

MANAGEMENT UNIT (MU) (LOCATION)	MANAGEMENT OBJECTIVES	MANAGEMENT STRATEGIES	ISSUE/IMPORTANCE/REASON	RESPECTIVE RESPONSIBLE AGENCIES
MU04	Coastal Bund <ul style="list-style-type: none"> Ensure sufficient mangrove cover 	<ul style="list-style-type: none"> Annual monitoring of mangrove cover from satellite image should be carried out. Width of mangrove cover less than 150m means the bunds will have to be raised to prevent overtopping. Width of mangrove cover less than 50m means protection works must be constructed on the bunds. Mangrove loss can be overcome by constructing escarpment protection such as the type constructed along the coastline of Sabak Bernam, Selangor. 	<ul style="list-style-type: none"> Mangrove cover fronting the bund is important in preventing bunds from overtopping and damage from wave action. 	<ul style="list-style-type: none"> JPS
	<ul style="list-style-type: none"> To keep record and update the bund levels. To maintain safe bund levels and making sure that the bunds are in good condition. Ease for bund improvement/repair. 	<ul style="list-style-type: none"> All bund levels must be above 2.91m LSD. Carry out annual monitoring of bund levels and top up bunds where necessary. <ul style="list-style-type: none"> Monthly monitoring of the bunds. Biannually bund level measurements Carry out immediate improvement/repair on damaged and insufficient bund levels. Check for mud lobster burrows. Where mud lobster burrows are allowing sea water to seep through the bund, the seepage must be plugged quickly. 	<ul style="list-style-type: none"> Insufficient information on the bund levels, for reaches that have coastal bunds. Seawater overtopping the bunds during HAT and storm surge. Bund damage due to storm surge, human activity and mud crabs. 	

		<ul style="list-style-type: none"> • Monitor coastline movement annually using satellite imagery. • Where aquaculture ponds are located seawards of the bund, the seaward line of the ponds must be adequate protection against erosion and bund breach. Proper revetment must be constructed. 	<ul style="list-style-type: none"> • Settlement of bund due to heavy vehicles. 	
	Setback <ul style="list-style-type: none"> • Necessary deviations to allow for existing infrastructures and predicted movement of shorelines. 	<ul style="list-style-type: none"> • Setback have been determined based on the coastal features and important infrastructure. Generally, the DID guidance of landward of the tree line 400m for mangroves and 60m landward of the Highest Astronomical Tide contour for sandy beaches is followed. However, deviations were necessary to allow for existing infrastructures such as roads and bunds where the authorities will be required to maintain the line. In such cases, the setback is placed landward of the infrastructure (see Appendix Bund Mangrove Cover and Setback). • The DSS should be used to determine the setback required for future developments. 	<ul style="list-style-type: none"> • Allow for movement of the shoreline. 	
	Tidal Gates <ul style="list-style-type: none"> • Improve the flushing capacity and the function of the tidal gates 	<ul style="list-style-type: none"> • One example of maintaining boat access is what is adopted at Sungai Pulai, Sabak Bernam, where the fishing community maintain the channel by plying their boats along the channel to create propeller wash that agitates the mud and prevent consolidation. • Breakwaters at the outlets can be constructed to prevent sediments from entering the 	<ul style="list-style-type: none"> • Navigation – difficulty for the fisherman boats to manoeuvre in and out where places with tidal gates. • Insufficient flushing capacity leads to sedimentation in front of the tidal gates. 	

		channels and create tidal prism that will aid in flushing during ebb flows.		
	Sea Level Rise <ul style="list-style-type: none"> • Maintain and improve the usability and performance of the tidal gates • To make sure that developments along the coastal area are constructed away from flood prone areas. • Developments along the shoreline must take into account Sea Level Rise. 	<ul style="list-style-type: none"> • Existing drainage systems will require improvement or adaptation. • Pumps maybe required to assist in evacuation of flood water. • Bund levels will have to be increased. • Determine practical setbacks along the coastal area. • To include the sea level rise value (aside from wind setup, storm surge and wave runup) in the calculation of the platform/finish level of a design. 	<ul style="list-style-type: none"> • Tidal gate usability and performance • Coastal flooding 	

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MU04	Marine Capture Fisheries <ul style="list-style-type: none"> To ensure high standards of fish quality, enhanced food safety and nutritional value through provision of better fisheries infrastructures and facilities. 	<ul style="list-style-type: none"> Upgrade the fisheries infrastructure at Kuala Gula fish landing points. 	<ul style="list-style-type: none"> Lack of fisheries infrastructure at most fish landing points. 	<ul style="list-style-type: none"> Lembaga Kemajuan Ikan Malaysia (LKIM)
	<ul style="list-style-type: none"> To promote sustainable fishing methods and practices. 	<ul style="list-style-type: none"> Strengthen the surveillance and enforcement. 	<ul style="list-style-type: none"> Utilization of unsustainable fishing gear as a common fishing method practice. 	<ul style="list-style-type: none"> Malaysian Maritime Enforcement Agency Department of Fisheries
	Aquaculture <ul style="list-style-type: none"> To minimize the potential of water quality degradation from aquaculture activities. To promote sustainable aquaculture practice. 	<ul style="list-style-type: none"> Provision of proper wastewater treatment facilities at aquaculture farms to reduce discharge of untreated water directly into the river. Regular maintenance of the wastewater treatment facilities. Encourage aquaculture farmers to get MyGAP certification. 	<ul style="list-style-type: none"> Degradation of water quality due to the untreated wastewater discharge from brackishwater pond culture. 	<ul style="list-style-type: none"> Department of Fisheries

	<ul style="list-style-type: none"> To promote sustainable aquaculture practice. 	<ul style="list-style-type: none"> Promote programmes related to the restoration and replanting of suitable mangrove species Prohibition of new development plans within mangrove areas. Restoration of abandoned farms as an alternative to minimize the development of new aquaculture farms. Reforestation of abandoned shrimp farms. 	<ul style="list-style-type: none"> Aquaculture activities or coastal modification contributes to mangrove degradation. 	<ul style="list-style-type: none"> Department of Forestry Department of Fisheries PlaNMalaysia Perak
	Recreational Fisheries <ul style="list-style-type: none"> To improve recreational fisheries infrastructures and facilities. 	<ul style="list-style-type: none"> Upgrade the recreational fisheries infrastructure (Kuala Gula) Upgrade/Additional septic tanks/toilets (Kelong off Sg. Gula) 	<ul style="list-style-type: none"> Limited recreational fisheries infrastructures and facilities. 	<ul style="list-style-type: none"> Local Authority
	<ul style="list-style-type: none"> To promote good fishing practices in recreational fishing activities. 	<ul style="list-style-type: none"> Strengthen the surveillance and enforcement. 	<ul style="list-style-type: none"> Unregistered fishing boat for recreational fishing activities can lead to unsustainable fishing and safety issues. 	<ul style="list-style-type: none"> Malaysian Maritime Enforcement Agency

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MU04	<ul style="list-style-type: none"> Promoting High Productivity Modern Agriculture 	<ul style="list-style-type: none"> Develop new high-tech and agricultural-based industrial zones. 	<ul style="list-style-type: none"> Proposed new industrial areas related to the processing, manufacturing, packaging, and distribution of seafood. The region will also contain marine product research and development centres. Industrial operations such as the production and processing of fish, shrimp, and other seafood were promoted. 	<ul style="list-style-type: none"> Department of Agriculture Majlis Daerah Kerian
	<ul style="list-style-type: none"> Realizing the Potential of Sustainable Tourism for Social and Economic Development 	<ul style="list-style-type: none"> Developing excellent, viable, and competitive tourism assets in the Kerian District 	<ul style="list-style-type: none"> Targeting international and domestic tourists The Visit Malaysia map includes Kuala Gula as one of the products. As a result, Kuala Gula's tourist products must be maintained and upgraded in order to compete with other eco-tourism products. 	<ul style="list-style-type: none"> Tourism Perak Tourism Malaysia Majlis Daerah Kerian
	<ul style="list-style-type: none"> Enhancing Urban Design and Creating an Identifiable Landscape 	<ul style="list-style-type: none"> Provide adequate, conducive, and safe open space by 2035 	<ul style="list-style-type: none"> To meet the needs of the population and create an environment of quality and prosperous living 	<ul style="list-style-type: none"> Majlis Daerah Kerian
	<ul style="list-style-type: none"> Preserving and Controlling Environmental Quality for Ecological Balance 	<ul style="list-style-type: none"> Management of Environmental Sensitive Areas (ESAs) 	<ul style="list-style-type: none"> Natural assets of different properties need to be integrated for development planning and control purposes. 	<ul style="list-style-type: none"> Perak Forestry Department Majlis Daerah Kerian

			<ul style="list-style-type: none"> • The RFN4 and the National Policy on Biological Biodiversity emphasize the conservation of natural resources because natural resources are national heritage assets that must be protected. 	<ul style="list-style-type: none"> • Perak State Government
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Because MU04 is the most prominent for agricultural activities, it is one of the best places for promoting high-productivity modern agriculture by application of new high-technology. However, it is prohibited in mangrove areas due to the acidic nature of the soils, which are unsuitable for agriculture. In addition, palm oil plantations close to mangrove areas should be well managed. This is because it poses risk to water quality and wildlife if the runoff contains pesticide residues. In the long run, all palm oil plantations must comply with Malaysian Sustainable Palm Oil (MSPO) standards.

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MU04	Mangroves <ul style="list-style-type: none"> To protect, conserve and rehabilitate the mangrove areas. To facilitate mangrove regeneration by implementation of appropriate tools and methods. 	<ul style="list-style-type: none"> Gazettement of mangroves areas as Permanent Forest Reserve at state land mangrove forests. 	<ul style="list-style-type: none"> Mangrove serves various ecological importance such as providing protection and habitat for a wide diversity of aquatic species of different taxonomic groups. 	<ul style="list-style-type: none"> Department of Forestry
		<ul style="list-style-type: none"> Promote programmes related to the restoration and replanting of suitable mangrove species. Provision of buffer zone between mangrove and development areas. Restoration of abandoned farms as an alternative to minimize the development of new aquaculture farms. Reforestation of abandoned shrimp farms. 	<ul style="list-style-type: none"> Potential mangrove forest degradation due to coastal and aquaculture developments. 	<ul style="list-style-type: none"> Department of Forestry Land Office PlaNMalaysia Perak Department of Fisheries
	Marine Mammals <ul style="list-style-type: none"> To conserve and protect marine mammals. 	<ul style="list-style-type: none"> Minimize large-scale coastal developments and modifications near identified core habitats of cetaceans Minimize coastal modifications i.e., coastal shrimp farming, coastal reclamation, and the clearing of fringing mangrove forests 	<ul style="list-style-type: none"> Potential marine mammals' disturbance due to coastal developments and modifications. 	<ul style="list-style-type: none"> PlaNMalaysia Perak Department of Fisheries Department of Forestry Land Office
		<ul style="list-style-type: none"> Implement and enforce fisheries regulation to restrict the use of high-risk bycatch gears 	<ul style="list-style-type: none"> Utilization of unsustainable fishing gear could impose significant threat 	<ul style="list-style-type: none"> Department of Fisheries

		<p>especially within marine mammals' hotspot areas.</p> <ul style="list-style-type: none"> Promote utilization of sustainable fishing gears within the Important Marine Mammal Area (IMMA). 	<p>towards marine mammals within Perak coastline.</p>	
		<ul style="list-style-type: none"> Collect and analyse data from to help inform effective mitigation to reduce vessel collisions with marine mammals. 	<ul style="list-style-type: none"> Marine mammals are susceptible to injury and mortality from vessel collisions. 	<ul style="list-style-type: none"> Department of Fisheries Marine Department

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MU04	Wastewater discharge <ul style="list-style-type: none"> Control of untreated discharge from the agriculture areas such as irrigation canal, discharge from aquaculture ponds and surface runoff from the oil palm plantation containing contaminants from the fertilizers and pesticides. 	<ul style="list-style-type: none"> Increase the awareness on the importance of Good Agricultural Practices (GAP). GAP Certification will assist to enhance the traditional practices to be more sustainable. <i>Pewartaan Kaedah-Kaedah Perikanan (Akuakultur Perikanan Darat)</i> will also be introduced by the Department of Fisheries. Provision of Competent Person to operate the effluent treatment systems for the agriculture and aquaculture activities. Promote the use of environmentally friendly and biodegradable fertilizers and pesticides. Enhance the implementation of biological control for pest control. New aquaculture and agriculture activities that fall under the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015 must submit the EIA report to the Department of Environment for approval. New aquaculture and agriculture activities that do not fall under the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015 shall submit their 	<ul style="list-style-type: none"> Untreated discharge from the agriculture areas, discharge from aquaculture ponds and surface runoff from the oil palm plantation. Usage of synthetic fertilizers and chemical pesticides. Deforestation of mangrove areas. 	<ul style="list-style-type: none"> Department of Environment Department of Fisheries Department of Forestry Local Council
	Fertilizers and Pesticides <ul style="list-style-type: none"> Control the usage of synthetic fertilizers and chemical pesticides. 			
	Conservation of the Mangrove Forest Areas <ul style="list-style-type: none"> Stop the deforestation of mangrove areas. Enhance mangrove replantation and rehabilitation of decaying mangrove forests. 			

		<p>development proposal to the Local Authority and conditions on discharge should be imposed on the operators.</p> <ul style="list-style-type: none">• Existing aquaculture ponds that are found to cause pollution by discharging untreated wastewater shall be warrant with a stop work order.		
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