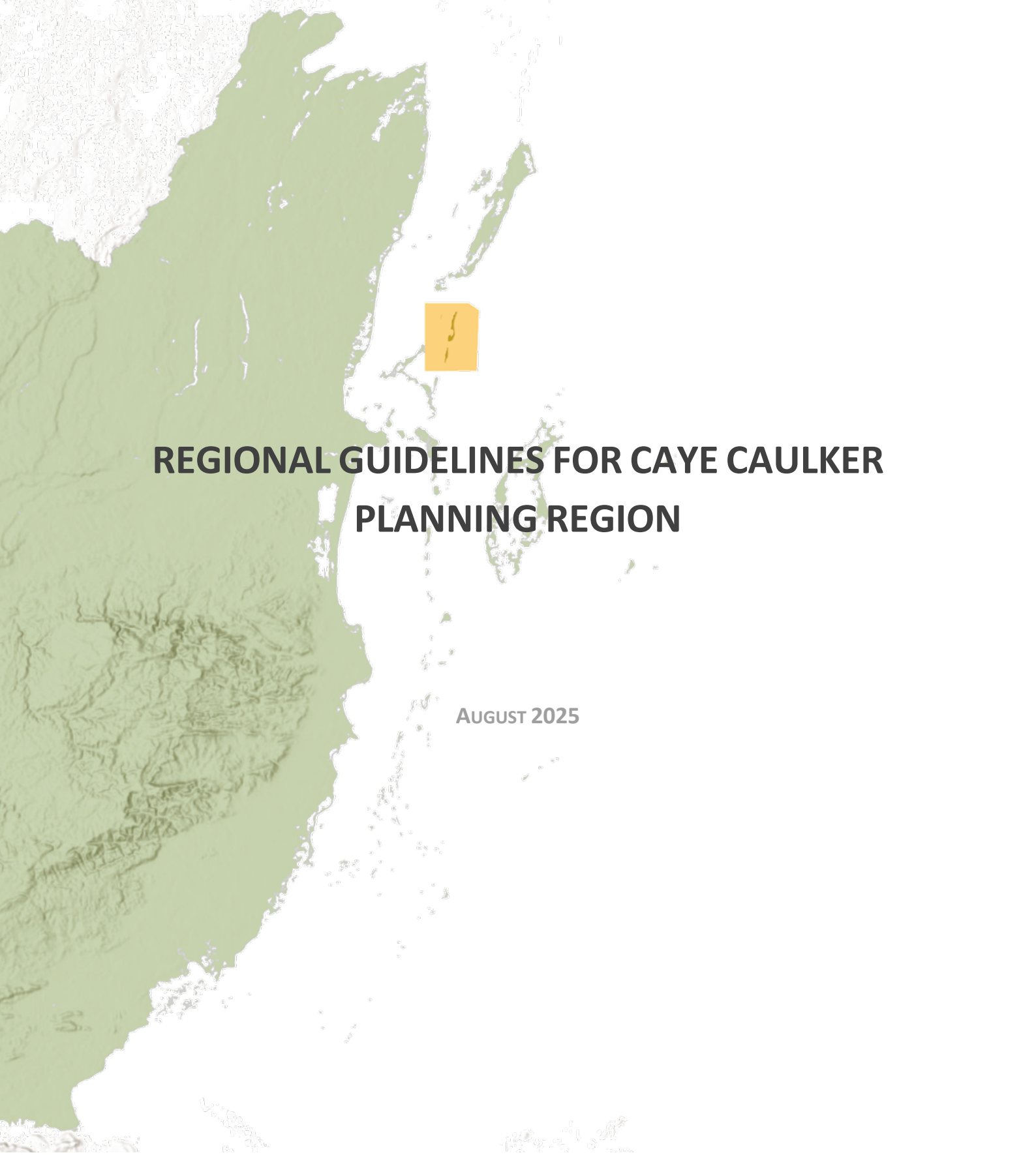

REGIONAL GUIDELINES FOR CAYE CAULKER PLANNING REGION

AUGUST 2025

MAIN CHARACTERISTICS OF THE COASTAL PLANNING REGION

Population
Approximately 2,700 (SIB, 2022)

Coastal communities and major population centers (highlighted)
Caye Caulker, Caye Chapel (SIB, 2022)

Cayes
Caye Caulker, Caye Chapel

Area Approximately 235 km^2
Aquatic: 230 km^2
Cayes: 5,03 km^2

Ecosystems
Seagrass beds, Coral reefs, Mangroves

Major Sources of Income
Tourism and hospitality, Fishing

Main topics
Tourism, Fishing, Marine Transportation, Marine Dredging and Mining, Land Use and Development, Environment, Disaster Risk Management

OUTLINE OF THE DOCUMENT

1 INTRODUCTION TO THE REGIONAL GUIDELINES

The management of the Caye Caulker´s coastal zone should follow the recommendations and action lines proposed in the National Integrated Coastal Zone Management (ICZM) Plan and be linked to the goals and aspirations of the local community. The sustainable development of the caye, considering the actual capacity of the territory is one on the major concerns of the local stakeholders.

Therefore, this Regional Guideline has been developed to:

- Present updated information on Habitat Risk Assessment (HRA), a useful tool for assessing potential impacts and informing environmental conservation decision-making.
- Present updated information on the disaster risk profile to contribute to a more resilient development of the coastal zone.
- Summarize the key issues and challenges of the region, by identifying the strengths, weaknesses, opportunities and threats (SWOT analysis) and collecting feedback from Coastal Advisory Committees (CAC).
- Formulate a set of recommendations to be developed in the region, in collaboration with local committees and stakeholders.
- Provide information on sectoral recommendations for development standards.

To this end, this document is structured in the following sections:

- Section 1. Caye Caulker Planning Region: presents information on ecosystem services and HRA, disaster risk and SWOT analysis
- Section 2. ICZM recommendations: this section presents the key issues identified combining literature review and stakeholder consultations and informs the formulation of a set of recommendations and actions, supported by a four-year implementation, monitoring, and evaluation plan.
- Appendix: including (i) recommendations for community and caye development, as outlined in the *Interim National Integrated Coastal Zone Management Plan: 2020-2025*, align with the *National Guidelines for the Subdivision and Consolidation of Land* from the Lands Department; and (ii) recommendations from the *National Sustainable Tourism Master Plan*, updated in 2023.

The information presented in this document has been prepared using a combination of technical and participatory approaches. The technical process included the review of existing studies and previous ICZM Plans and the performance of the Habitat Risk Assessment model. The participatory approach included the organization of two rounds of consultation with the CAC in Caye Caulker. The first meeting, held on December 8, 2024, focused on the identification of key challenges and needs in the Coastal Planning Region. The second meeting, held on March 27, 2025, focused on the validation of proposed key issues and recommendations and the prioritization of actions.

Figure 1. First meeting with local stakeholders (Island Magic Resort Conference Room, December 8, 2024).

Figure 2. Second meeting with local stakeholders (Island Magic Resort Conference Room, March 27, 2025).

2 THE CAYE CAULKER PLANNING REGION

2.1 ECOSYSTEM SERVICES AND HABITAT RISK ASSESSMENT

In the Caye Caulker region, coral reefs are a very important habitat, but most of them are at high risk (83%) (Figure 3, Table 1). The main stressors contributing to this risk are transportation, recreation, and fishing. Mangroves occupied a low extension but are also at high risk (91%), especially due to infrastructure development, dredging and flooding. Finally, seagrass beds, that occupied most of the region (the shallower one), are mostly at medium risk (57%). The inner part is the one at high risk due to development, fishing, recreation and transportation.

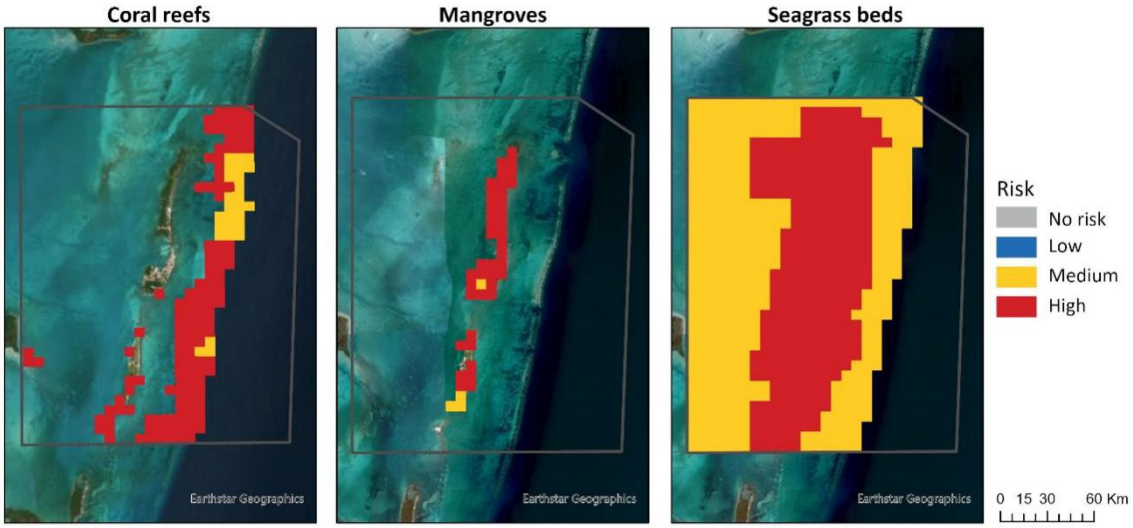

Figure 3. Coral Reef, mangroves and seagrass beds classified as high, medium and low risk for current human activity (2025) in Caye Caulker.

Table 1. Habitat Risk Assessment InVEST model outputs for Caye Caulker.

Habitat	No risk (km^2)	Low Risk (km^2)	Medium Risk (km^2)	High Risk (km^2)
Coral Reefs	0	0	6.5	31.75
Mangroves	0	0	1	10
Seagrass	0	0	101.25	76.75

2.2 DISASTER RISK AND CLIMATE CHANGE ADAPTATION

Caye Caulker Planning Region faces multiple hazards and risks related to coastal dynamics and climate change. Extreme heat and humidity, intensified by climate change, pose significant challenges which disrupt normal functioning operations. Due to cayes conforming low lying areas, such regions are also very highly exposed to tropical cyclone effects and storm surges. Flood mapping related to tropical cyclones (see Figure 4) indicates that Caye Caulker Village's west coast is the most severely impacted area under current and pessimistic climate change scenario (IPCC AR5 RCP8.5 by 2050, resulting in a sea level rise of 0.275m) for storms with return periods of up to 100 years (1.3 m both scenarios). For higher return periods (500 years) most

parts of the Coastal Planning Regions (CPR) get flooded under current and pessimistic climate change scenarios, leading to flood heights of up to 2 m (Martínez et al., 2022).

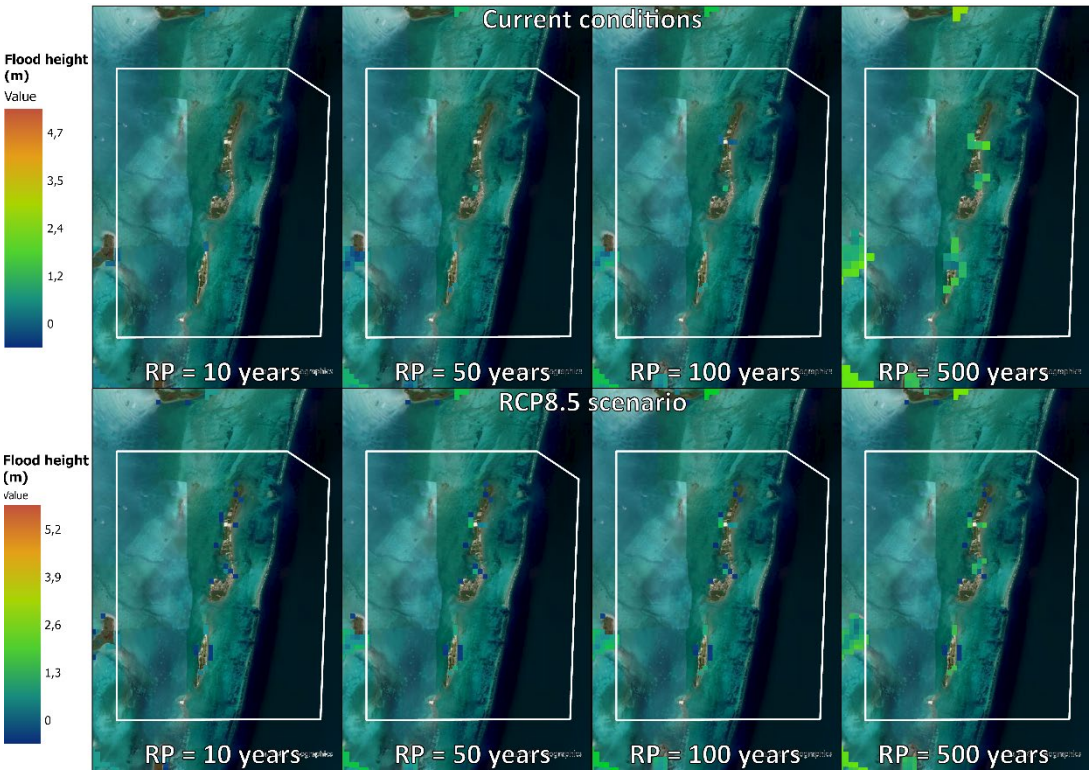

Figure 4. Maps with the 10, 50, 100 and 500 years return periods of extent and depth of flooding for current conditions and for the RCP8.5 climate change scenario by 2050 (SLR= 0.275 m) for Caye Caulker Planning Region. (Source: Martínez, J. et al., 2022)

Coastal erosion is another critical concern, particularly in The Split area, which experiences ongoing shoreline retreat. Mangroves play a key role in mitigating its effects, by providing a natural shield for these areas. According to Martínez et al. (2022), Belize's mangroves significantly reduce erosion caused by tropical cyclones, maintaining shoreline retreat in Caye Caulker below 0.24 m under current conditions and below 0.6 m under pessimistic scenarios. However, in sandy coastal areas of the region, shoreline erosion (without considering beach resilience, i.e., the ability of a beach to recover naturally from erosion caused by storms or climate change effects) is projected to reach up to 1 m for 100-year storms under current scenarios, but under a pessimistic scenario, the same retreat is already expected for 50-year storms.

Caye Caulker's vulnerability is primarily driven by inadequate emergency infrastructure (e.g., shelters) and economic reliance on tourism. The region's low coping capacity is evident in its limited evacuation resources and preparedness and dependence on external assistance during disasters. Additionally, weaknesses in governance and emergency response systems further constrain adaptation efforts, leading to a relatively low resilience to natural hazards. As a result, the region faces high multi-hazard risk, primarily driven by tropical cyclone winds, storm surges, and coastal erosion, requiring urgent improvements in disaster preparedness and adaptive capacity.

2.3 SWOT ANALYSIS

The following section presents a SWOT analysis of the CPR identifying elements or processes that need to be improved or strengthened (Weaknesses), mitigated (Threats), maintained (Strengths), and leveraged (Opportunities), which in turn help define coastal management objectives and recommendations. This analysis results from a careful assessment, including an in-person consultation process with local stakeholders and the CACs on December 8, 2024, and March 30, 2025; a review of existing studies of the coastal area available, and the analysis of previous ICZM Plans, together with the review of sectoral policies and plans.

Strengths:

- Unique natural and cultural landscape (proximity to the Belize Barrier Reef and marine biodiversity), supporting sustainable tourism.
- Strong local fishing traditions, which can be protected through targeted policies.
- Traditional lobster fishing is a significant part of Caye Caulker's identity, providing economic stability to local fishers.
- High ecological and environmental value due to habitats such as mangroves, seagrass beds and coral reefs and great diversity of marine life.
- Increasing interest in eco-tourism and sustainable tourism practices, promoted by Belize Tourism Board (BTB).
- Local economy enhanced through recreational industries, like diving, snorkelling, and sport fishing.
- Active participation of CAC in supporting sustainable development and coordination with other agencies.

Weaknesses:

- The rapid increase in tourism is putting excessive pressure on infrastructure and natural resources, with no enforced carrying capacity assessments or sustainable growth plan, leading to overcrowding and environmental degradation.
- Weak conservation culture, particularly in relation to mangrove protection.
- Weak understanding and implementation of eco-friendly practices that leads to green washing activities.
- Soil compaction from increased traffic and rapid, unregulated urban development leads to overcrowding, infrastructure strain, and stability issues.
- Making unauthorized construction is easier than obtaining legal permits.
- Cruise tourism from companies based in Belize City creates economic disparities on Caye Caulker, disadvantaging the local population and fuelling social tensions.
- Weak control of fishing licenses. The loss of traditional fishing rights, combined with habitat degradation (mangroves and seagrass beds), is threatening the sustainability of lobster fishing, which heavily depends on these vital nursery areas.
- Lack of enforcement of environmental and building regulations, e.g., coastal protection, pier construction, unregulated dredging and the 66-ft buffer zone.
- Imbalance between tourism development and local resource access, such as water and electricity supply.
- Insufficient infrastructure, emergency planning and inadequate fire prevention particularly for natural disasters (hurricanes, storm surges, fires).

- Erosion from dredging for land filling, particularly in The Split, along with poor wastewater management, contributes to marine pollution and the destruction of sensitive habitats.
- Limited community involvement in decision-making.
- Excessive privatization of coastline (mainly in northern part of Caye Caulker), with no areas for public access to the beach or for marine services, such as boat mechanics, painting and repair facilities.

Opportunities:

- Unique eco-tourism market: leverage Caye Caulker's distinctive natural and cultural heritage to attract environmentally conscious travellers.
- Increasing interest in nature-based tourism, which could promote more sustainable and low-impact visitor experiences.
- Balanced economic structure: Over time, the economic landscape may shift from external dominance to a more equitable model, empowering local entrepreneurship and decision-making.
- Innovative environmental leadership: position the caye as a national leader in sustainable practices such as waste management and renewable energy.

Threats:

- Tourism-related environmental degradation, e.g., mass tourism, coastal erosion, and uncontrolled construction.
- Loss of traditional fishing rights due to non-local fishers and weak licensing controls.
- Lack of coordination between government agencies, undermining sustainable development plans.
- Climate change and rising sea levels, threatening coastal infrastructure and the local economy exacerbated by mangrove clearing and loss of seagrass beds.
- Increasing privatization of beaches and coastal areas, restricting public access (e.g., Bahía Puesta del Sol).
- Water and energy shortages, worsened by uncontrolled tourism expansion.
- Increased economic inequalities originated due to foreign investment in hotels and resorts often not benefiting the local economy, endangering traditional livelihoods (e.g., traditional fishing and mechanical workshops).
- Conflicts between tourists and locals.

3 ICZM RECOMMENDATIONS

3.1 KEY ISSUES AND RECOMMENDATIONS

Table 2. Key issues and recommendations. ID refers to the Code of each Recommendation (R). S refers to the scale implementation of each recommendation: National (N), Local (L).

TOPIC	KEY ISSUES	ID	RECOMMENDATIONS	S*
Tourism	Rapid tourism growth.	R1	Carry out carrying capacity assessments to develop a tourism and land use plan agreed upon with local stakeholders.	N/L
		R2	Encourage sustainable transport (i.e., bikes) by regulating golf carts, expanding bike rentals, and creating pedestrian zones in high-traffic areas.	L
		R3	Establish public-private partnerships to align growth with eco-friendly practices and provide capacity building.	N/L
	Economic benefits do not reach Caye Caulker community.	R4	Establish a funding mechanism to support the local community, based on contributions from tourists and operators, and establish rules to ensure fair competition for local businesses.	N
Fishing	Loss of mangroves area.	R5	Legally protect mangrove and seagrass areas with regular monitoring, community engagement, and education on marine conservation. Implement the National Mangrove Restoration Action Plan currently under development.	N/L
	Competence and conflicts between local and Corozal fishermen.	R6	Establish working groups to address regional conflicts.	N/L
	Illegal fishing in MPAs	R7	Boost patrolling, especially in the early mornings, and use GPS tracking to deter illegal fishing in the MPA.	N/L

Marine Transportation	Water taxi routes and private piers are conflicting with areas for swimming and public beach access, particularly in the northern and southern parts of the caye.	R8	Elaborate a plan for regulating taxi docks and coastal structures.	N
		R9	Install navigation buoys and clear signage along water taxi routes to clearly designate safe paths for water taxis, ensuring they do not interfere with swimming or public beach areas.	N/L
	Aging port facilities pose safety and environmental risks.	R10	Elaborate a plan for renew port infrastructure.	N/L
	Boat residents increase marine pollution during peak seasons and lack marina infrastructures.	R11	Conduct anchoring carrying capacity along the coast of the caye and provide waste disposal points for boats. Enable areas for boat mechanics, painting and repair facilities.	L
Marine Dredging & Mining	Unregulated dredging and sand mining for beach nourishment, especially near The Split and the barrier reef, cause erosion, habitat loss, and seagrass damage.	R12	Elaborate guidelines to designate restricted zones (as part of the Marine Spatial Planning (MSP) zoning), best environmental practices and erosion control plans. Implement and enforce a Dredging Plan for North Caye Caulker.	N
Land Use & Development	Subdivisions are often conducted without consultation with local authorities, such as the Caye Caulker Village Council and continue despite community and CZMAI objections.	R13	Strengthen Coastal Zone Management Authority and Institute (CZMAI's) role and establish community participation mechanisms in the zoning process.	N/L
	Increasing construction of seawalls, piers and jetties leading to habitat degradation.	R14	Review existing regulations related to seawalls, piers and jetties construction to address environmental, physical and social impacts.	N
Environment	Increased privatization of coastal areas, limiting space for traditional fishing and local businesses.	R15	Establish legal mechanisms to protect access to traditional fishing areas and local business spaces.	N/L
	Developers exploit loopholes dividing	R16	Strengthen EIA regulations to address this challenge and analyse cumulative impacts.	N

	projects into smaller parts to avoid EIAs.			
	Poor wastewater management, including improper dumping of black water by hotels and street vendors, along with laundry water and microplastics, is polluting the marine environment.	R17	Establish stricter wastewater disposal regulations, with required pre-filtration, and enforcement measures, particularly for tourism-related businesses.	N/L
	Over-reliance on plastic packaging, improper waste sorting and trash disposal.	R18	Introduce stricter regulations on single-use plastics and promote community recycling initiatives, along with awareness campaigns to reduce microplastic pollution.	N
DRM	Sargassum influx causing ecological and economic challenges.	R19	Develop community-driven strategies for sargassum collection and explore innovative uses for repurposing sargassum waste (e.g., for biofuel).	N/L
	Low-lying areas (e.g., around the high school and the health center) and west coast communities (e.g., Bahía Puesta del Sol) are highly vulnerable to storm surges and flooding, impacting key infrastructure and livelihoods.	R20	Establish a working group between local stakeholders, CZMAI, National Emergency Management Organization (NEMO) and Land Use Dpt. to integrate Disaster Risk Management (DRM) into planning processes.	L
	Lack of adequate shelters and insufficient inland evacuation capacity, leading to reliance on external support	R21	Develop more resilient, locally accessible emergency shelters and improve evacuation planning and infrastructure, along with awareness campaigns led by NEMO.	N/L
	Fire prevention and building codes are not adequately enforced, increasing disaster risks.	R22	Enforce fire-resistant building materials, update and ensure compliance with fire safety codes, and increase fire prevention awareness campaigns.	L
	Unplanned coastal development, including pier	R23	Conduct an assessment of the cumulative impacts of coastal structures (e.g., piers, seawalls to	N

	construction and mangrove removal, is accelerating beach erosion and sedimentation, increasing vulnerability to climate change impacts.		guide future development and inform regulatory updates.	
		R24	Establish a national beach erosion monitoring program to systematically track shoreline changes and inform climate adaptation and disaster risk planning.	N
S: Scale: National (N) and local (L)				

3.2 IMPLEMENTATION, MONITORING AND EVALUATION PLAN

The implementation plan aims to establish priority recommendations to address the key issues of the CPR, as well as to define the actions needed to implement them. To this end, three recommendations have been prioritized, considering their relevance to local stakeholders, their feasibility of implementation during the four years of the ICZM plan, their potential to be applicable to other CPRs and their urgency in terms that have not been addressed during previous ICZM cycles. The selection of recommendations focuses on those at the CPR level, as national recommendations are addressed in the National ICZM Plan.

Following this approach, the prioritized recommendations for this CPR are:

- R1. Carry out carrying capacity assessments to develop a tourism and land use plan agreed upon with local stakeholders.
- R3. Establish public-private partnerships to align growth with eco-friendly practices and provide capacity building.
- R13. Strengthen CZMAI's role and establish community participation mechanisms in the zoning process.

The table below outlines the most relevant actions to be carried out for each priority recommendation. This implementation plan covers a four-year implementation period, specifying the stakeholders involved, progress indicators to track each action, and the baseline for comparison. To ensure effective implementation, a biannual report at the CPR level is required.

Table 3. Implementation plan for the prioritized recommendations.

ID	ACTION	STAKEHOLDERS INVOLVED	IMPLEMENTATION PERIOD Y1	Y2	Y3	Y4	PROGRESS INDICATOR
R1: Carry out carrying capacity assessments to develop a tourism and land use plan agreed upon with local stakeholders							
1.1	Develop a comprehensive carrying capacity study with the defined content. (Contents prosed by stakeholders*)	Local community, Non-governmental organization (NGOs), tourism stakeholders, real estate developers, fishers, local government, construction, business sector, BTB					Completion and publication of study
1.2	Use the Carrying Capacity Study to guide the Local Tourism and Land Use Plan	Village Council, Lands Department, Department of Environment (DOE), BTB, CZMAI					Completion and publication of the Plan
1.3	Make existing and future plans more accessible (e.g., online platforms, public forums).	Village Council, Lands Department, DOE, BTB, CZMAI, NGOs					Number of outreach activities / platforms created
R3: Establish public-private partnerships to align growth with eco-friendly practices and provide capacity building.							
3.1	Establish partnerships to encourage eco-friendly practices through regulation, grants, loans, incentives, marketing.	CZMAI, BTB, Belize Chamber of Commerce, MSME, developers					Number of partnerships and incentive schemes established
3.2	Establish partnerships with local NGOs to educate and provide capacity building for the private sector on actual eco-friendly practices vs. green washing.	Local NGOs, CZMAI, developers					Number of trainings/workshops conducted; number of people or businesses outreached
3.3	Develop guidelines for environmentally friendly practices specific to Caye Caulker.	CZMAI, DOE, NGOs, local tourism groups					Guidelines published and used in EIA review process
3.4	Development Finance Corporation (DFC) financing for renewable energy options, environmentally friendly alternatives for tourism sector and fishers.	Development Finance Corporation Belize (DFC), tourism sector, fishers					Number of loans approved / projects implemented
R13: Strengthen CZMAI's role and establish community participation mechanisms in the zoning process.							

13.1	Create a permanent working group to strengthen relations between local and national stakeholders on zoning and urban development issues, led by CZMAI.	CZMAI, DOE, Lands Department, Ministry of Natural Resources, Village Council					Number of meetings by year
13.2	Develop a roadmap to establish participatory zoning schemes, to be agreed with national competent institutions.	CZMAI, DOE, Lands Department, Ministry of Natural Resources, Village Council					Zoning regulations gazetted
13.3	Formalize CZMAI's and Village Council´s advisory role in subdivision and zoning decisions through inter-agency MOUs	CZMAI, DOE, Ministry of Natural Resources, Ministry of Sustainable Development, Lands Department					Signed MOUs referencing CZMAI's advisory role
13.4	Conduct active 3rd party consultation to involve the community, ensure neutrality, broader engagement, and clearer reporting mechanisms.	CZMAI, local NGOs, Village Council, community leaders					Number of consultations held and feedback integrated

* Proposal for minimum contents of the carrying capacity study (1.1):

- Delimitation of areas for development, conservation, public, utilities, coastal
- Water, sewage, solid waste, electrical grid, telecommunication and food provision infrastructure capacity
- Data on over-night and cruise tourism with future projections
- Data on seasonal variation in demand and supply
- Housing for work force considering upcoming development, including Caye Chapel
- Rate of accommodation development, capacity of accommodations
- Caye Caulker Marine Reserve capacity: visitors and guides
- Availability of goods and services, capacity for importing, space for necessary infrastructure
- Capacity for golfcarts, vehicles, boats
- Fishing grounds, capacity for fishers, seafood consumption
- Study on nearshore water quality, reef health to assess waste water/run-off effects

4 APPENDIX

The sectoral recommendations for development standards in terrestrial zones and cayes, as outlined in the *Interim National Integrated Coastal Zone Management Plan: 2020-2025*, align with the *National Guidelines for the Subdivision and Consolidation of Land* from the Lands Department. The following sections present these recommendations in detail.

4.1 RECOMMENDATIONS FOR COMMUNITY AND CAYE DEVELOPMENT

Table 4. Recommended land use for cayes in the Caye Caulker Planning Region

COMMUNITY	RECOMMENDED DEVELOPMENT DENSITY	RECOMMENDED DEVELOPMENT STANDARDS
Caye Caulker	Low – Medium Density	Residential
Caye Chapel	Low – Medium Density	Residential III

4.2 NSTMP RECOMMENDATIONS

The *National Sustainable Tourism Master Plan*, updated in 2023, provides an overarching tourism policy and strategic planning instrument. It spans a 20-year period (2010-2030) and highlights 8 contemporary themes regarding tourism. The following themes and actions are established for the Caye Caulker Planning Region:

<u>Urban Settlement & Management</u>

1.2 Better control new tourism development within towns in visually sensitive locations.

1.4 Improve reticulated utilities, services and infrastructure in urban and tourism growth areas.

1.6 Enhance the resilience of established urban settlements in vulnerable (low lying, coastal or floodplain) locations.

1.7 Ensure the (real and perceived) safety and security of all visitors (at day and night) in tourism towns is prioritised.

1.8 Showcase distinctive urban-historic-cultural-natural assets and experiences in tourism township areas.

<u>Coastal Conditions & Resilience</u>

2.3 Better understand the influence of climate change and sea level variation in coastal and lagoon settings (forecast mapping).

2.4 Support revegetation and enhancement of the coastal and lagoon edges through contiguous linear land planning.

2.5 Ensure development is well setback from the coastline/lagoon edge to avoid visual intrusion and potential harm from encroachment.

2.7 Minimize the intervention of structures (jetties, groins and other projections) into coastal or lagoon flats.

2.9 Improve the control and regulation of nautical recreation in the coastal and lagoon areas.

<u>Marine, Reef and Caye Condition</u>

3.1 Designate, protect and strengthen the UNESCO reef system and employ practices that minimize harm of tourism intervention/contact.

3.2 Undertake research and monitoring to better measure the impact of climate and water temperature change of reef systems.

3.3 Policing of illegal fishing and related behaviours that compromise reef & biosphere conditions.

3.4 Acknowledge the critical role of caye and reef management by NGO and seek a coordinated approach to tourism practices.

3.5 Control and monitor major boating (cruise and other private craft) routes to avoid harm to the reef network.

3.6 Better management of recreation air & boat traffic in and around the reef and cayes.

3.7 Apply carrying capacity measures to public cayes with the prospect of visitor quotas and seasonal limits.

3.8 Recognise the delicate environmental condition of cayes and establish common development regulations.

3.10 Promote and educate tourism industry (and visitors) on sensitivity of reef and biosphere conditions.

<u>Trunk Infrastructure and Connectivity -Accessibility</u>

6.5 Aim to increase potable water storage and sewage treatment in tourism destinations, including new sustainable systems.

6.6 Develop funding models (such as tourism development contributions) to improve investment and maintenance of infrastructure.

6.9 Expand the capability and service of National Information & Technology (Internet) to support wider tourism market and aid communications, emergency management, and climate threats.

<u>Regional Linkages and Frontier Interfaces</u>

7.1 Enhance regional tourism connections to cayes and interior through improved public/private transit– unlocking potential market growth.

7.6 Encourage sensitively sited and designed marina facilities at coastal nodes only for regional nautical recreation and aquaculture tourism.

<u>Tourism Governance Management and Marketing</u>

8.1 Adopt the Spatial Tourism Framework as a national network of hubs, nodes, and corridors to aid decision-making on planning and investment.

8.4 Avoid the privatization of cayes, islands, and beachfronts, and compulsorily acquire or buy back vulnerable land where possible.

8.6 Promote the use of clean energy and sustainable land and management for tourism development and services.

8.8 Build capacity within the education sector to deliver decentralized tourism training that can engender improved local jobs and services such as tourism training academy.

8.9 Increase capacity of local tourism authorities to manage operator compliance (noise, behaviour, waste).

8.13 Establish relationships between government and universities to grow GIS capability in support of resilient tourism development.

8.14 Restore tourism standards program to benchmark with other regions (i.e. ASEAN) and promote information technologies.

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