

Project name: MED4EBM - Mediterranean Forum For Applied Ecosystem-Based Management
Application case: EB-ICZM for Tyre Coast Nature Reserve
Report type: Thematic Scoping
Issued by: Tyre Coast Nature Reserve



Mediterranean Forum For Applied Ecosystem-Based Management



Item	Description	Key management issues	Key stakeholders
Biophysical systems	Identify each of the main components which constitute the key coastal and marine biophysical systems (e.g. climate; hydrological and hydrogeological system; coastal vegetation types; wetlands;...	Identify the most important management issues (e.g. resource uses and/or conflicts; ecological problems/threats) and try to associate them with the related "biophysical component" by listing each of them in the same line as that of the related...	Identify the most important stakeholders (e.g. institutional management, data provider, resources user) and try to associate them with the related "biophysical component" by listing each of them in the same line as that of the related component.
☐ Wetland	Wetland is designated as Ramsar site.	Presence of an invasive plant species <i>Heterotheca subaxillaris</i> , spreading at the expense of the natural wetland flora and threatening the ecosystem's wellbeing. (data to be added)	Institutional management (TCNR management team). Scientific expertise (flora experts). Professor (data provider)
☐ Springs of Ras El Ain	Springs are located in the Agricultural zone of the reserve, provide domestic water to Tyre city and its suburbs, irrigation water to Ras El Ain lands, and flow out into the sea constituting an Estuary, due to the mixture of salt and fresh waters. Estuary is rich in biodiversity, key environment...	- Pollution with agrochemicals. - Possible leakage of formal dumpsite's leachates to the groundwater sources of Ras El Ain. (data to be added)	Farmers (A). Union of Tyre Municipalities (B). OMSAR (B). Ministry of Environment (B). Institutional management (TCNR management team) (A & B).
☐ Sand Dunes Ecosystem	Located in the conservation zone, with well-established relative vegetation. Important nesting site for sea turtles (<i>Caretta caretta</i>).	Disturbance and vandalism by trespassing polluters. Disturbance from the adjacent touristic zone's activities. In the South part of the Reserve there is another invasive species (flora.... Lantana, add species), already affecting the native flora. For now, this species is not affecting the Reserve yet.	Institutional management (TCNR management team). Municipality of Tyre. Ministry of Environment. International organizations involved in endangered sea turtles' conservation (SPA RAC; IUCN; MedPAN).
☐ Sandy Beach	The most beautiful and cleanest public beach in Lebanon.	Size of visitors during the beach season overcoming the carrying capacity of the touristic zone, stretching beyond the region covered by the 50 permitted kiosks (temporary hut-restaurants) by Ministry of Environment to both sides (northern and southern sides of the beach uncovered by the kiosks' services) by independent tourists who do not abide by the eco-rules...	Institutional management (TCNR management team). Municipality of Tyre. Ministry of Environment.
☐ Shallow water	Sea water, sea bottom, intertidal zone. Very reach ecosystem, important species Seagrass (see species), two marine turtles, seahorses, ...marginatus, vermited snails.		
☐ Marine biodiversity			
☐ Deep water	Clean water.		
☐ Marine biodiversity			
☐ Agricultural Ecosystem			
☐ Sandy soil	Sandy soil (marine terraces)	Poorly managed agricultural practices. In particular seasonal vegetable crops, heavy use of chemicals, consequences in water quality. Additional info are needed (soil composition).	

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Alluvial Soil	alluvial soil (mainly clay; upper stream, where citrus are planted) used as irrigated vegetable production directly from the springs. Upper part citrus and banana, irrigated by wells and mainly from Litani project. (name project...) Agriculture is intensive. Fertilizers and other chemicals are...	Overexploitation of water (no data available). No policy in water management. There are studies in sediment quality in marine ecosystem (more urbanised), but not in this area. Anyway, neighbouring agricultural zone that are comparable. Here the eutrophication problem is not relevant yet.	
Plant species	Identify key groups of species which, for any reason, are of particular interest for the management of the focused ecosystems (e.g. endemic; threatened; invasive; commercial. Note that plant...	Identify the most important management issues (e.g. resource uses and/or conflicts; ecological problems/threats) and try to associate them with the related "biophysical component" by listing each of them in the same line as that of the related...	Identify the most important stakeholders (e.g. institutional management, data provider, resources user) and try to associate them with the related "biophysical component" by listing each of them in the same line as that of the related component.
<input type="checkbox"/> Rare/Threatened species			
Terrestrial Species	Ficus sycomorus. Pancratium maritimum.	Depend on the sand dunes' habitat, which is degrading on the national level, hence, became threatened species.	Farmers of Ras El Ain/TCNR agricultural zone (for F. sycomorus). Visitors/Trespassers of the Conservation zone where P. maritimum is found. Institutional management (TCNR management team)....
Marine species	Seagrasses Sea weeds. Macroalgae (Cystoseira sp., brown species)		Farmers of Ras El Ain/TCNR agricultural zone (for F. sycomorus). Visitors/Trespassers of the Conservation zone where P. maritimum is found. Institutional management (TCNR management team)....
<input type="checkbox"/> Endemic species			
Terrestrial Species	Astragalus berytheus.	Endemic to the Lebanese and Palestinian seashores, with habitat as sand dunes that are not found but in TCNR in Lebanon. 20 individuals few years, affected by invasion of exotic species. (Eterotica subaxillaris) Eradication of invasive species allowed recover, 2019: 67 individuals.	Institutional management (TCNR management team). Ministry of Environment.
<input type="checkbox"/> Invasive species			
Terrestrial Species	Heterotheca subaxillaris.	Wind-transported seeds from Palestine. Well established in the sand dunes of TCNR's Conservation zone.	Institutional management (TCNR management team). Scientific/Academic expertise (flora experts).
Marine species			Institutional management (TCNR management team). Scientific/Academic expertise (flora experts).
Other species			

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Animal species	=> Identify key groups of species which, for any reason, are of particular interest for the management of the focused ecosystems (e.g. endemic; threatened; invasive; commercial). => Identify also key groups/taxa which...	Identify the most important management issues (e.g. resource uses and/or conflicts; ecological problems/threats) and try to associate them with the related "biophysical component" by listing each of them in the same line as that of the related component.	Identify the most important stakeholders (e.g. institutional management, data provider, resources user) and try to associate them with the related "biophysical component" by listing each of them in the same line as that of the related component.
Mammals			Researchers & Universities (monitoring & evaluation). CNRS - Lebanon (monitoring & evaluation) Institutional management (TCNR team – M&E and conservation). Ministry of Environment (support and coordination of M&E and conservation endeavours).
Marine Mammals	Observation of marine mammals only from fishermen. There is a team to widely survey the marine mammals.		Researchers & Universities (monitoring & evaluation). CNRS - Lebanon (monitoring & evaluation) Institutional management (TCNR team – M&E and conservation). Ministry of Environment (support and coordination of M&E and conservation endeavours).
Terrestrial Mammals	1 rare (Acomys dimidiatus/Spiny mouse). 4 endemics (Pipistrellus kuhli ikhawanius/Kuhl's Pipistrelle; Rhinolophus euryale judaicus/Mediterranean Horseshoe; Vormela peregusna Syriaca/Marbled Polecat; Vulpus vulpus palaestina/ Red Fox). 3 Threatened (Pipistrellus kuhli ikhawanius/Kuhl's Pipistrelle; Rhinolophus euryale judaicus/Mediterranean Horseshoe; Vormela peregusna syriaca/Marbled Polecat).	Hedgehog is shot Wild boar is increasing. Hyena, wolf, fox, golden jackal are shot. Mouflon and Ibex are introduced. Feral dogs are hunted and shot for fun or protection. Rare: declining due to heavy persecution and loss of habitat. Endemic: Caves in adjacent hills and ravines (Kuhl's pipistrelle and Med. Horseshoe); Various habitats from sea level to 1450 m...	Researchers & Universities (monitoring & evaluation). CNRS - Lebanon (monitoring & evaluation) Institutional management (TCNR team – M&E and conservation). Ministry of Environment (support and coordination of M&E and conservation endeavours).

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Birds	<p>Checklist is updated. 4 Rare. 5 Endemic. 7 Threatened (globally: Falco naumanni/Lesser Kestrel (very rarely seen); Crex crex/Corncrake. Regionally: Glareola nordmanni/Black-winged Pratincole (very seen in Lebanon); Pycnonotus xanthopygos/Bulbul; Botaurus stellaris/Bittern; Ciconia ciconia/White Stork; Serinus syriacus/Syrian Serin). Storks marked and actively monitored.</p> <p>136 species registered during spring migration, 118 species during winter migration. (...add species.) Egyptian vulture is migrating opposite direction compared with the other species. The area is migratory flyway Resting areas Tabareja lake, between Palestine area and South Syria and Jordan. 436 species of migratory species across Lebanon arrive to Jordan. We can consider comparable species that are passing across TCNR.</p>	<p>They need to create Environmental Law Enforcement Unit (branch of Police force), now existing only in Beirut but not in all country. Poaching. One of the worst countries in terms of poaching. Measures now taken to stop the poaching, 75% birds saved compared with the past. South part is bad. Illegal hunting; Collaboration between conservationists and hunting associations.</p> <p>Pollution. Habitat fragmentation and loss: fire, destruction, climate changes, human development. New species breeding: Eurasian nuthatch; L. sandgrouse; European robin; white eyed gull. Awareness campaign: 5000 members active in Lebanon (FB group and direct campaign), birdwatchers and kids gaining awareness. Photograph competitions and birdwatching activities. Bird ringing activity is new coming project. Rescue centre in North Lebanon, receiving from all country.</p> <p>All stakeholders referenced in the next column have consorted to conduct a monitoring and study of TCNR's birds, which resulted with a recommendation for "BirdLife International" to designate the reserve as an Important Bird Area (IBA), as found qualified for this designation. The process is ongoing.</p> <p>Main threat: climate change, decrease and surface...</p>	<p>Police Unit. Researchers/Bird experts (Dr. Ghassan Jaradi) IUCN (donor of study). BirdLife International (Global organization for the conservation of birds). NGOs (SPNL – supervision and coordination) Ministry of Environment (coordination between the donor and the expert researcher, and support for TCNR). Institutional management (TCNR director, field coordination and data support). Bird Rescue centre Hunting associations (in FB and social media contacted by NGO and bird expert)</p>
Reptiles	<p>2 Globally threatened: Chelonia mydas/Green Marine turtle; and Caretta caretta/Logger-head marine turtle. 2 Regionally threatened: Chalcides ocellatus ocellatus/Ocellated skink; and Acanthodactylus shreiberi syriacus/Shreiber's lizard.</p>	<p>Ongoing project on the marine turtles. Both sea turtles (Green turtle and Loggerhead) are globally threatened mainly due to anthropogenic reasons (beach littering, marine pollution, accidental catch, noise and light pollutions, disturbance, egg harvesting), climate change, and degradation of nesting sites (sandy beaches) and habitats (Posidonia meadows)....</p>	<p>Ministry of Environment Institutional management (TCNR management team/monitoring, protection and awareness) International organizations: SPA RAC, MedPAN, IUCN, EU/ENI CBC MED Program (funding, training, technical support).</p>
Fish	<p>List of species in biodiversity report</p>	<p>Invasive species, some of them sold, some others are not edible and noxious for the marine ecosystem. Some of them damage the nets. They are increasing in variety and number in the last years.</p>	
Mollusca			

Item	Description	Key management issues	Key stakeholders
Echinodermata	Important sea star species		Check report SPA-RAC about the biodiversity
Spongi			
Coastal infrastructures	Identify the main groups/category coastal infrastructures (e.g. ports; marinas; hotels; road network; urban areas; irrigation and drainage networks).	Identify the most important management issues (e.g. ecological problems/threats related to the given infrastructure) and try to associate them with the related "biophysical component" by listing each of...	Identify the most important stakeholders (e.g. institutional management, data provider, user of the infrastructure) and try to associate them with the related "biophysical component" by listing each of...
Tyre fishermen port Pollution of the harbour. Some illegal fishing still exists. Non sustainable fishing practices need better control. Fish market launched but never operating (IUCN project). Boat licence in the port release by Ministry of Transport. Boat licence released by Agriculture Ministry Ministry of Public Works & Transport. Ministry of Agriculture (marine...		Pollution of the harbour. Some illegal fishing still exists. Non sustainable fishing practices need better control. Fish market launched but never operating (IUCN project). Boat licence in the port release by Ministry of Transport. Boat licence released by Agriculture Ministry	Ministry of Public Works & Transport. Ministry of Agriculture (marine patrol). Lebanese Army (navigation security). Tyre municipality (law enforcement regarding illegal fishing - marine patrol). Institutional management (TCNR marine guards).
Hotels and Restaurants on the coastal line		Solid waste and wastewater management. Dog access should be restricted and managed in a coherent way (either all or nobody).	Tyre municipality (solid waste collection & wastewater network and treatment plant operation). NGOs (waste management initiatives). Institutional management (TCNR: local community support and raising awareness).
Stone ponds	Ras El Ain springs are held in stone ponds built by the Phoenicians (5000 years ago), provide domestic water for Tyre city through irrigation pipes' network, irrigate all Ras El Ain's agricultural lands, and the remaining part...	Old and corrupted domestic water network. Possible water source pollution by agrochemicals.	Tyre municipality (water distribution management). Ministry of Public Works & Transport and Council of Development and Reconstruction (funding the replacement of the old network). Institutional management (TCNR experts to collaborate...
Palestine refugee camp.	It is managed by Palestinians and other local organizations, UNRWA.	TCNR is collaboration with the camp to carry out eco-friendly activities. Waste management. Very crowded area; ecosystem is not preserved because the urban area is densely inhabited (35000 people in 1.5 square Km) Water supplies....	

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Urban city and towns	Tyre: winter 60,000 / 140,000 summer people Road network enhanced but it needs to be improved, to decrease the traffic in the market area. Train railway was abandoned, it is in ruin. Helicopter "patch" close to the reserve, under the management of Lebanese Army, UNIFIL, Rest House resort....	Transportation and traffic Parking places Wastewater. Tyre installed sewage network of Tyre (World Bank). Implant of treatment of wastewater is not working yet. Solid waste management No waste facility for Tyre: now only dump sites	Ministry of Transport
Economic activities	Identify the main sectors of economic activities (e.g. agriculture; livestock; industry; fisheries; aquaculture; energy production; transport; tourism).	Identify the most important management issues (e.g. ecological problems/threats related to the given economic activity) and try to associate them with the related "biophysical component" by listing each of...	Identify the most important stakeholders (e.g. institutional management, data provider, economic actor) and try to associate them with the related "biophysical component" by listing each of them in...
☐ Tourism	Touristic-Archaeological sites (for which Tyre was declared by the UNESCO a World Heritage site) and the submerged old city ruins (accessed by diving).	DATA CHANGED from the crisis. Values volatile and not predictable. Seasonality of tourism makes it very concentrated during the summer season, exerting high pressure on the city's infrastructures, and the reserve's ecosystems and eventually its biodiversity. Some touristic activities cause wildlife disturbance/harm to the TCNR biodiversity. Lack of communication, in particular in the past. Now, in the last couple of years better relations. Tourists: variable origin, Lebanon tourists. Residents, emigrants. International tourists (in particular B&B), now suspended, it is not important compared with the others. There was/is not promotion campaign. Vegetables, meat, fruits, fish and sea food are local. Sewage issue and rubbish (B&B, in front of them). Cleaning process is made by hand, every manager is cleaning their patch. But there are other areas without cleaning activity. TCNR and municipality promoted recycling, but lack of...	SPA-RAC REPORT Tyre municipality: management of TCNR touristic zone (beach) during the summer season. Institutional management (TCNR management team). Ministry of Environment: Authority of reference for legal and eco-friendly exploitation of TCNR's touristic zone by the municipality of Tyre. Operators of the huts at TCNR's touristic zone (pay monthly fees against permits provided by Tyre municipality for 4 months to provide culinary and touristic services at the beach of TCNR). Divers, kayak owners, boat owners (diving, sea tours organization by kayak or boat). Hotels and restaurants' owners and operators. Ministry of Culture & Ministry of Tourism (management of Tyre archaeological sites). Committee representatives of the 49 + 1 huts. Municipality (rubbish management) AirB&B group. Council for reconstruction and development....

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Air B&B	<p>AirB&B, Hotels and restaurants, Huts (they dismantle them during winter; they operate mid-May/15 October).</p> <p>AirB&B is not inside the Reserve, but in the surrounding area.</p>	<p>DATA CHANGED from the crisis. Values volatile and not predictable.</p> <p>Seasonality of tourism makes it very concentrated during the summer season, exerting high pressure on the city's infrastructures, and the reserve's ecosystems and eventually its biodiversity.</p> <p>Some touristic activities cause wildlife disturbance/harm to the TCNR biodiversity.</p> <p>Lack of communication, in particular in the past. Now, in the last couple of years better relations.</p> <p>Tourists: variable origin, Lebanon tourists. Residents, emigrates. International tourists (in particular B&B), now suspended, it is not important compared with the others. There was/is not promotion campaign.</p> <p>Vegetables, meat, fruits, fish and sea food are local. Sewage issue and rubbish (B&B, in front of them). Cleaning process is made by hand, every manager is cleaning their patch. But there are other areas without cleaning activity.</p> <p>TCNR and municipality promoted recycling, but lack of...</p>	<p>SPA-RAC REPORT</p> <p>Tyre municipality: management of TCNR touristic zone (beach) during the summer season.</p> <p>Institutional management (TCNR management team).</p> <p>Ministry of Environment: Authority of reference for legal and eco-friendly exploitation of TCNR's touristic zone by the municipality of Tyre.</p> <p>Operators of the huts at TCNR's touristic zone (pay monthly fees against permits provided by Tyre municipality for 4 months to provide culinary and touristic services at the beach of TCNR).</p> <p>Divers, kayak owners, boat owners (diving, sea tours organization by kayak or boat).</p> <p>Hotels and restaurants' owners and operators.</p> <p>Ministry of Culture & Ministry of Tourism (management of Tyre archaeological sites).</p> <p>Committee representatives of the 49 + 1 huts.</p> <p>Municipality (rubbish management)</p> <p>AirB&B group.</p> <p>Council for reconstruction and development....</p>
Hotels	<p>AirB&B, Hotels and restaurants, Huts (they dismantle them during winter; they operate mid-May/15 October).</p>	<p>DATA CHANGED from the crisis. Values volatile and not predictable.</p> <p>Seasonality of tourism makes it very concentrated during the summer season, exerting high pressure on the city's infrastructures, and the reserve's ecosystems and eventually its biodiversity.</p> <p>Some touristic activities cause wildlife disturbance/harm to the TCNR biodiversity.</p> <p>Lack of communication, in particular in the past. Now, in the last couple of years better relations.</p> <p>Tourists: variable origin, Lebanon tourists. Residents, emigrates. International tourists (in particular B&B), now suspended, it is not important compared with the others. There was/is not promotion campaign.</p> <p>Vegetables, meat, fruits, fish and sea food are local. Sewage issue and rubbish (B&B, in front of them). Cleaning process is made by hand, every manager is cleaning their patch. But there are other areas without cleaning activity.</p> <p>TCNR and municipality promoted recycling, but lack of...</p>	<p>SPA-RAC REPORT</p> <p>Tyre municipality: management of TCNR touristic zone (beach) during the summer season.</p> <p>Institutional management (TCNR management team).</p> <p>Ministry of Environment: Authority of reference for legal and eco-friendly exploitation of TCNR's touristic zone by the municipality of Tyre.</p> <p>Operators of the huts at TCNR's touristic zone (pay monthly fees against permits provided by Tyre municipality for 4 months to provide culinary and touristic services at the beach of TCNR).</p> <p>Divers, kayak owners, boat owners (diving, sea tours organization by kayak or boat).</p> <p>Hotels and restaurants' owners and operators.</p> <p>Ministry of Culture & Ministry of Tourism (management of Tyre archaeological sites).</p> <p>Committee representatives of the 49 + 1 huts.</p> <p>Municipality (rubbish management)</p> <p>AirB&B group.</p> <p>Council for reconstruction and development....</p>

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Restaurants	AirB&B, Hotels and restaurants, Huts (they dismantle them during winter; they operate mid-May/15 October).	<p>DATA CHANGED from the crisis. Values volatile and not predictable.</p> <p>Seasonality of tourism makes it very concentrated during the summer season, exerting high pressure on the city's infrastructures, and the reserve's ecosystems and eventually its biodiversity.</p> <p>Some touristic activities cause wildlife disturbance/harm to the TCNR biodiversity.</p> <p>Lack of communication, in particular in the past. Now, in the last couple of years better relations.</p> <p>Tourists: variable origin, Lebanon tourists. Residents, emigrates. International tourists (in particular B&B), now suspended, it is not important compared with the others. There was/is not promotion campaign.</p> <p>Vegetables, meat, fruits, fish and sea food are local. Sewage issue and rubbish (B&B, in front of them). Cleaning process is made by hand, every manager is cleaning their patch. But there are other areas without cleaning activity.</p> <p>TCNR and municipality promoted recycling, but lack of...</p>	<p>SPA-RAC REPORT</p> <p>Tyre municipality: management of TCNR touristic zone (beach) during the summer season.</p> <p>Institutional management (TCNR management team).</p> <p>Ministry of Environment: Authority of reference for legal and eco-friendly exploitation of TCNR's touristic zone by the municipality of Tyre.</p> <p>Operators of the huts at TCNR's touristic zone (pay monthly fees against permits provided by Tyre municipality for 4 months to provide culinary and touristic services at the beach of TCNR).</p> <p>Divers, kayak owners, boat owners (diving, sea tours organization by kayak or boat).</p> <p>Hotels and restaurants' owners and operators.</p> <p>Ministry of Culture & Ministry of Tourism (management of Tyre archaeological sites).</p> <p>Committee representatives of the 49 + 1 huts.</p> <p>Municipality (rubbish management)</p> <p>AirB&B group.</p> <p>Council for reconstruction and development....</p>
Huts at TCNR	<p>AirB&B, Hotels and restaurants, Huts (they dismantle them during winter; they operate mid-May/15 October).</p> <p>The huts need permit the Min. Env., managed the municipality of Tyre (net profit divided, 45% to TCNR and 55% to Municipality). This was the main income for the Reserve, in 2020 there was Covid and the local currency variability.</p>	<p>DATA CHANGED from the crisis. Values volatile and not predictable.</p> <p>Seasonality of tourism makes it very concentrated during the summer season, exerting high pressure on the city's infrastructures, and the reserve's ecosystems and eventually its biodiversity.</p> <p>Some touristic activities cause wildlife disturbance/harm to the TCNR biodiversity.</p> <p>Lack of communication, in particular in the past. Now, in the last couple of years better relations.</p> <p>Tourists: variable origin, Lebanon tourists. Residents, emigrates. International tourists (in particular B&B), now suspended, it is not important compared with the others. There was/is not promotion campaign.</p> <p>Vegetables, meat, fruits, fish and sea food are local. Sewage issue and rubbish (B&B, in front of them). Cleaning process is made by hand, every manager is cleaning their patch. But there are other areas without cleaning activity.</p> <p>TCNR and municipality promoted recycling, but lack of...</p>	<p>SPA-RAC REPORT</p> <p>Tyre municipality: management of TCNR touristic zone (beach) during the summer season.</p> <p>Institutional management (TCNR management team).</p> <p>Ministry of Environment: Authority of reference for legal and eco-friendly exploitation of TCNR's touristic zone by the municipality of Tyre.</p> <p>Operators of the huts at TCNR's touristic zone (pay monthly fees against permits provided by Tyre municipality for 4 months to provide culinary and touristic services at the beach of TCNR).</p> <p>Divers, kayak owners, boat owners (diving, sea tours organization by kayak or boat).</p> <p>Hotels and restaurants' owners and operators.</p> <p>Ministry of Culture & Ministry of Tourism (management of Tyre archaeological sites).</p> <p>Committee representatives of the 49 + 1 huts.</p> <p>Municipality (rubbish management)</p> <p>AirB&B group.</p> <p>Council for reconstruction and development....</p>

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Beach	<p>TCNR touristic zone, is a public beach, large and beautiful. Sandy beach in Lebanon. Tyre port is also a location for starting diving and sea tours by boats.</p>	<p>DATA CHANGED from the crisis. Values volatile and not predictable.</p> <p>Seasonality of tourism makes it very concentrated during the summer season, exerting high pressure on the city's infrastructures, and the reserve's ecosystems and eventually its biodiversity.</p> <p>Some touristic activities cause wildlife disturbance/harm to the TCNR biodiversity.</p> <p>Lack of communication, in particular in the past. Now, in the last couple of years better relations.</p> <p>Tourists: variable origin, Lebanon tourists. Residents, emigrates. International tourists (in particular B&B), now suspended, it is not important compared with the others.</p> <p>There was/is not promotion campaign.</p> <p>Vegetables, meat, fruits, fish and sea food are local.</p> <p>Sewage issue and rubbish (B&B, in front of them).</p> <p>Cleaning process is made by hand, every manager is cleaning their patch. But there are other areas without cleaning activity.</p> <p>TCNR and municipality promoted recycling, but lack of...</p>	<p>SPA-RAC REPORT</p> <p>Tyre municipality: management of TCNR touristic zone (beach) during the summer season. Institutional management (TCNR management team). Ministry of Environment: Authority of reference for legal and eco-friendly exploitation of TCNR's touristic zone by the municipality of Tyre. Operators of the huts at TCNR's touristic zone (pay monthly fees against permits provided by Tyre municipality for 4 months to provide culinary and touristic services at the beach of TCNR). Divers, kayak owners, boat owners (diving, sea tours organization by kayak or boat). Hotels and restaurants' owners and operators. Ministry of Culture & Ministry of Tourism (management of Tyre archaeological sites). Committee representatives of the 49 + 1 huts. Municipality (rubbish management) AirB&B group. Council for reconstruction and development...</p>
Agriculture	<p>TCNR agricultural zone in Ras El Ain harbouring around 150. Lebanese farmers and 50 Palestinian farmers.</p> <p>170 ha inside of the Reserve is cultivated. Irrigation on the network of Litani water with...</p>		

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Farmers outside of the Reserve	Banana, Citrus, Vegetables and Avocado.	<p>DATA CHANGED from the crisis. Values volatile and not predictable</p> <p>Expensive agriculture products, such as chemicals and seeds.</p> <p>Workforce daily fees is increasing because the unstable current situation of the country.</p> <p>General lack of management, regulation and controls of using chemicals.</p> <p>Lack of import calendar for the products. At the season of certain products, any trader can import cheaper product, unfair competition.</p> <p>Lack of subsidies for the farmers from the Government.</p> <p>Increasing the use of herbicides poisons the soil, so it is sprayed twice a year, depending on the weather.</p> <p>The wastewater is not treated, but rather it is discharged into the sea or into "sanitary sinks."</p> <p>Chemicals washed to the sea.</p> <p>Illegal exploitation of the public lands of TCNR's agricultural zone...</p>	<p>Institutional management (TCNR management team – to initiate dialogue with the farmers of Ras El Ain to start collecting fees for farming the land and raising awareness to adopt more sustainable agricultural practices).</p> <p>Litan authority (management of the water distribution and the ponds of Ras El Ain).</p> <p>Southern Lebanon Farmers syndicate: outside the Reserve. Inside the Reserve there are not associations.</p>
Farmers inside the Reserve (Ras El Ain)	seasonal crops, such as tomatoes, eggplants, cabbages, potatoes, lettuce, cauliflower.	<p>DATA CHANGED from the crisis. Values volatile and not predictable</p> <p>Expensive agriculture products, such as chemicals and seeds.</p> <p>Workforce daily fees is increasing because the unstable current situation of the country.</p> <p>General lack of management, regulation and controls of using chemicals.</p> <p>Lack of import calendar for the products. At the season of certain products, any trader can import cheaper product, unfair competition.</p> <p>Lack of subsidies for the farmers from the Government.</p> <p>Increasing the use of herbicides poisons the soil, so it is sprayed twice a year, depending on the weather.</p> <p>The wastewater is not treated, but rather it is discharged into the sea or into "sanitary sinks."</p> <p>Chemicals washed to the sea.</p> <p>Illegal exploitation of the public lands of TCNR's agricultural zone...</p>	<p>Institutional management (TCNR management team – to initiate dialogue with the farmers of Ras El Ain to start collecting fees for farming the land and raising awareness to adopt more sustainable agricultural practices).</p> <p>Litan authority (management of the water distribution and the ponds of Ras El Ain).</p> <p>Southern Lebanon Farmers syndicate: outside the Reserve. Inside the Reserve there are not associations.</p>

Item	Description	Key management issues	Key stakeholders
Fisheries	<p>Only artisanal fishing is allowed in the marine zone of TCNR.</p> <p>For each season there is a different gear: December-March, big opening nets (70 mm). April-June: smaller opening net (35 mm). Targeting the migrating fish, like Tuna, "Balamida", (...), and other species.</p> <p>During the last years they noticed the decreasing trend in the amount.</p> <p>June-August: local, resident fish. This is the most important fishing period, because it is the reproduction period and there is a rocky area where the fish lay eggs. This is a crucial period because it is a key moment for populations' recruitment.</p> <p>Mid Sept-December: smaller nets (20mm).</p> <p>Two zone: estuary of the springs and south zone of are very rich in fish abundance and species richness.</p> <p>170 small boats with two fishermen (340 tot). Practising only 200 now, previously 400 fishermen. The sector is neither organised nor supported by authorities.</p> <p>Invasive fishes are detected by fishermen as: Lyon fish (invasive but edible), Nasrallah fish (brown color and poisonous), the Gulf Sultan fish (edible and they benefit from it). Balamida and Sardine decreased, the Sultan local fish disappeared, and the Gulf Sultan fish is detected (edible and benefit from it).</p>	<p>DATA CHANGED from the crisis. Values volatile and not predictable</p> <p>Illegal fishing includes fishing during the night (putting nets during the night).</p> <p>Litter (plastic bags and bottles), domestic waste: nets are damaged.</p> <p>Patrol of Municipality of Tyre reduced 80% dynamite use. Nowadays the poaching with dynamite is used in the 20% of the cases compared than before.</p> <p>Some illegal and non-sustainable fishing activities are still exerted in the marine zone facing Rasheedeh camp for Palestinian refugees, and to a lesser extent, by some Lebanese fishermen across the marine zone of TCNR.</p> <p>Some fishermen still hurt/kill/bycatch sea turtles that they find stuck on their fishing nets because they ruin the nets.</p> <p>The law exists but it is not applied. Law enforcement should be reinforced, and the patrol forces should be provided with more tools and resources (only one Zodiac boat until now).</p> <p>Suggestion: in the calendar should be added a no-fishing period between mid-June/mid September, to mitigate conflicts and to give the opportunity of the fish stock to increase and grow in dimension and in number.</p> <p>Social aspects: Min. Agriculture should have given social security, tools and nets but it didn't provide anything. No left on their own.</p> <p>No fishing competition from abroad.</p> <p>The most vulnerable social group: since 2006 the only social group without social support and no income when the weather is bad or during reproduction season and they depend by family alternative incomes. Paradoxically the...</p>	<p>Ministry of Agriculture (Authority responsible of issuing fishing permits and controlling fishing operations)</p> <p>Lebanese Army (controls illegal fishing, especially dynamite fishing).</p> <p>Cooperative of Tyre fishermen.</p> <p>Institutional management. TCNR & IUCN & MedPAN & ENI CBCMED program (projects and programs of cooperation with and support to fishermen, to adopt and exert more sustainable fishing and less harmful practices to the reserve's marine wildlife, especially vulnerable and threatened species of high value).</p>