Name of Document	BMEP - Biodiversity Monitoring and Evaluation Plan of HICHA JOY PROJECT
Date of last update	5/15/2024
Frequency of updates	Bi-annual
Code	
Responsible	

ONSHORE MONITORING

Receptor/Action	Mitigation	Indicator(s)	Indicator Use	Current Status	Trend	NNL or NG Achieved?	Desired Outcome	Adaptive Management	Associated Management & Monitoring Plan(s) or Docs	Frequency of Monitoring & Reporting	Period	Responsible
Habitat reinstatement	Restoration of habitats temporarily disrupted within terrestrial pipeline installation	1) Density of native plants (ind/ha) 2) Area (ha)	Required to verify Net gain	Habitats degraded but still functioning, influenced by activities such as grazing and clearing	No data yet	Planned to achieve Net Gain	No Net Loss	If monitoring and assessment show that the current restoration techniques are ineffective, adaptive management will allow for adjustments such as altering planting strategies, improving soil	Coastal Ecosystem restoration Management plan	Report after 1 year and 3 years to confirm growth and assess replanting	2024-2028	JH (QHSE Engineer) Contactor Biodiversity specialist
	Creating small islands within the wetlands to provide nesting and foraging grounds for birds.	Number of bird species present and the overall abundance of birds in the created islands	Evaluating Mitigation Measures	Only one small tidal island is present	No data yet	Planned to achieve NG	5 islands created	If we notice during the monitoring phase that certain bird species are not utilizing the small islands as expected for nesting and foraging, then we can consider adapting ther management approach.	Management of nest sites for colonial waterbirds, A J Crivelli, J Jalbert (eds) Conservation of Mediterranean wetlands n°4, Station Biologique de la Tour du Valat, Arles (France)	Monitoring and Reporting - Biannual	2025-2030	JH (QHSE Engineer) Biodiversity specialist
		Number of Hectares planted	Required to verify Net Gain	Habitats degraded but still functioning, influenced by activities such as grazing and clearing	No data yet	Planned to achieve NG	201,3 hectares planted and certified by relevant authorities. (First certification, for planting, occurs in year 1. Second certification, for successful establishment, occurs in year 5).	If planted areas are not certified by by relevant authorities, must be replanted.	Coastal Ecosystem Restoration Management Plan. Potential utilisation of halophytes for the Rehabilitation and valorisation of salt-affected areas in Tunisia. Abdelly et al. (2006) in Biosaline Agriculture and Salinity Tolerance in Plants Edited by M. Oztürk, Y. Waisel, M.A. Khan and G. G Birkh Verlag/Switzerland	Montly Dashboards / Biannual Reports	2025-2030	JH (QHSE Engineer) Biodiversity specialist
Habitat enhancement within the IBA/KBA of Sabkhet Dhreia	Planting native specimens of halophytic plants and other species adapted to saline and arid conditions.	1) Density of plants (ind/ha) 2) Shannon-Wiener index 3) Pielou's evenness index (J') 5) Richness of native species	Required to verify Net Gain	No data yet	No data yet	Planned to achieve Net Gain	A baseline study in an equivalent area must be conducted to identify the initial conditions and allow for a comparison to measure improvements and calculate the Quality-Hectares gained.	If planted areas do not achieve targets, additional restoration treatments required at site	Coastal Ecosystem Restoration Management Plan			JH (QHSE Engineer) Biodiversity specialist
		Expert evaluation on the efficiency of the restoration efforts.	Supporting information	To be completed 5 years after replanting	NA	Planned to achieve Net Gain	Receive written expert analysis confirming planted hectares are on adequate restoration trajectory, supported by evidence of species composition and	If restoration areas are not on adequate trajectory, additional restoration treatements required at site	Coastal Ecosystem Restoration Management Plan	One report 5 years after planting	2025-2030	JH (QHSE Engineer) Biodiversity specialist
	Manage invasive species that may compete with native vegetation and compromise restoration efforts	Invasive Species Abundance	Required to verify Net Gain	No data yet	NA	Planned to achieve Net Gain	Reduicing 30 % of the invasive species in planted area	If initial control efforts for a particular invasive species prove ineffective or result in unintended consequences, then reassess the management approach and consider alternative strategies, such adjusting timing or methods of control	Coastal Ecosystem Restoration Management Plan	Monitoring and Reporting - Biannual	2025-2030	JH (QHSE Engineer) Biodiversity specialist
	Provide assistance to existing local monitoring programs to address Kentish plover, with a focus on the critical habitat area where the project site is located.	Number of local monitoring programs and frequency of data collected on the Kentish plover population in the critical habitat area	Supporting information	Winter bird count by two organizations (AAO and the University of Gabès) conducted only once	NA	Planned to achieve Net Gain	Better understanding the population dynamics and habitat requirements of Kentish plovers, leading to more targeted conservation efforts and potentially	Implement necessary adjustments to the management plan including enhancing habitat protection measures and increasing monitoring frequency,	Monitoring programm of AAO Monitoring programm of University of Gabès	Annual report	2024-2028	JH (QHSE Engineer) University of Gabès AZHST Ascob syrtis

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Conservation and Management Initiatives for Biodiversity Protection in the Project Area of influence	Provide support to local organization to manage and reduce non-natural predation risks, enhancing nesting success for priority species.	Nesting success rates for priority species after implementing support programs	Supporting information	The area has been impacted by the invasion of stray dogs a due to urban waste being dumped near the IBA	NA	Planned to achieve Net Gain	Improved nesting success for two priority species	Implementing different or additional methods to control non-natural predators	Monitoring programm of AAO Monitoring programm of University of Gabès	Biannual report	2025-2030	JH (QHSE Engineer) University of Gabès AZHST Ascob syrtis
	Provide funding to support the development of a Management plan of the Ramsar Site "The Wetland Complex of Chott el Guetayate and Sebkhet Dhreia, and the Oueds (rivers) Akarit, Rekhama, and Meleh"	The amount of funding allocated and disbursed for the development of the management plan	Supporting information	There is currently no management plan for this site	NA	Planned to achieve Net Gain	Facilitate coordinated conservation efforts and ensure that management approaches are based on scientific recommendations, leading to better protection and restoration of habitats	Will be included in the management plan	National Report on the Implementation of the Ramsar Convention on Wetlands: National Report COP 13, Dubai, 2018	One management plan after 7 years	2025-2035	JH DGF APAL
	Coastal zone of the Ramsar site Clean up events	Volume of Waste Collected	Supporting information	Approximately 15.6 kilograms of plastic litter accumulate per kilometer of coastline per day according to Chaabane et al. (2024) (Key Indicator Development for Marine Litter Management in Tunisian	NA	Planned to achieve Net Gain	Clean-up event undertaken every year		ADOPT A BEACH Initiative of WWF TounesCleanUp Initiative	Annual report	2025-2030	JH (QHSE Engineer) AZHST Ascob syrtis
	Increase awareness of the local community on the biodiversity value of the area	The number of people attending conservation events	Supporting information	Need baseline survey	NA	Planned to achieve Net Gain	Supporting efforts to reduce human impacts in the IBA/KBA/Ramsar site	School-based biodiversity initiatives.		Annual report	2025-2030	JH (QHSE Engineer) AZHST Ascob syrtis

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		Number of hectares restored	Required to verify NG	2,9 ha will be lost after dredging activity	No data yet	Planned to achieve Net Gain	>2.9 ha of seagrass restored	If monitoring and assessment show that the current restoration techniques are ineffective, adaptive management will allow for adjustments such as modifing shoot anchorage	Seagrass restoration management plan	Montly Dashboards / Biannual Reports	2026-2027	JH (QHSE Engineer) Seagrass restoration specialist
Seagrass restoration	Replanting seagrass in areas where the habitat has been disturbed	1) Seagrass Coverage (%) 2) Seagrass Density (shoots/m²) 3) Survival Rate (%) 4) Growth Rate: Rhizome expansion (cm/year)	Required to verify Net gain	1) Intertidal seagrass coverage = 50 %; Subtidal seagrass coverage = 65 % 2) Intertidal seagrass Density = NA; Subtidal Seagrass Density = 456 shoots/m2	No data yet	Planned to achieve Net Gain	1) Intertidal seagrass coverage > 50 %; Subtidal seagrass coverage > 65 % 2) Subtidal Seagrass Density > 456 shoots/m2	If planted areas do not achieve targets, additional restoration treatments required at site	Seagrass restoration management plan	Seagrass restoration management plan	2026-2027	JH (QHSE Engineer) Seagrass restoration specialist

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		Expert evaluation on the efficiency of the restoration efforts.	Supporting information	To be completed 2 years after replanting	NA	Planned to achieve Net Gain	Receive written expert analysis confirming planted hectares are on adequate restoration trajectory, supported by evidence of seagrass vitality	If restoration areas are not on adequate trajectory, additional restoration treatements required at site	Seagrass restoration management plan	One report 2 years after planting	2029	JH (QHSE Engineer) Biodiversity specialist
Deployment of artificial reefs structure	Mitigation of habitat loss and enhancement of biodiversity through the deployment of artificial reef structures	1) Number of artificial reef deployed 2) Species diversity within artificial reef 3) Structural integrity of artificial reef installations	Assess effectiveness of artificial reefs	Baseline surveys will be conducted	No data yet	Planned to achieve Net Gain	Deployement of 24 artificial reefs Increased species diversity and abundance within artificial reef habitats;	Develop a management plans that include a concise description of management responses to environmental triggers and potential cumulative impacts	Artificial reef management plan	Annual monitoring and report	2026-2030	JH (QHSE Engineer) Biodiversity specialist
	Seagrass Monitoring in Response to Brine Discharge Impacts	1) Salinity profiles in the brine discharge zone 3)Temperature, dissolved oxygen, total nitrogen, and total phosphorus 2) Shoot recruitment, mortality rates in a Permanent sampling transect in two controls station and near the brine discharge 3) Epiphytes	Supporting information	Near the discharge :1) *P. oceanica* coverage = 65 % 2) *P. oceanica* Density = 456 shoots/m2 Control stations : to be identified	No data yet	Not applicable	Three monitoring station: One in front of the desalination plant discharge, and two controls, one of them, 2 km North and another one 2 km South, Compaign in winter and summer Threshold of difference of 10% based on these baseline levels	If lethal effects on *P. oceanica* are observed, the brine discharge should be diluted with by-passing seawater	Brine discharge monitoring plan .	Biannual Monitoring and report (summer and winter	Every year	JH (QHSE Engineer) Biodiversity specialist
Brine discharge monitoring	Monitoring of benthic community near the Brine Discharge	Biotic indice: BOPA (Benthic Opportunistic Polychaetes and Amphipods) in controls station and near the brine discharge	Supporting information	No data yet	No data yet	Not applicable	Three monitoring station: One in front of the desalination plant discharge, and two controls, one of them, 2 km North and another one 2 km South, Compaign in winter and summer Threshold of difference of	If change is observed, the brine discharge should be diluted with by-passing seawater	Brine discharge monitoring plan .	Biannual Monitoring and report (summer and winter	Every year	JH (QHSE Engineer) Biodiversity specialist
	Monitoring of fish communities (including all species that triggered Critical habitat)	Fish abundance and size assessed by visual census along 50-meter transects in the effluent area and at one control station	Supporting information	No data yet	No data yet	Not applicable	Three monitoring station: One in front of the desalination plant discharge, and two controls, one of them, 2 km North and another one 2 km South, Compaign in winter and summer Threshold of difference of	If change is observed, the brine discharge should be diluted with by-passing seawater	Brine discharge monitoring plan .	Annual Monitoring	Every year	JH (QHSE Engineer) Biodiversity specialist