MANAGEMENT UNIT (MU) (LOCATION)	MANAGEMENT OBJECTIVES	MANAGEMENT STRATEGIES	ISSUE/IMPORTANCE/REASON	RESPECTIVE \RESPONSIBLE AGENCIES
MU15	Coastal Bund • Ensure sufficient mangrove cover	• 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.	• Mangrove cover fronting the bund is important in preventing bunds from overtopping and damage from wave action.	• JPS
	• 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.	• All bund levels must be above 2.91m LSD. Carry out annual monitoring of bund levels and top up bunds where necessary. o Monthly monitoring of the bunds. o 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. • Monitor coastline movement annually using satellite imagery.	• 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. • Settlement of bund due to heavy vehicles.	

		• 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.		
	Setback • Necessary deviations to allow for existing infrastructures and predicted movement of shorelines.	• 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.	• Allow for movement of the shoreline.	
	River mouths • Maintain river mouth for navigation to important fishing landing site	• The channel should be dredged to at least -0.5m below MSL to allow access for small sampans and fishing boats that are using the jetties. Dredging should be done every 5 years or when required (see Appendix Outlets Require Maintenance).	• Insufficient depth	
	Tidal Gates • Improve the flushing capacity and the function of the tidal gates	• One example of maintaining boat access is what is adopted at Sungai Pulai, Sabak Bernam, where the fishing community maintain the channel by plying	• Navigation – difficulty for the fisherman boats to manoeuvre in and out	

		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 channels and create tidal prism that will aid in flushing during ebb flows.	where places with tidal gates. • Insufficient flushing capacity leads to sedimentation in front of the tidal gates.	
	Sea Level Rise • 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.	• 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.	• Tidal gate usability and performance • Coastal flooding	

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MU15	Marine Capture Fisheries • To ensure high standards of fish quality, enhanced food safety and nutritional value through provision of better fisheries infrastructures and facilities.	• Upgrade the fisheries infrastructure at respective fish landing points (Sg. Tiram, Teluk 3 and Parit Haji Dolah)	• Lack of fisheries infrastructure at most fish landing points	• Lembaga Kemajuan Ikan Malaysia (LKIM)
	• To improve the navigation of fishing vessels at the affected areas.	• Undertake maintenance dredging with proper planning and mitigation measures.	• Siltation problem at Sg. Tiram, Teluk 3 and Parit Haji Dolah have prevented safe passage for fishing vessel during low tides.	• JPS • Marine Department • Department of Fisheries
	Aquaculture • To minimize the potential of water quality degradation from aquaculture activities. • To promote sustainable aquaculture practice.	• Provision of proper wastewater treatment facilities at aquaculture farms to reduce discharge of untreated water directly into the river. • Regular maintenance of the treatment facilities. • Encourage aquaculture farmers to get MyGAP certification.	• Degradation of water quality due to the untreated wastewater discharge from brackishwater pond culture.	• Department of Fisheries

	• To promote sustainable aquaculture practice.	• 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.	• Aquaculture activities or coastal modification contributes to mangrove degradation.	• Department of Forestry • Department of Fisheries • PlaNMalaysia Perak
	• To conserve natural spatfall and cockle farming through protection of mudflat areas.	• Mudflats and natural spatfall areas gazetted as fisheries protected area. • Propose Aquaculture Industrial Zone (AIZ) for cockle farming.	• Mudflat areas serve as important grounds for natural spatfall and cockle farming off Tg. Kepah to Teluk 3	• Department of Fisheries
	Recreational Fisheries • To improve recreational fisheries infrastructures and facilities.	• Upgrade the recreational fisheries infrastructure at Parit Haji Dolah • Upgrade/Add septic tanks/toilets	• Limited recreational fisheries infrastructures and facilities at Parit Haji Dolah.	• Local Authority
	• To promote good fishing practices in recreational fishing activities	• Strengthen the surveillance and enforcement.	• Unregistered fishing boat for recreational fishing activities can lead to unsustainable fishing and safety issues.	• Malaysian Maritime Enforcement Agency

MANAGEMENT UNIT (MU) (LOCATION)	MANAGEMENT OBJECTIVES	MANAGEMENT STRATEGIES	ISSUE/IMPORTANCE/REASON	RESPECTIVE \RESPONSIBLE AGENCIES
MU15	• Accelerate the growth of industry, tourism, agriculture and commercial	• Increase aquaculture productivity	• Develop aquaculture activities as a complement to the district's fisheries sub-sector to increase the food resources of the district and the state, as well as increase the income of aquaculture breeders.	• LKIM • Department of Fisheries • PTD Bagan Datuk
	• Convince infrastructure reliability	• Improving the traffic management system in the city center (provision of a lorry depoh center in Lekir)	• Able to reduce heavy vehicles from stopping on the shoulder of the road. • Reduce Road accidents. • Provide comfort to road users.	• MIROS • JKR
		• Creates a clean, conducive, and quality environment by improving sewerage system and solid waste management	• Provide a modern solid waste landfill with the latest disposal methods to accommodate the area in the south of Manjung District in the future.	• JPS • PTD Bagan Datuk

MU15 is dominated by agriculture activities which are palm oil plantation and aquaculture activities. These activities also can create job opportunity and increasing the economic productivity. Infrastructure is also critical in supporting the agricultural sector and ensuring efficient production, by improving the traffic and introducing proper solid waste management.

MANAGEMENT UNIT (MU) (LOCATION)	MANAGEMENT OBJECTIVES	MANAGEMENT STRATEGIES	ISSUE/IMPORTANCE/REASON	RESPECTIVE \RESPONSIBLE AGENCIES
MU15	Mangrove • To protect, conserve and rehabilitate the mangrove areas. • To facilitate mangrove regeneration by implementation of appropriate tools and methods.	• Gazettement of mangroves areas as Permanent Forest Reserve at state land mangrove forests.	• Mangrove serves various ecological importance such as providing protection and habitat for a wide diversity of aquatic species of different taxonomic groups.	• Department of Forestry
		• Rehabilitation, restoration and replanting of suitable mangrove species at the affected areas.	• Degradation of mangroves area at some part within Perak coastline due to the coastal erosion.	• Department of Forestry
		• 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.	• Potential mangrove forest degradation due to coastal and aquaculture developments.	• Department of Forestry • Land Office • PlaNMalaysia Perak • Department of Fisheries
	Mudflats • To protect and conserve the mudflat areas.	• Minimize coastal developments in respect to mudflat areas.	• Coastal development within Perak coastline possesses adverse impacts towards adjacent mudflat areas.	• Pejabat Tanah dan Galian (PTG) Perak

		• Mudflats and natural spatfall areas gazetted as fisheries protected area.	• Mudflat areas serve as important grounds for natural spatfall and cockle farming off Tg. Kepah to Teluk 3	• Department of Fisheries

MANAGEMENT UNIT (MU) (LOCATION)	MANAGEMENT OBJECTIVES	MANAGEMENT STRATEGIES	ISSUE/IMPORTANCE/REASON	RESPECTIVE \RESPONSIBLE AGENCIES
MU15 (Pantai Tanjung Kepah)	• To develop proper road / accessibility along the beach	• Develop accessibility along the beaches	• The road / access to the beach is too small	• JKR • PTD • Majlis Perbandaran Manjung • Tourism Perak • Tourism Malaysia

MANAGEMENT UNIT (MU) (LOCATION)	MANAGEMENT OBJECTIVES	MANAGEMENT STRATEGIES	ISSUE/IMPORTANCE/REASON	RESPECTIVE \RESPONSIBLE AGENCIES
MU15	• Control of effluent discharge from palm oil mills. • Control the use of fertilizers and pesticides.	• Promote the use of biological control and more environmentally friendly/biodegradable fertilizers and pesticides. • New agricultural 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 agricultural activities that do not fall under the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015 shall submit their development proposal to the Local Authority and conditions on discharge should be imposed on the operators.	• Effluent discharge • Use of fertilizers and pesticides.	• Department of Environment • Department of Agriculture • Local Council