has been divided into commercial and public areas, with large sections reserved (especially to the west of the Pond) for natural wilderness. In 1987, the first management plan was put in place and the area was referred to as Levera National Park. However, within ten years, it was sold to developers for luxury projects, including a resort, golf course, and boutique hotel. Each of these projects caused

environmental destruction and ultimately failed. In 2020, Singapore Heng Sheng (Grenada) Development PTE LTD. began the latest attempt to develop the area. They began the development by constructing workers' housing and road expansion in the same year. The following year, the Environmental Impact Assessment was completed, though public access to this document from the Physical Planning Unit (PPU) was delayed to the end of 2022, finally being released under a new government administration.

Based on the landscape plans, there will be extensive removal of vegetation throughout the site (to accommodate new roads, hotel, and golf course), but most extensively in the littoral woodlands. The plans also suggest that there will be infrastructure placed within the wetland and the hydrology will be modified to accommodate water sporting activities. There are three, 16-story buildings proposed to house guests and a jetty to house oncoming boat traffic.

Legal Proceedings and EIA issues

Grenada Land Actors Inc. (GLA) has initiated legal proceedings against the Physical Planning and Development Authority (PDA) in Grenada as it relates to three mega-resorts in Grenada – happening in Levera, Mt. Hartman, and La Sagesse. One of the main issues in the case is how the Environmental Impact Assessment (EIA) process has been developed and implemented at each site.

As it pertains to the Levera development, otherwise known as the “Grenada National Resort,” currently being built by the Singapore Heng Sheng (Grenada) Development PTE LTD company; GLA was drawn to the case after learning that development had been allowed to start before the EIA for the project had even been completed. Workers' housing was constructed and clearing of land and vegetation was allowed to take place. Levera is one of the most environmentally sensitive places in Grenada, the home of the Leatherback turtles, which tourists have come to see for decades and Grenada's only site protected internationally under the RAMSAR convention for the protection of wetlands. At present, large swathes of land and forest are being destroyed at Levera, near the beach, to construct the Golf Course which forms a large component of the Grenada National Resort. GLA members joined a site visit at Levera led by the Physical Planning Unit in September of 2020, where only plans for the workers' housing were revealed. This housing was being constructed in very close proximity to the main pond at Levera with little details provided on the management of sewage and wastewater. GLA then made attempts to engage the EIA practitioners, Niles and



Associates, in order to raise important concerns about the impacts of the development. GLA compiled a report detailing issues surrounding natural and cultural heritage, coastal erosion, biodiversity conservation (including marine and land-based species) and included recommendations to minimize environmental damage to the Levera ecosystem. These recommendations were ignored. Following this, GLA members attended a public consultation held by the Developer and Niles and Associates in April 2021 at St. Patricks. At this public consultation, it was revealed that the RAMSAR boundaries had been altered to accommodate the development, based on an agreement with the developers and government with no public consultations or any media releases to announce the change in the country's only RAMSAR-protected site.

GLA began public legal proceedings in March of 2021 to highlight the failings in the EIA process affecting these incredibly sensitive sites across Grenada. At the time that proceedings began, the EIA for the Levera project had still not been completed. In December 2022, GLA requested the completed EIA from the new Head of the Physical Planning and Development Authority. This was provided on the 9th of December of 2022. This document is a compilation of the comments that GLA members and collaborators have compiled after reviewing the EIA for the Grenada National Resort at Levera.

REVIEW OF ENVIRONMENTAL IMPACT ASSESSMENT FOR THE GRENADA NATIONAL RESORT PROJECT, LEVERA, ST. PATRICKS

Overall EIA Process and Gaps in Planning Legislation

- **The Integrity of the EIA Process:** In the background section of this EIA, Niles and Associates describe the purpose of this EIA as “to ensure the approval of the Project by the Physical Planning and Department Control Authority”. This stated objective is quite contrary to best-practice understandings of the roles of EIAs in the development process. Under the US Environmental Policy Act (NEPA), established in 1970 and the first formal EIA system, EIAs are described as decision tools used to identify and evaluate the likely environmental impacts of a proposed development project.¹ Contrary to what is stated by Grenada National Resort EIA authors, it is not to “ensure approval” but meant to: 1) help decision makers understand the issues that may arise from a proposed project; 2) propose feasible alternatives or mitigation strategies to avoid adverse impacts; and 3) enhance public participation.²
- **Planning Regulations:** The 2016 Physical Planning and Developmental Control Act lacks sufficient regulations to guide EIAs (this is one aspect of GLA’s legal case); thus, there are no clear: 1) TORs, or 2) language speaking to the qualifications of persons conducting EIAs in Grenada. Particularly with projects of unprecedented size like the Grenada National Resort– Billions of dollars – we see the potential for more disastrous environmental damage than ever before, and the associated EIAs do little to meet their true objective. Missing from this EIA is the TOR, so it is not clear whether the authors met the conditions set by the PPU.
- **Granting Permission from Outline Planning Consent/Phased Development:** When the PPU granted permission to the developers to construct workers’ housing and expand roads: 1) full planning consent was not yet awarded, pending the EIA; and 2) the project was split into

¹ Cashmore, M. (2004). The role of science in environmental impact assessment: process and procedure versus purpose in the development of theory. *Environmental impact assessment review*, 24(4), 403-426.

² Center, O. E. C. (2000). Environmental impact assessment for international cooperation: furthering the understanding of environment impact assessment systems for experts engaged in international cooperation activities. Environment Agency, Government of Japan, Tokyo.

phases, seemingly to avoid waiting on full planning consent to start construction. Based on the 2016 Act, approval in principle does not give permission to commence construction, contrary to the actions of the PPU. Also, while the golf course, workers' housing, road expansion, jetty and hotel were all part of the same development; by using a phased approach, the PPU was inherently allowing the developers to bypass the more rigorous demands for such a large-scale project. Contrary to best practices in development, phased developments to avoid comprehensive EIAs is a tactic used by developers worldwide, and it is the responsibility of the PPU to ensure these attempts are not successful.³

- **Inadequate Mitigation measures and Lack of Enforcement of Mitigation:** Though the mitigation strategies proposed in this EIA are inadequate, and the EIA lacked any proposed alternatives, given the history of PPU's actions (e.g., at La Sagesse), it is quite likely that the conditions of the full approval did not list the mitigation strategies that the developers should adopt, and even if they did, enforcement is unlikely.

Legislation & Policy and International Obligations

- **No attention to local legislation, and policy:** There is ongoing clear cutting of coastal vegetation at Levera as part of this development, contrary to the Integrated Coastal Zone Management (ICZM) Act of 2019. This Act is not mentioned anywhere in the EIA, instead the older Beach Protection Act of 1967 is referenced, which is no longer in force - sand mining continues to be a major challenge around the island. The newer ICZM Act has provisions for coastal management plans, enforces sand mining activities and also protects coastal vegetation. Grenada has no overarching environmental legislation, despite this the Ministry of Environment is not mentioned in this EIA, despite the new ICZM Act falling under their purview. There is no mention of the Birds and Other Wildlife (Protection) Act of 1957, amended in 1990 and no reference to the Museum Act of 2017. The older Abatement of Litter Act from 1973 is mentioned, but not the revised 2015 Act, which has faced multiple

³ Enríquez-de-Salamanca, Á. (2016). Project splitting in environmental impact assessment. *Impact assessment and project appraisal*, 34(2), 152-159.

problems being implemented since its passage. There is no reference to the National Land Policy and also the National Water Policy, both of which are supposed to have recent Cabinet approval.

- **No attention paid to Archaeology:** Though 100% of the persons surveyed in the EIA were “concerned about archaeology”, no assessments were done under this EIA. Given the known unearthing of artifacts under prior projects, we would expect that an assessment was done - in keeping with the Museum Act of 2017.
- **Change in RAMSAR Boundary:** Based on the maps and ‘MoU’ provided in this EIA, the RAMSAR site has been cut in half to accommodate the current project, and longer protects the whole beach or the coastal vegetation bordering it. No consultation with local stakeholders was done to change the extent of the protected area and the plans suggest that there will be development activities within the RAMSAR site as well. Absent from the EIA is signed documentation between the Government and Developer on the new boundaries of the RAMSAR site.
- **No consideration of ongoing efforts to manage and protect the site:** Levera was treated as a National Park for many years – it is still referred to as a National Park by GTA and Tourism on current websites. Even under planning application documents, Levera is listed as an example of a National Park (along with Grand Etang). Is there a legitimate expectation for the area to be gazetted as a National Park? Now, it appears that the developer will be creating the National Park themselves, using their own boundaries that accommodate their oversized resort. Recently, in 2018, there was a management plan developed for what should have become the Levera Marine Protected Area, which incorporated the RAMSAR boundaries.⁴ That management plan and the studies that went into it are barely mentioned in this EIA.
- **Cultural and Tourism Assets:** The popular “Welcome Stone” at the top of Levera Piton also appears to be part of the development, based on the public designs. Future access to this site remains unclear. Sugar Loaf Island is also incorporated into the plans for this development

⁴ Grenada Coral Reef Foundation (2018). Management Plan for the Levera Marine Protected Area 2019-2023. Ridge to Reef Project. 38pp

(despite also being a part of the original RAMSAR site) and any impacts on this offshore island have not been mentioned in this EIA.

Coastal Processes & Livelihoods

- **Livelihoods:** Missing from the EIA is a thorough discussion on livelihoods that will be impacted by this development - including turtle tours and fishing. The EIA lacks any information how many fishermen use the area; how important this area is to their livelihoods or what mitigation strategies/feasible alternatives can be considered to ensure there are no adverse impacts. Even the ongoing work by the St Patrick's Environmental and Community Tourism Organisation (SPECTO) is not discussed - or how this development will impact them.
- **Research:** Ocean Spirits Inc. has been conducting turtle research on this beach since the 1990s, and this EIA makes no mention of this to discuss how this research (or the turtles themselves) will be impacted by the project. Again, the authors provide no alternatives - or present how this project will mitigate any effects on the turtles and other important wildlife at Levera, no discussion with those who have livelihoods linked with these species – SPECTO, Ocean Spirits, local fishermen etc.
- **Jetty & Coastal Processes:** The current development at Levera has plans for a jetty at Levera Beach – possible dredging will have to happen to accommodate this. No details are provided of the expected impacts of this construction on the nearshore areas and beach. Recent studies, including a Sediment Transport and Shoreline Change Study done for Grenada in 2019 document how dynamic the Levera coastline is throughout the year, making it unlikely that such a structure could be built without drastically impacting the beach.
- **No use of recent GIS data, including LiDAR:** The recent high resolution LiDAR data (circa 2017) could have been used in hydrology modelling, mostly to model water flows/accumulation with the Levera Watershed. With this data, the authors of the EIA could have reliably shown how this project could affect surface runoff and groundwater, which could be used to advise mitigation strategies and/or feasible alternatives to avoid adverse impacts. Bathymetric LiDAR, taken by the UKHO for Grenada in 2016 could have been used to properly document the benthic conditions present at Levera. Habitat mapping based on

this dataset was also done for Grenada, which is also absent. This combined with other open data sources could have provided a much better picture of the marine biodiversity at Levera.

Terrestrial & Marine Biodiversity

Though not mentioned in this EIA, Levera is carded to be a Marine Protected Area and a Management Plan was developed in 2018.⁵ Also, as mentioned, even on current Planning Documents, this area is listed as a National Park. One major reason, we argue, that Levera already has a Ramsar designation and that many advocate for its formal protection is because it has significant ecological value to Grenada. Though the EIA does briefly mention that it is a unique area, in terms of its ecology, it glosses over the numerous impacts this large-scale hotel will have on the natural environment and lacks any useful mitigation strategies to minimize these impacts. Generally, this EIA presents unsourced data without using best practices to collect these data. Readers are left to make an educated guess on data sources and the EIA makes no attempt to highlight how these biotas will be affected by the project, which is a major reason to conduct an EIA.

Data Collection

Quite unclear is how these data were collected or when. A simple species inventory is presented and no information on relative abundance (for biotas). Also absent is reference levels for the two water quality parameters presented.

- **Amphibians:** This taxon was not listed in the EIA.
- **Birds:** We are presented with an inventory, though there is extensive abundance information on eBird for both ponds and the beach (as early as 1991). There seems to be a general confusion on extinct versus extirpated vs extant (i.e., listing the Scarlet Ibis as extinct). Also, the groupings of birds by resident and migratory status is error-ridden. Moreover, some birds are listed under the wrong guild (e.g., Osprey under seabirds). Even though the inventory is simply not sufficient, the authors do not clarify where in Levera these species are found. Another data source for birds (that was not a simple inventory)

⁵ Grenada Coral Reef Foundation (2018). Management Plan for the Levera Marine Protected Area 2019-2023. Ridge to Reef Project. 38pp

would be an assessment done in 2018 (point count) as part of the Management Plan for Levera Marine Managed Area, under Annex 2.⁶

- **Plants:** Missing are data on tree height, canopy width, and DBH - all of which would help in underpinning that the mangroves here are older growth. We can presume that given the detail presented, someone did a walkthrough of the area and identified the dominant species (though no details are provided on when this data collection happened).
- **Mammals:** While the source of the inventory is unclear, it could have benefited from some camera traps - particularly because encroachment by this development could have serious impacts for nesting birds (mammals are the leading cause of nesting failure for birds). It is also not clear how the mammals listed were surveyed.
- **Reptiles:** As with the other taxa, we are presented with an inventory. Sea turtles, while also reptiles, are listed by family. And while Levera beach is widely known as the most important Leatherback nesting area in Grenada, this is not mentioned. As with the other taxa, relative abundance would have been a better measure of prevalence.
- **Water quality:** There are several issues with the water quality information presented. First, it is not clear when these data were collected - for instance, whether it was after a major rainfall event or not. Second, the results are from one sample and cannot be used to ascertain “typical” conditions of the site. Third, while we can assume the sample was collected at the larger pond, one sample for such a large area is not sufficient and we lack information about the smaller pond. Fourth, we are only provided with two parameters (i.e., Fecal Coliform and Enterococci) and neither of these are often used to understand impacts of water quality for birds, plants, or fish; more useful measures could have included , DO, pH, electrical conductivity/salinity, turbidity, etc..⁷ Regardless, based on a 2018 assessment, the water quality in the area was reported as poor based using the two

⁶ Grenada Coral Reef Foundation (2018). Terrestrial Habitat Assessment: Levera Marine Protected Area. Assessment Report. Ridge to Reef Project. 23pp

⁷ Kraft, A. J., Robinson, D. T., Evans, I. S., & Rooney, R. C. (2019). Concordance in wetland physicochemical conditions, vegetation, and surrounding land cover is robust to data extraction approach. Plos one, 14(5), e0216343.

parameters reported in this EIA - the water samples were collected at 6 locations and fecal coliform levels were exceedingly poor at four locations in the bay.⁸

- **Marine Biotas:** Under the Marine Managed Area Plan for Levera in 2018, the Grenada Coral Reef Foundation conducted a marine assessment using an internationally recognized method (Atlantic and Gulf Rapid Reef Assessment [AGRRA]) at representative sites in each coral type - patch, fringing, and bank.⁹ They reported biological information on Motile Invertebrates, Benthic Composition, Fish, and Coral. Given the extensive study done in 2018, and the reporting on where the sites were located, it would have been advisable for the authors to revisit these locations and report/compare their findings with this prior assessment using the same method. Instead, we are presented with another inventory that pales in comparison to what was reported in the prior study (e.g., 25 species of fish reported in the EIA vs 48 in the management plan; 11 vs 13 species of hard coral).

Negative Environmental Impacts

In this section, the authors do little to discuss how this proposed project will affect the many biotas discussed above (i.e., birds, plants, reptiles, mammals) - though they briefly mention turtle impacts. There are many data deficiencies, as highlighted above; and we see no attempt to elucidate how the habitat loss and degradation, caused by this hotel, could affect the structure of the biological communities discussed. Though not included in the EIA, these concerns were submitted to Niles and Associates in several reports from environmental NGOs, namely: 1) Gaea Conservation Network, Grenada Fund for Conservation, and Heritage Research Group Caribbean - covering several biotas, coastal processes, archaeology, and hydrology; 2) Environmental Protection in the Caribbean (EPIC) - focusing on seabirds; and 3) Ocean Spirits - focusing on turtles.

⁸ Grenada Coral Reef Foundation (2018). Management Plan for the Levera Marine Protected Area 2019-2023. Ridge to Reef Project. 38pp

⁹ Grenada Coral Reef Foundation (2018). Baseline Assessment of Coral Reef Condition within the Coastal Areas of Levera. Assessment Report. Ridge to Reef Project. 17pp

- **Amphibians:** Assuming there is an increase in nutrient-rich surface runoff from the golf course, hotel, and construction activities into the wetland, we could see as much as a 15% decline in survival of amphibians and a 5% decrease in mass.¹⁰ Consequently, whichever amphibians are currently present may become less prevalent over time.
- **Birds:** Given the extensive removal of vegetation that is needed to accommodate this project and the associated increase in noise/lighting, we anticipate detrimental impacts on the bird community in Levera. The loss of vegetation will lower the habitat available for birds to forage and nest; and based on the design, the resulting fragmentation would make it easier for mammals to predate the much lower abundance and diversity of birds that will remain. Another way in which the habitat will be degraded is through the added visual stimuli (18 story towers and infrastructure proposed for the wetland itself), which some birds are known to avoid. Noise, both during and after construction, is another way in which the habitat will be degraded - sounds that overlap with the frequency of their calls and songs will make it difficult for birds to communicate during courtship or warn each other of impending danger (e.g., predator is present).¹¹ The golf course, which requires extensive habitat removal, will likely worsen habitat fragmentation in Levera, possibly leaving the remaining vegetation patches too small to support the diverse bird community that it currently supports. This change in habitat structure may result in some migratory birds, particularly those that use both mangroves and upland habitat and frequent the area yearly, to be less successful on their journey to nesting habitat (i.e., not able to forage enough and increase fat stores sufficiently for long flight).¹²
 - When we focus on seabirds, these impacts will be likely exacerbated. In a submission by EPIC to Niles and Associates, the author highlights that because of this development, we may observe: 1) lowered nesting success from higher human

¹⁰ Egea-Serrano, A., Relyea, R. A., Tejedo, M., & Torralva, M. (2012). Understanding of the impact of chemicals on amphibians: a meta-analytic review. *Ecology and evolution*, 2(7), 1382-1397.

¹¹ Zhou, Y., Radford, A. N., & Magrath, R. D. (2019). Why does noise reduce response to alarm calls? Experimental assessment of masking, distraction and greater vigilance in wild birds. *Functional Ecology*, 33(7), 1280-1289.

¹² Schmaljohann, H., Eikenaar, C., & Sapir, N. (2022). Understanding the ecological and evolutionary function of stopover in migrating birds. *Biological Reviews*, 97(4), 1231-1252.

disturbances on offshore islands; 2) increased mortality of nocturnal seabirds from collisions associated with artificial lighting from the hotel; 3) higher mortality from bilge and oil spills on offshore islands; 4) collisions, resulting in death, into hotel infrastructure; and 5) increased mortality during storms from seabirds that typically used wetland for shelter.¹³

- **Vegetation:** Based on vegetation surveys by Gaea Conservation Network in 2020, and sediment cores in 1992,¹⁴ it is likely that the mangroves in Levera represent one of the oldest stands on Grenada, with pollen for red and black mangrove, buttonwood, and

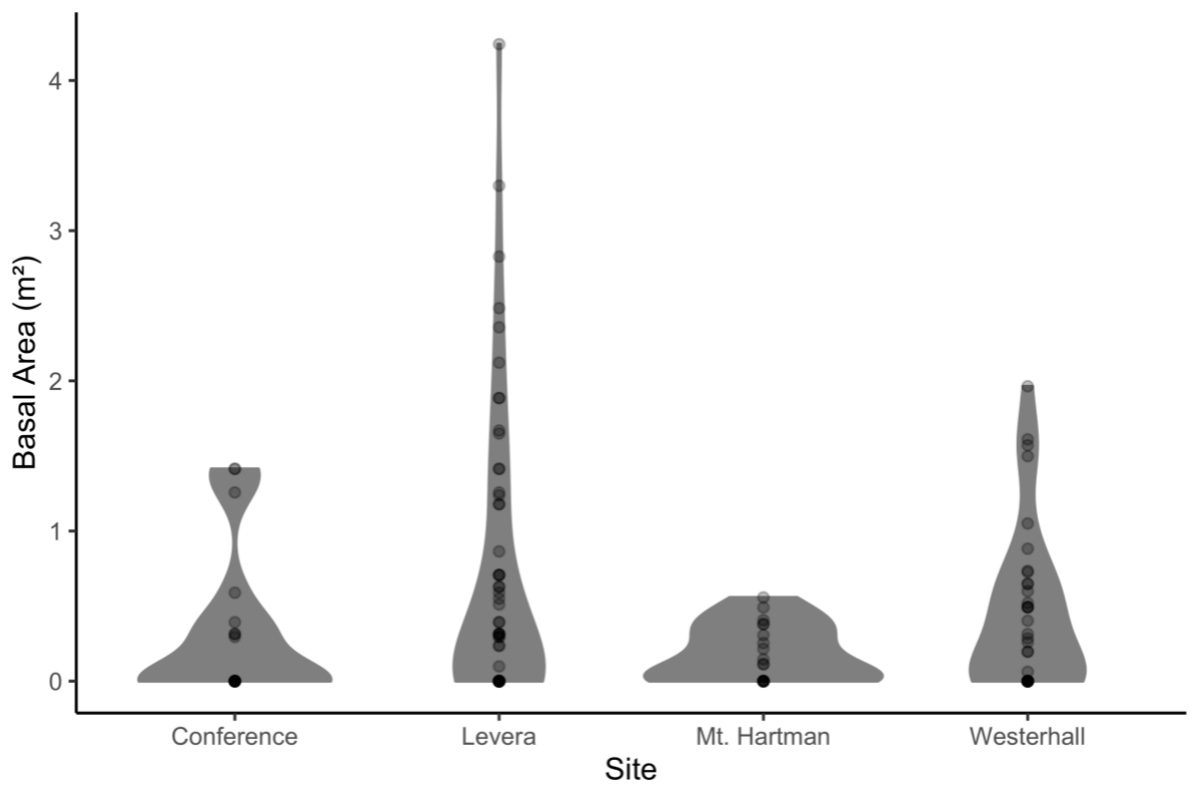


Figure 1. Average basal area of mangroves surveyed in 2020 at four sites in Grenada - basal area is the cross-sectional area of a tree trunk measured using diameter at breast height (DBH) and can be used as a proxy of tree age (source: Gaea Conservation Network).

¹³ EPIC. 2020. Effects of Levera Development on Seabirds. Green Cove Springs, Florida, USA.

¹⁴ Sharman, M. Y. (2004). Vegetation and Sea-Level History of a Mangrove Swamp at Levera Pond, Grenada. National Library of Canada= Bibliothèque nationale du Canada, Ottawa.

manchineel going back at least 2500 years (the maximum depth of the cores). The vegetation surveys by Gaea Conservation Network showed that when compared to mangroves in Conference, Mt Hartman, and Westerhall, the basal area (a proxy for tree age) of Levera mangroves were typically higher (**Figure 1**).

- **Mammals:** While invasive mammals may see benefits from this development, the native species will likely be negatively impacted. Mongoose, cats, and rats may have an easier time scouting the area (for nesting and foraging birds) with the now highly fragmented natural habitat. However, for the native, nocturnal mammals (bats, opossums), the loss of vegetation as well as increased human disturbances (noise and lighting) will make this area less suitable.
- **Reptiles:** There are a plethora of potential negative impacts of this development on turtles. The proposed jetty, if constructed, will leave the beach inhospitable to turtle nesting. Increased surface runoff during construction, which is likely sediment-heavy, can result in beach sand that hatchlings are unable to penetrate when emerging from the nests.
- **Water quality:** The loss of vegetation will result in much poorer water quality (in the lake, pond, and nearshore beach area), which will have serious implications for amphibians, fish, plants, and birds. In addition to the vegetation loss for the hotel itself, that loss to accommodate the golf course can increase surface run-off to wetland and beach area, particularly during the construction phase. Under a prior project, this sediment-heavy surface run-off resulted in cement-like conditions on the beach, which made the area inhospitable for nesting turtles. Even after the golf course and hotel are built, the loss of vegetation can result in nutrient-rich surface runoff (concrete is impervious and fertilizers/irrigation for golf courses increase nitrogen and phosphorus content in ground and surface water),¹⁵ which can result in eutrophic conditions in the

¹⁵ Bock, E. M., & Easton, Z. M. (2020). Export of nitrogen and phosphorus from golf courses: A review. *Journal of environmental management*, 255, 109817.

pond and lake. Such conditions can lead to toxic conditions for fish, plankton, and invertebrates,¹⁶ which can lower food availability for birds.

- **Marine Biotas:** Even in 2018, the coral and herbivore fish diversity in Levera Bay was low. At that time, the authors of the Marine Protected Area Management Plan recommended additional pollution work to lower pollution levels and more work to lower habitat destruction. With a proposed hotel and golf course, we can only expect additional stressors on the coral reefs within the Bay, which this EIA does not discuss.¹⁷

Mitigation

This section, just like the one above, lacks any discussion on mitigation measures given the disastrous impacts this development will have on the terrestrial biota as discussed above. The authors simply recommend “avoid unnecessary removal of vegetation”, which in no way addresses the numerous negative impacts we discuss above. The most feasible mitigation strategy would be to significantly reduce the footprint of this development (perhaps using the cabanas/eco-lodges model of a prior proposed development) and removing the proposed golf course from the plan. Given that a study led by SPECTO suggests that the wider community believes this area should be protected, it is already considered to be a National Park and it is carded for a Marine Protected Area with an established Management Plan, no project of this size should be recommended for this important area.

- Nesting sea turtles can benefit from: 1) reduction of resort footprint and especially exclusion of the beach from any development; 2) re-evaluation/relocation/removal of planned jetty, which would impede turtle access to the beach; 3) use of red lights for any paths near the beach front to reduce light pollution.
- Seabirds can benefit from: 1) implementation of emergency plans, in case of bilge or oil spills; 2) no allowances of hotel guests/staff to offshore islands during breeding season (April-August); and 3) low impact alternatives to artificial lights.

¹⁶ Rosset, V., Angélibert, S., Arthaud, F., Bornette, G., Robin, J., Wezel, A., ... & Oertli, B. (2014). Is eutrophication really a major impairment for small waterbody biodiversity?. *Journal of Applied Ecology*, 51(2), 415-425.

¹⁷ Grenada Coral Reef Foundation (2018). Management Plan for the Levera Marine Protected Area 2019-2023. Ridge to Reef Project. 38pp

Water & Wastewater

- **Sewage:** Absent from these plans is how wastewater and sewage will be managed for the Grenada National Resort at Levera – this would be contrary to the Waste Management Act of 2001.
- **Water Demand:** This project is likely to have large demands on NAWASA’s water supply for the Levera area (especially for the Golf Course). Given the forecasted decline in precipitation for Grenada based on recent Regional Climate Models,¹⁸ it is unclear if NAWASA’s current and future supply could meet this additional demand.
- **Hydrological Modeling:** Based on flow accumulation/direction models for Levera (**Figure 2**), built from a digital elevation model, water from upland areas is naturally directed to the areas in and around the proposed hotel. With the extensive removal of vegetation, we may likely see increases in the volume of water directed to this area, as well as the wetland and beach. Lacking in this EIA and plans is how these impacts would be mitigated. Available are recent LiDAR data (2016 for bathymetry and 2017 for terrestrial), which should have been used to evaluate these impacts (and recommend mitigation or alternative plans to manage these effects).

¹⁸ Climate Studies Group Mona (Eds.). 2020. “The State of the Caribbean Climate”. Produced for the Caribbean Development Bank.



Figure 2. Flow accumulation model overlaying "new" schematic from Niles Assoc/Heng Sheng EIA, showing direction of water flow (darker colors = higher volume/accumulation); based on DEM from NOAA NCEI (2017), satellite imagery from ESRI c.2017; note labels in Chinese.

Public Consultation & Social Considerations

- No discussion is documented with local development at Bedford point or Bathway communities
- Limited hiring of local people – the development has brought in foreign workers from the start. Large staff dormitories planned as part of the development may tell the real picture.
- No reference to users of the beach for recreation – where are considerations for continued beach access?
- No feedback provided from GLA members or other NGOs were incorporated into the EIA despite having provided this to the EIA practitioner beforehand
- Plans for a Casino at Levera have not been made clear, nor have the potential social considerations been highlighted.

Conclusions/Recommendations

As recommended by Gaea Conservation Network, Grenada Fund for Conservation, Heritage Research Group Caribbean¹⁹ and EPIC²⁰, we believe that there should be substantial reduction in the size and footprint of this proposed hotel. Ideally, the hotel itself should be modeled as eco-lodges, and not 16 or 18 story mega towers. Similarly, the golf course, if left in the plan, should also be significantly reduced in its size. Also, there should be no activities or infrastructure placed within the wetland and there should be, at minimum, 100 meters of littoral woodland vegetation left around the wetland edge to serve as a buffer.²¹

There should be no development on the beach and coastal vegetation fringing the beach should be left intact, keeping in mind the 50m setback in planning regulations, the Fisheries (Levera Beach Closed Area) regulations, and the 2019 ICZM Act. Any changes to the RAMSAR site should be a

¹⁹ Gaea Conservation Network, Grenada Fund for Conservation and Heritage Research Group Caribbean. 2020. Levera Resort Grenada: Review of Landscape Plans & Supporting Documents. St. George's, Grenada.

²⁰ EPIC. 2020. Effects of Levera Development on Seabirds. Green Cove Springs, Florida, USA.

²¹ McElfish, J. M. J., Kihlsinger, R. L., & Nichols, S. S. (2008). Planner's Guide to Wetland Buffers for Local Governments. Washington, D.C: Environmental Law Institute. Retrieved from www.eli.org



comprehensive public consultation process led by the Government as this affects the country's international obligations.