



'Uruq Bani Ma'arid Protected Area Management Plan¹



2021 – 2023

¹ This approach adopted in this management plan follows the abbreviated form of the management planning process which is based on IUCN Protected Areas Planning Guidelines (Thomas, Lee and Middleton, Julie, (2003). *Guidelines for Management Planning of Protected Areas*. IUCN Gland, Switzerland and Cambridge, UK. ix + 79pp), and was chosen to act as a 'stop-gap' measure intended to guide managers on appropriate and acceptable activities until the nomination process of the protected area for the World Heritage Status under UNESCO is concluded in 2023.

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1. Site Description

1.1. General Information

1.1.1. Name of the Protected Area: 'Uruq Bani Ma'arid Protected Area (UBM).

1.1.2. Area (ha):

No	Area	Hectares (ha)	Square Kilometers (km ²)
1-	Protected Area	1,276,500 ha	12,765 km ²
2-	Buffer Zone	80,600 ha	806 km ²
3-	Total	1,357,100 ha	13,571 km ²

1.1.3. Legal Status: The protected area completely coincides with the 'Uruq Bani Ma'arid Protected Area which was proclaimed (designated) as a 'protected area' by the Cabinet of Ministers Decision No 77 dated 02/06/1417H (15/10/1996G) under the Protected Areas Law (Royal Decree No M/12 dated 26/10/1415H).

1.1.4. Land Ownership: There are no permanent human settlements inside the boundaries of the protected area. The area is totally state-owned and there are no private land claims in any of its areas.

1.1.5. Center Point Coordinates (DMS): 45°35'54"E 19°21'50"N.

1.1.6. Elevation (Meters): From 640 meters above sea level to 1,100 meters above sea level.

1.1.7. Other Designations:

1.1.7.1. Important Plant Area

1.1.7.2. Nominated for world heritage status under of UNESCO under criteria vii, ix, and x.

1.1.8. General Location Map in KSA.

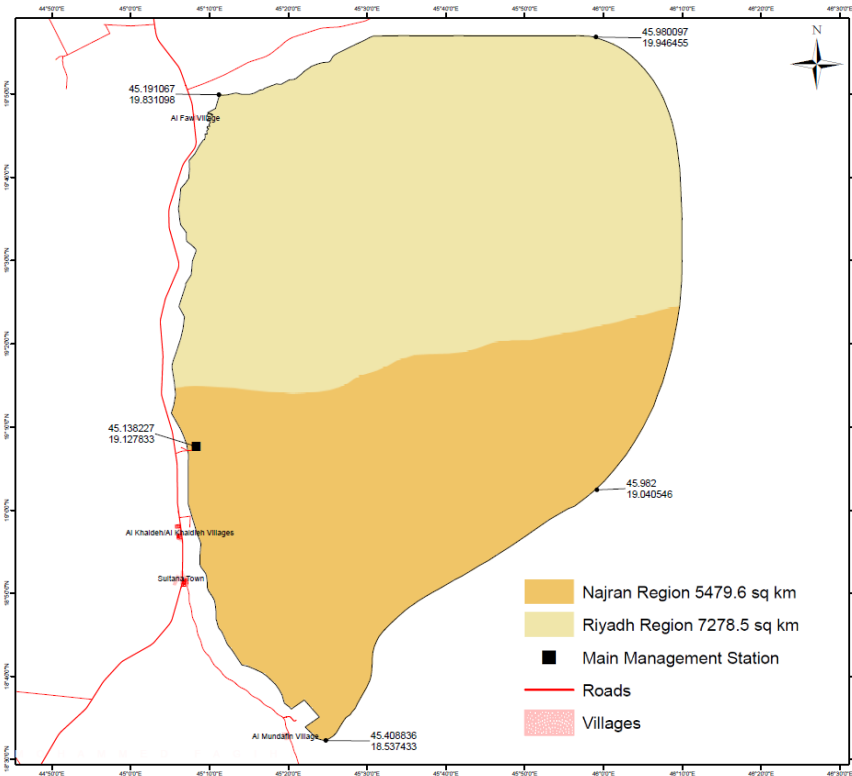


1.1.9. Administrative Regions:

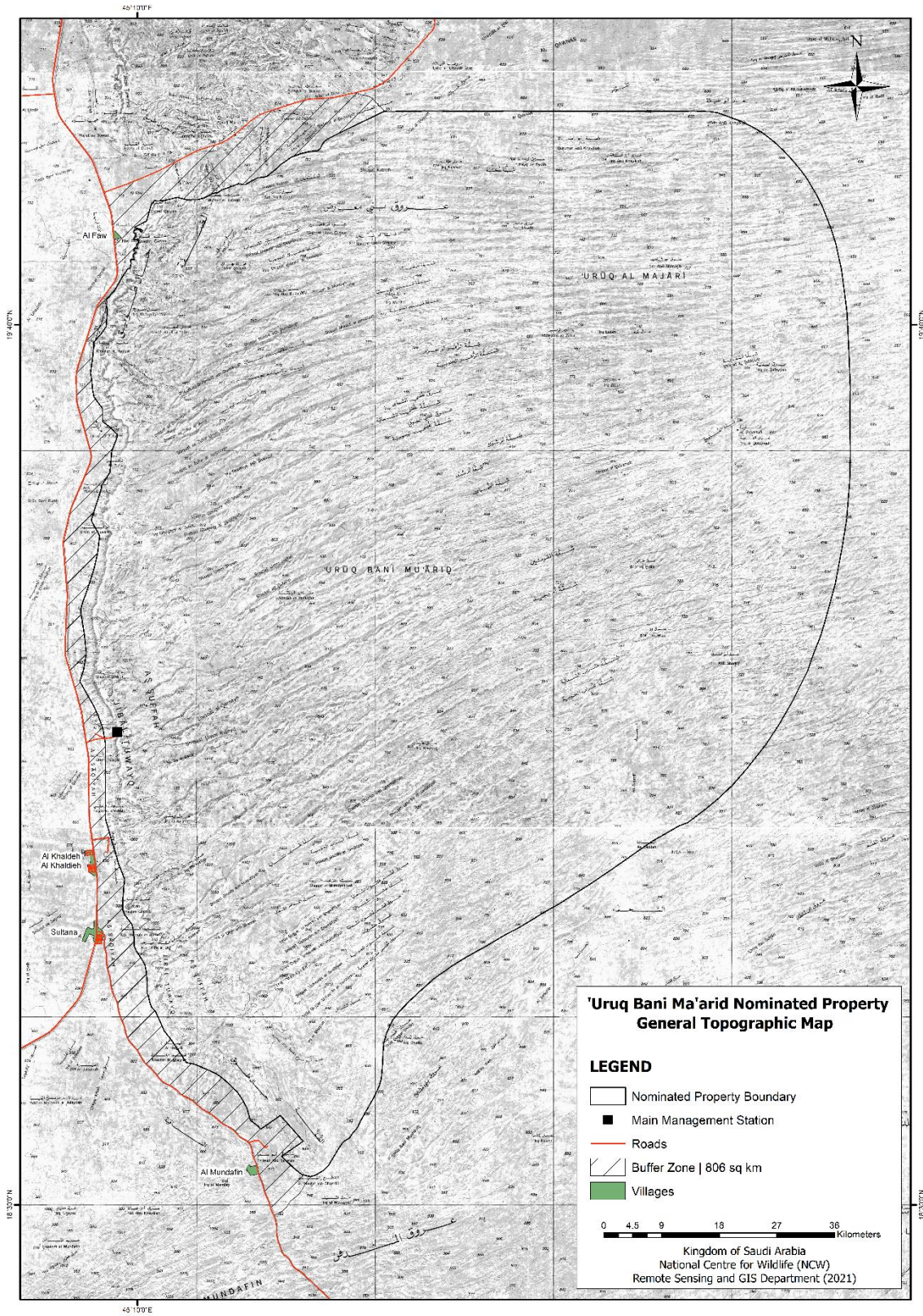
1.1.9.1. Al Riyadh Region

1.1.9.2. Najran Region

1.1.9.3. Administrative Boundaries Map:

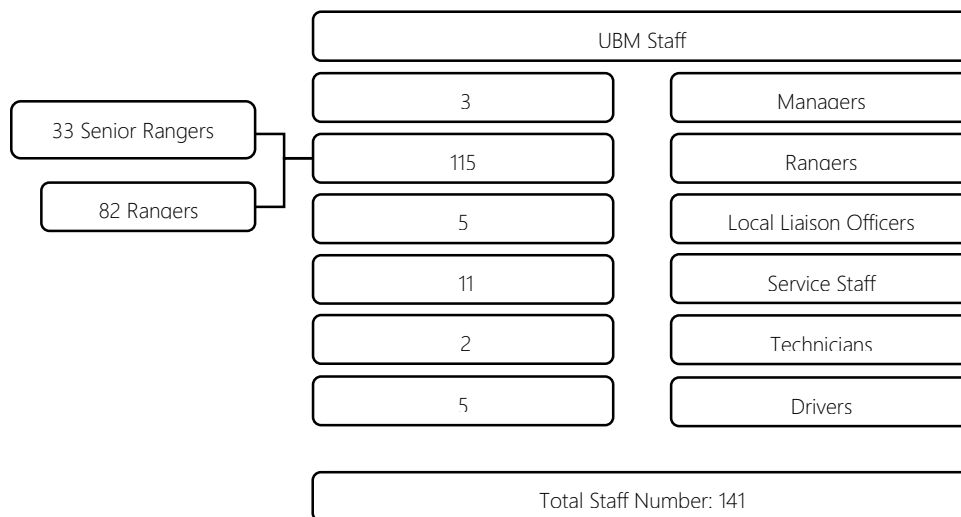


1.1.10 Topographic Map



1.2. Administrative Information

1.2.1. Staff: 'Uruq Bani Ma'arid employs 141 staff members in six categories. The figure below summarizes the UBM personnel structure as of August 2021.



1.2.2. Management Facilities:

1.2.2.1. Central Management Station

1.2.2.2. 8 field rangers' stations

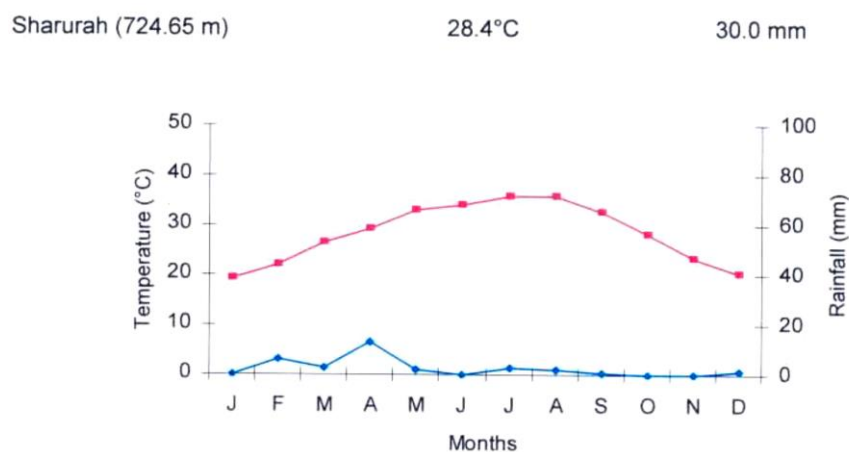
Map of the Management and Rangers Stations



- 1.2.3. Vehicles and Equipment: There are 23 four-wheel drive vehicles operating in the protected area, mostly used for patrolling, monitoring, and supporting research activities. In addition, 'Uruq Bani Ma'arid has two water tanks and one loader for small-scale maintenance.
- 1.2.4. Annual Budget – 2021: 'Uruq Bani Ma'arid is fully financed by the Government of Saudi Arabia. There are three main budget categories: 1) personnel budget of 12 million SAR per year, 2) operational budget around 1.5 million SAR per year, and 3) conservation projects budget of around 10.5 million SAR for the years 2021-2022.

1.3. Physical Environment

- 1.3.1. Climate: The climate of 'Uruq Bani Ma'arid and Ar-Rub' Al-Khali is hyper-arid. There is an annual average of only 15–35mm of rain which falls erratically in the winter and spring. The area is seasonally affected by hot, suffocating winds, known as Simoom, or 'poison' (Seal, 2017). Summer months are intensely hot with a daily maximum of over 45°C. Winters can be relatively cool with maximum temperatures of about 25°C, declining to 10°C and rarely below 0°C at night.



- 1.3.2. Geology: 'Uruq Bani Ma'arid lies within the Quaternary Aeolian Sands Physiographic Region on the western edge of the great sand desert of Ar-Rub' al-Khali, overlying the cuesta of the Tuwayq Escarpment limestone (Hall et al. 2011). The southernmost extension of the limestone plateau of the Tuwayq Escarpment runs along the western edge of 'Uruq Bani Ma'arid, rising 1,062m above sea level and then sloping gently to the east, where the extensive sands of the Ar-Rub' Al-Khali are formed. Within the Tuwayq Plateau, numerous large wadis drain eastward. The majority of 'Uruq Bani Ma'arid's landscape is formed by a linear system of parallel red sand dunes ('irq or 'uruq) that lie in a northeast-southwest orientation. Most of these dunes are more than one-kilometer-wide and are up to 170 meters high, sometimes merging to form mobile dunes at the edge of the Escarpment. Gravel and stony plains (shiqqah or shiqaq) occur in the areas between the dunes and are interspersed with sand belts for the first 30 to 40 km, after which they are replaced by sand, thus producing a continuous undulating sand mass (Strauss, 2006, Hall et al., 2011).

- 1.3.3. Soils: Most of 'Uruq Bani Ma'arid as characterized by Torripsamments (wind-borne sands on dunes and sand sheets) and Torriorthents (dry or salty Entisols of arid regions); high dunes with sandy-skeletal composition, and very shallow to shallow soils in inter-dunal corridors. The eastern parts of the reserve are characterized by Torripsamments and dunes more than 10 meters high. The escarpment of Al-'Arid to the west is characterized by Torriorthents and Calciorthids; rock outcrop of escarpments with areas of Calciorthids and Torriorthents, and rock outcrop of loamy and loamy-skeletal shallow soils and areas of rock. Below the escarpment to the west are loamy-skeletal deep Camborthids.
- 1.3.4. Water Resources: The area has no perennial water sources. Short ephemeral drainages run eastward from the lip of the escarpment into some of the inter-dunal corridors, where they disappear into the sands, and in the far northwest draining occurs northward into Sha'ib Al Faw. West of the escarpment, very short ephemeral streams run westward. At various locations, such as the shallow well of Mishash al-'Ayid in Shiqqat Munadi ash-Shamaliyah, water collects between the porous sand and the limestone bedrock.

1.4. Biodiversity

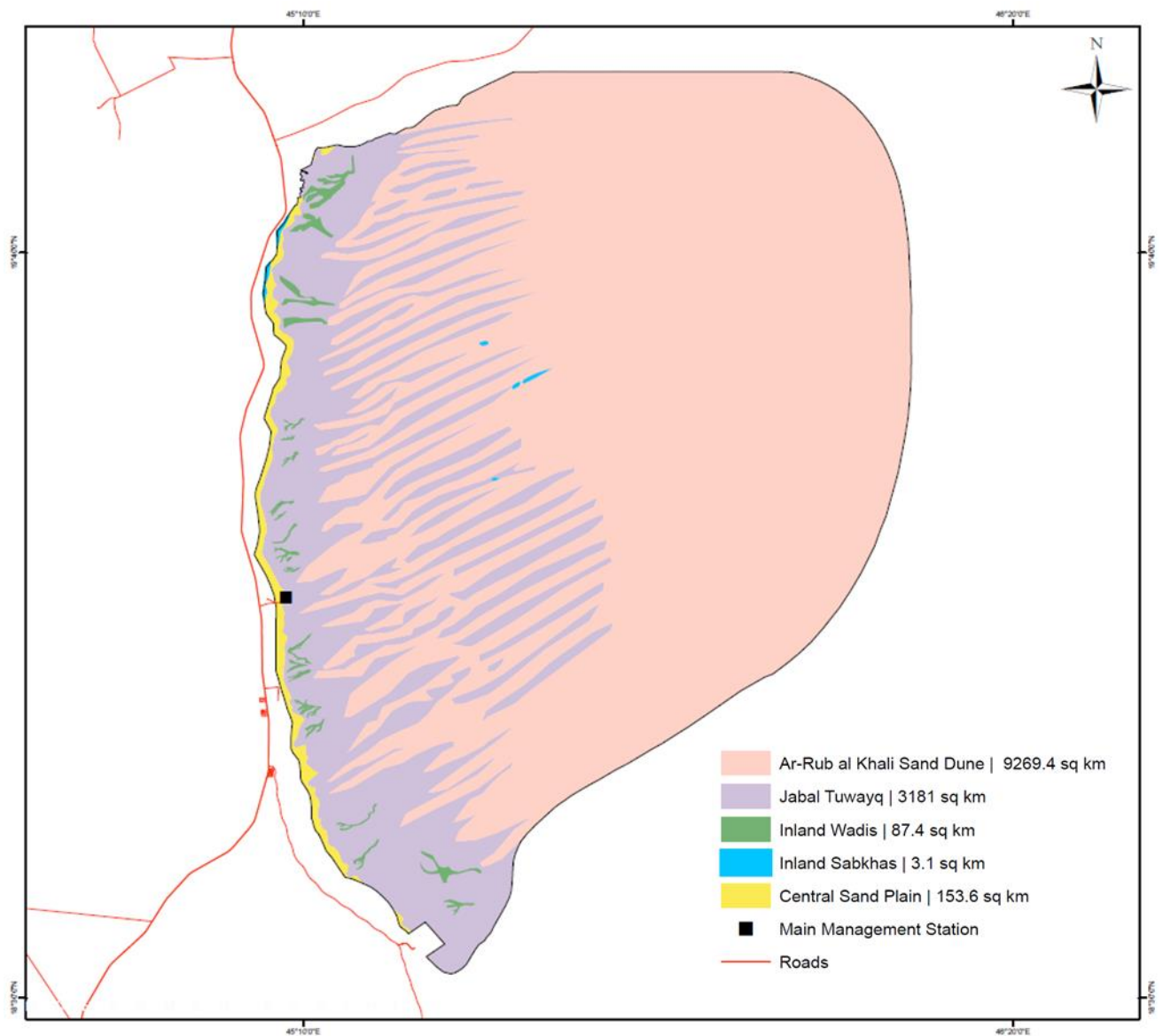
1.4.1. Bioregions

- 1.4.1.1. The following matrix summarizes the bioregional construct of Uruq Bani Ma'arid along with their key distinctive characteristics:

Physiographic Region Bioregion Biotope	Altitude meters asl	Geology Topography	Rainfall Climatic Factors	Soils	Vegetation structure	Plant assemblages (dominant taxa; distinctive taxa in brackets)	Area in UBM sq. km
1. Central Arabian Cuesta							
1.1. Central Sand Plains	720-875	sandstone & limestone plains & buttes	20-30mm	Calciorthids Torripsamments Gypsiorthids Torriorthents	very open xeromorphic thorn shrubland & dwarf-shrubland	<i>Haloxylon salicornicum</i> , <i>Rhanterium epapposum</i> , <i>Vachellia tortilis</i> , <i>Panicum turgidum</i> , <i>Lasiurus scindicus</i> , <i>Pulicaria crispa</i> , <i>Neurada procumbens</i> , <i>Moltkiopsis ciliata</i> , <i>Pennisetum divisum</i>	153.6 sq. km
1.2. Jabal Tuwayq	600-1070	dissected limestone cuesta	20-30mm	Torriorthents Rock	open xeromorphic thorn woodland & dwarf-shrubland	<i>Vachellia tortilis</i> , <i>V. oerfota</i> , <i>Lycium shawii</i> , <i>Ochradenus baccatus</i> , <i>Anastatica hierochuntica</i> , <i>Tripogon</i> spp., <i>Oropetium</i> spp.	3,181 sq. km
2. Windblown Sands							
2.1. Ar-Rub' al-Khali Sands	650-1199	complex longitudinal, linear, & barchanoid sand dunes	20-30mm	Torripsamments Torriorthents Gypsiorthids	very open xeromorphic dwarf-shrubland	<i>Calligonum crinitum</i> , <i>Cornulaca arabica</i> , <i>Tribulus macropterus</i> var. <i>arabicus</i> , <i>Cyperus macrorrhizus</i> , <i>Limeum arabicum</i> , (<i>Haloxylon persicum</i>).	9,269.4 sq. km

3. Terrestrial Wetlands								
3.1.	Inland Wadis	750-1050	gullies incised in the limestone plateau	20-30mm	Torriorthents Calciorthids	open xeromorphic woodland & shrubland	<i>Tamarix</i> spp., <i>Calotropis procera</i> , <i>Rhazya stricta</i> .	87.4 sq. km
3.2.	Inland Sabkhahs	720-750	salt flats in blind drainages	20-30mm	Salorthids Udipsamments	barren with halophytic dwarf-shrubland	<i>Suaeda</i> spp., <i>Seidlitzia rosmarinus</i> , <i>Zygophyllum</i> spp., <i>Anabasis articulata</i> , <i>A. setifera</i> , <i>Atriplex leucoclada</i> , <i>Aeluropus lagopoides</i> ,	3.1 sq. km

1.4.1.2. Map of Bioregions



1.4.2. Flora

The flora of the protected area is characterized by elements of both the tropical and holarctic elements represented by two subzones of the Saharo-Sindian regional zone: The Arabian regional subzone and the Nubo-Sindian local center of endemism (White and Leonard, 1991), with a number of highly adapted plant species including several endemic species and subspecies.

The limestone plateau is largely barren but the incised wadis support a diverse plant community dominated by *Vachellia tortilis* with other *Vachellia spp.*, *Maerua crassifolia*, *Leptadenia pyrotechnica*, and a dwarf shrub community of several perennial and annual herbs and grasses. Small stands of *Ziziphus spina-christi* var. *divaricata* occur where sufficient groundwater collects on the wadi floors, and there are unusual stands of *Moringa peregrina* and *Commiphora myrrha*. Stands of *Haloxylon persicum* are found on the western edge of the sands in Wadi Ghudayy. Perennial grasses such as *Panicum turgidum* and *Stipagrostis spp.*, and herbs such as *Fagonia indica*, and dwarf shrubs, including *Haloxylon salicornicum*, *Dipterygium glaucum*, and the endemic *Limeum arabicum*, grow on the limestone plateau and on gravels in the inter-dune corridors.

The plant communities of the sand dunes are typical of Ar-Rub' Al-Khali. The endemic woody shrub, *Calligonum crinitum* ssp. *arabicum* occupies the unstable sand habitats on the crests of the high dunes, producing a community of very widely spaced shrubs. *Cornulaca monacantha*, also endemic, occurs mainly on the lower slopes of the dunes. In sheltered sites and after rain, *Tribulus arabicus* and *Cyperus macrorrhizus* commonly occur as companion species in all communities of the sands, and over large areas these species, together or alone, produce a sparse herbaceous community. Both species are endemics, and are favored as food by both domestic livestock and wild ungulates, including Arabian Oryx and Arabian Sand Gazelle. The perennial grasses *Stipagrostis drarii* and *Centropodia fragilis* grow on the dunes of 'Uruq Bani Ma'arid, unlike in other parts of Ar-Rub' Al-Khali. These and other grasses, such as *Panicum turgidum*, *Lasiurus scindicus*, *Centropodia spp.* and *Stipagrostis spp.* are important forage for the Arabian Oryx.

The Important Plant Area Assessment

As stated above, 'Uruq Bani Ma'arid is an important site for wild plant conservation. Using the Important Plant Area (IPA) criteria, which have been adapted for the Arabian Peninsula (Al-Abbasi et al., 2010) the protected area qualifies as an IPA under criteria A and B.

Criterion A (4): National endemic, near endemic, regional endemic and/or regional range-restricted taxa. One plant variety endemic to Saudi Arabia, *Ziziphus spina-christi* var. *divaricata*, two plant species endemic to the Arabian Peninsula, *Limeum arabicum* and *Tribulus arabicus*, one species near endemic to the Arabian Peninsula (also in Kuwait), *Farsetia burtoniae*, and nine plant species endemic to the region (Arabian Peninsula and East Africa), *Senegalia hamulosa*, *Commiphora myrrha*, *Indigofera spinosa*, *Iphiaea scabra*, *Moretta parviflora*, *Moringa peregrina*, *Pulicaria jaubertii*, *Pulicaria schimperi*, *Stipagrostis drarii*.

Criterion B: B – The site has an exceptionally rich flora in a regional context in relation to its biogeographic zone with around 120 plant species recoded in the site.

1.4.3. Fauna

1.4.3.1. Mammals: Internationally, 'Uruq Bani Ma'arid is the most important site for the conservation of free-ranging Arabian Oryx and holds the largest extant population of Arabian Sand Gazelle, and the second largest population of Arabian Mountain Gazelle in Arabia. The area is within the former natural range of these three species, populations of which have been successfully re-established at the site since the first reintroductions in 1995. The reserve also provides important habitat for Sand Cat, Rueppell's Sand Fox, and Cape Hare. Other species recorded in the reserve include Arabian Red Fox, Wild Cat, Desert Hedgehog, Cheesman's Gerbil, and Lesser Jerboa.

A recent ecological assessment of 'Uruq Bani Ma'arid used IUCN categories for national and global assessment to evaluate the species and assigned criteria to all mammal species in Saudi Arabia, and produced the Red List of Mammals of Saudi Arabia (Islam et al., 2018). Out of 109 species of mammals, 23 are associated with 'Uruq Bani Ma'arid. The assessment concluded that the majority of the species (65%) are Least Concern, followed by 22% listed as Vulnerable, and 12% listed as Near Threatened. The below table summarizes key mammal species along with their preliminary IUCN Red List categorization:

No	Species Name	National/Regional/Global IUCN RL
1-	Arabian Oryx <i>Oryx leucoryx</i>	VU/VU/VU
2-	Arabian Sand Gazelle <i>Gazella marica</i>	VU/VU/VU
3-	Arabian Mountain Gazelle <i>Gazella arabica</i>	VU/VU/VU
4-	Arabian Sand Cat <i>Felis margarita harrisoni</i>	VU/LC/LC
5-	Honey Badger <i>Mellivora capensis</i>	NT/LC/LC
6-	Cape Hare <i>Lepus capensis</i>	NT/LC/LC

1.4.3.2. Birds: The presence and documentation of a significant breeding population of Lappet-faced Vulture *Torgos tracheliotus*, and breeding Short-toed Eagle *Circaetus gallicus* is also very important to the site. These are large, slow-breeding species, potentially vulnerable, and of regional as well as national conservation significance. Asian Houbara Bustards *Chlamydotis macqueenii* recorded in 'Uruq Bani Ma'arid are probably rare spring migrants. Some rare or endangered species are at least seasonally present, such as Sooty Falcon Falco concolor, Corncrake Crex, and Basra Reed Warbler *Acrocephalus griseldis*. Other species include the Hooded Wheatear *Oenanthe monacha*, Dunn's Lark *Eremalauda dunnii*, and Great Reed Warbler *Acrocephalus arundinaceus*. The table below lists the most important bird species (36 species in 18 families). The table also includes the IUCN Red List Assessment for each species at the global and regional level:

No	Family	Species No	Species	Status in the protected area	IUCN Red List		Total records 2021
					Global	Regional	
1	Accipitridae	1	Pallid Harrier <i>Circus macrourus</i>	PM	NT	NT	3
		2	Western Marsh Harrier <i>Circus aeruginosus</i>	WV/PM	LC	LC	1
		3	Short-toed Snake-eagle <i>Circaetus gallicus</i>	BR/WV/PM	LC	LC	1
		4	Egyptian Vulture <i>Neophron percnopterus</i>	BR/WV/PM	EN	VU	2
		5	Lappet-faced Vulture <i>Torgos tracheliotus</i>	BR, SB	EN	EN	1
		6	Long-legged Buzzard <i>Buteo rufinus</i>	BR/WV/PM	LC	LC	1
2	Columbidae	7	Rock Dove <i>Columba livia</i>	BR	LC	LC	37
		8	Eurasian Collared Dove <i>Streptopelia decaocto</i>	BR	LC	LC	5
		9	Namaqua Dove <i>Oena capensis</i>	BR, SB	LC	LC	6
3	Falconidae	10	Common Kestrel <i>Falco tinnunculus</i>	BR/WV/PM	LC	LC	7
4	Phasianidae	11	Sand Partridge <i>Ammoperdix heyi</i>	BR	LC	LC	12
5	Acrocephalidae	12	Upcher's Warbler <i>Hippolais languida</i>	WV/PM	LC	LC	4
6	Alaudidae	13	Desert Lark <i>Ammomanes deserti</i>	BR	LC	LC	31
		14	Greater Hoopoe Lark <i>Alaemon alaudipes</i>	BR	LC	LC	41
		15	Greater Short-toed Lark <i>Calandrella brachydactyla</i>	BR/WV/PM	LC	LC	10
7	Crovidae	16	Brown-necked Raven <i>Corvus ruficollis</i>	BR	LC	LC	27
8	Fringillidae	17	Trumpeter Finch <i>Bucanetes githagineus</i>	BR	LC	LC	14
9	Hirundinidae	18	Barn Swallow <i>Hirundo rustica</i>	WV/PM	LC	LC	2
		19	Eurasian Crag Martin <i>Ptyonoprogne rupestris</i>	WV/PM	LC	LC	2
10	Laniidae	20	Great Grey Shrike <i>Lanius excubitor</i>	BR/WV/PM	LC	LC	25
		21	Isabelline Shrike <i>Lanius isabellinus</i>	WV/PM	LC	LC	3
11	Muscicapidae	22	Blackstart	BR	LC	LC	1

			<i>Oenanthe melanura</i>				
		23	Desert Wheatear <i>Oenanthe deserti</i>	WV/PM	LC	LC	10
		24	Hooded Wheatear <i>Oenanthe monacha</i>	BR	LC	LC	4
		25	Isabelline Wheatear <i>Oenanthe isabelline</i>	WV/PM	LC	LC	4
		26	White-crowned Wheatear <i>Oenanthe leucopyga</i>	BR	LC	LC	2
		27	Northern Wheatear <i>Oenanthe oenanthe</i>	WV/PM	LC	LC	1
		28	Black Scrub Robin <i>Cercotrichas podobe</i>	BR	LC	LC	1
12	Passeridae	29	House Sparrow <i>Passer domesticus</i>	BR	LC	LC	5
13	Phylloscopidae	30	Willow Warbler <i>Phylloscopus trochilus</i>	WV/PM	LC	LC	3
14	Sylviidae	31	Asian Desert Warbler <i>Sylvia nana</i>	WV/PM	LC	LC	1
		32	Common Whitethroat <i>Sylvia communis</i>	WV/PM	LC	LC	2
15	Pteroclididae	33	Chestnut-bellied Sandgrouse <i>Pterocles exustus</i>	BR	LC	LC	10
16	Strigidae	34	Little Owl <i>Athene noctua</i>	BR	LC	LC	1
17	Upupidae	35	Eurasian Hoopoe <i>Upupa epops</i>	SB	LC	LC	1
18	Ardeidae	36	Cattle Egret <i>Bubulcus ibis</i>	BR/WV/PM	LC	LC	4

E: Extinct, BR: Breeding, FB: Former Breeder, OB: Occasional Breeder, PM: Passage Migrant, SB: Summer Visitor and Breeder, SV: Summer Visitor, NB: Non-breeder, R: Resident, T: Transit (present all year with no breeding), WV: Winter Visitor, V: Vagrant,?: status unknown.

1.4.3.3. Reptiles: The reptiles of 'Uruq Bani Ma'arid had not been studied systematically until the NCW spring 2021 survey, when a rapid assessment was undertaken (Mutairi et al., 2021). According to the investigation and historical records, the protected area hosts the following interesting species of lizards and snakes: Desert Monitor *Varanus griseus*, Egyptian Spiny-tailed Lizard *Uromastix aegyptia*, possibly the Ornate Mastigure *U. ornata*, Arabian Toadhead Agama *Phrynocephalus arabicus*, Arabian Sand Skink *Scincus mitranus*, Saudi Fringe-fingered Lizard *Acanthodactylus gongrorhynchatus*, Arabian Sand Gecko *Trigonodactylus arabicus*, Curve-toed Gecko *Cyrtodactylus sp.*, Arabian Sand Boa *Eryx jayakari*, and Arabian Horned Viper *Cerastes gasparettii*. The Egyptian Spiny-tailed Lizard *Uromastix aegyptia* is considered to be of particular importance, as it has been assessed VU in the IUCN Red List. The presence of the Ornate Mastigure in 'Uruq Bani Ma'arid is very likely, even though there is no recently confirmed record. The protected area

also represents a key area for the natural distribution of several important reptile species endemic to Arabia, namely, Slevin’s Sand Gecko *Stenodactylus slevini*, Arabian Sand Gecko *Trigonodactylus arabicus*, Arnold’s Fringe-fingered Lizard *Acanthodactylus ophiodurus*, Schmidt’s Fringe-fingered Lizard *Acanthodactylus schmidtii*, and Arabian Sand Skink *Scincus mitranus*. The Arabian Sand Skink is of particular conservation interest because it is subjected to a high level of illegal collection due to claimed benefits in local traditional medicine as a treatment for diabetes (Zahrany pers. comm., 2021), (18 species belonging to 10 families):

No	Family	Sp. No	Species	IUCN Red List		
				Global	National	Regional
1	<i>Scincidae</i>	1	Arabian Sand Skink <i>Scincus mitranus</i>	LC	LC	LC
2	<i>Gekkonidae</i>	2	Dune Sand Gecko <i>Stenodactylus doriae</i>	LC	LC	LC
		3	Arabian Sand Gecko <i>Trigonodactylus arabicus</i>	LC	LC	LC
		4	Slevin’s Sand Gecko <i>Stenodactylus slevini</i>	LC	LC	LC
		5	Arabian Rock Gecko <i>Bunopus tuberculatus</i>	LC	LC	LC
3	<i>Sphaerodactylidae</i>	6	<i>Pristurus sp.</i>	?	?	?
4	<i>Phyllodactylidae</i>	7	Fan-footed Gecko <i>Ptyodactylus hasselquistii</i>	LC	LC	LC
5	<i>Agamidae</i>	8	Egyptian Spiny-tailed Lizard <i>Uromastyx aegyptia</i>	VU	VU	VU
		9	Arabian Toadhead Agama <i>Phrynocephalus arabicus</i>	LC	LC	LC
		10	Sinai Agama <i>Pseudotrapelus sinaitus</i>	LC	LC	LC
6	<i>Varanidae</i>	11	Desert Monitor <i>Varanus griseus</i>	LC	LC	LC
7	<i>Lacertidae</i>	12	Bosk’s Fringe-fingered Lizard <i>Acanthodactylus boskianus</i>	LC	LC	LC
		13	Arnold’s Fringe-fingered Lizard <i>Acanthodactylus ophiodurus</i>	LC	LC	LC
		14	Schmidt’s Fringe-fingered Lizard <i>Acanthodactylus schmidtii</i>	LC	LC	LC
		15	<i>Mesalina sp.</i>	?	?	?
8	<i>Viperidae</i>	16	Arabian Horned Viper <i>Cerastes gasperettii</i>	LC	LC	LC
9	<i>Colubridae</i>	17	Braid Snake <i>Platyceps rhodorachis</i>	?	?	?
10	<i>Boidae</i>	18	Arabian Sand Boa <i>Eryx jayakari</i>	LC	LC	LC

1.4.3.4. Invertebrates: A baseline survey was conducted for invertebrates of 'Uruq Bani Ma'arid, and an ongoing assessment has thus far identified 382 species in 96 families and 14 orders. All recorded specimens have been prepared, mounted, and stored in the King Saud University Department of Arthropods. An assessment of the conservation values of invertebrates is currently being conducted and results will be available by the end of 2021. To date, three species have been identified to be potentially new to science and are currently being described by researchers. This highlights the importance of continuing research on insects in the protected area, as it may reveal important scientific findings. A seasonal research program is proposed to extend for at least one full year, anticipated to complete the invertebrate check list and assess the species' conservation significance, status, and trends.

The following table summarizes the list of insect species, arranged by order:

No	Order name	No of Families	No of species
1	Coleoptera	19	88
2	Diptera	17	41
3	Hemiptera	13	73
4	Hymenoptera	20	112
5	Isoptera	1	1
6	Lepidoptera	11	32
7	Mantodea	2	3
8	Neuroptera	3	10
9	Orthoptera	4	6
10	Phasmatodea	1	1
11	Phthiraptera	1	1
12	Siphonaptera	1	1
13	Thysanoptera	2	12
14	Zygentoma (Thysanura)	1	1
Total		96	382

1.5. Aesthetic Values

'Uruq Bani Ma'arid is an iconic hyper-arid sand desert representing the largest sand sea on Earth, Ar-Rub' al-Khali, the only major tropical sand desert in Asia, and the place where the sands meet the escarpment forming an extraordinary spectrum of juxtaposed contrasts and fusions of forms and colors. 'Uruq Bani Ma'arid is an ecological refuge for iconic wildlife of the desert. It is the only place on earth where the Arabian Oryx roams freely in its natural habitat, the place where the last record of the Arabian Oryx was made before its extinction from the wild, and the destination for its reintroduction to its natural habitats.

The protected area offers a world-class panorama of the windblown sands of the Ar-Rub' al-Khali desert, with some of the world's highest longitudinal dune fields, inter-dunal corridors, eastward-flowing densely vegetated wadis, the Tuwayq Escarpment engulfed by westward flowing sands, and low sand

plains to the west of the escarpment. A wide spectrum of color harmonies derives from the resonance of contrasting hues of the sand grains in the ripples that cover the dunes. A true portrait of the desert where the light-colored Arabian Oryx (or *wudayhi*, meaning clear in Arabic) are conspicuous against their darker backgrounds.

1.6. Associated Cultural Values

At its northwestern edge, 'Uruq Bani Ma'arid is bordered by the historical village of Al Faw, an ancient trading city which is believed to be the capital of the first Kingdom of Kindah. The archeological site reveals a variety of features, such residential areas, roads, cemeteries, wells, equipment, and tools. Considering the extreme desolation of the Empty Quarter, 'Uruq Bani Ma'arid area is assumed to have been a vital backdrop for the people residing at Al Faw as the source of their hunting grounds and firewood. The archeological site of Al Faw is currently on Saudi Arabia's tentative list for Cultural World Heritage, thus representing a potential for nature-culture linkage in the future.

1.7. Land and Resource Use

1.7.1. Human Settlements

There are no permanent settlements in the protected area. The only permanent use of the area is by the NCW protected area management, represented by 141 staff members working in 10 management/ranger stations. As for the buffer zone, there are a total of seven small towns and villages present near the boundaries of the protected area, but none of them immediately border the area. The table below summarizes the number of villages and their inhabitants residing permanently in the buffer zone of the protected area.

No	Region	Village name	No of inhabitants
1	Riyadh	Al Zahar Village	20
2		Al Faw Village	10
3		Al Hissi Village	50
4	Najran	Al Mindifin Village	120
5		Sultana Town	800
6		Al Khaldieh Village	400
7		Al Khaldeh Village	200
Total number of inhabitants in the buffer zone			1,600

1.7.2. Camel Grazing

Camel herding represents the main activity taking place within the sustainable resource use zone of the protected area. There is very limited grazing of smaller animals in the area, including goats and sheep. Camel grazing occurs mainly during the winter and spring seasons, and is highly dependent on availability of rain and pasture. There are around 100 households, each with 25-40 animals, who use part of the protected area as grazing grounds for a period ranging from a minimum of one to a

maximum of four months yearly, starting from around November and extending to March. The total number of camels permitted into UBM ranges from 2,500 to 4,000. Grazing activity is restricted to the resource use zone/area and is monitored very closely by the protected area management team during the grazing season. Most camel owners come from the nearby villages that border 'Uruq Bani Ma'arid. Camel herding in 'Uruq Bani Ma'arid is much more than an economic activity associated with local sources of income. It represents a deeply rooted cultural and social activity, which has been inherited through generations. Many of the camel owners do not make a real profit from the activity but still retain it for social status and as a cultural hobby.

1.7.3. Farming

There are no farming activities inside the protected area. The only agricultural activity with direct interaction with 'Uruq Bani Ma'arid is located in the buffer zone on the western boundary near Al Zahar Village (see above under human settlements). The farming activities are undertaken by one family from the Dawasir tribe, who claim ownership rights over an area of approximately 50 km². Most of the claimed area is not farmed and the estimated area of active farming is well below 20% of the claimed lands. The farms existed well before the establishment of the protected area in 1996. The farms include five agricultural irrigation units each of around 1 km², supplied by five deep-water wells (around 400 m deep) provided by a government sponsored agriculture development project. Cereals (wheat) and fodder plants (clover and maize) are the main crops produced, in addition to a few stands of date palms. There are two small prefabricated buildings near the irrigation units installed for workers' accommodation and equipment and materials storage.

1.7.4. Wildlife Hunting

Wildlife hunting is currently not considered to be a serious threat to the integrity of the protected area. Hunting is banned for all species in the area, and is under a high degree of control in the entire wilderness area of the protected area. Occasional violations of the hunting ban do occur, however, in the sustainable resource use zone and in the areas surrounding the outer boundaries of the protected area. A recent hunting regulation bans wildlife hunting in all of Saudi Arabia, and a national law enforcement force has been established for that purpose.

1.7.5. Wood Cutting

Wood cutting does not represent a significant threat to the protected area. Wood cutting is fully banned and very few violations have been recorded during the last 10 years. When they do occur, violators target woody trees such as *Acacia* (e.g. *Vachellia tortilis*). Most woody trees occur in the western parts of the wilderness area, where law enforcement is strongest and the natural terrain forms a natural barrier (Tuwayq Escarpment). Violators usually come from nearby villages and the collected wood is used exclusively for household purposes. No commercial wood cutting has ever been recorded in the protected area. The main reasons for wood cutting are cultural and social, as fossil fuel and electrical energy alternatives are easily available to local residents.

1.7.6. Mining

- 1.7.6.1. Najran Cement Factory: Najran Cement Company was established in 2005 as a Saudi shareholder company with a capital of 150 million SAR (approximately 40,000,000 USD). It obtained its first mining license according to the mining system approved by the late King Abdullah bin Abdul Aziz to establish a project for the cement industry in the region. The project includes the main plant located in Al Mindifan (affiliated to Sultanah Center), 240 km northeast of Najran City, as well as a separate unit for grinding cement, which is located at the Aakfah center on the road leading to the Asir area, about 70 km from Najran City. The mining project was initiated after several studies and surveys ascertained the presence of raw materials suitable for a cement industry. Based on positive results obtained from the analysis and description of raw materials by the Ministry of Mineral Wealth, the site of Al-Mindandfin was chosen as it contains most of the necessary raw materials used in the cement industry such as limestone, clay, sandstone, and gypsum.
- 1.7.6.2. Limestone Quarries: There are three inactive limestone quarry sites located on the western boundary of the protected area. The sites were once used to extract raw materials for road construction and have been inactive since early 2019. The total area used in the three sites is around 4.264 km² (426.4 ha) thus representing less than 1% of the buffer zone area. The termination of quarrying activity was enforced by the NCW (the Saudi Wildlife Authority at the time) with support from the Imarah of Najran and the Ministry of Transport (MoT). The three quarry sites were owned by two local investment companies, namely the Minwa and the Masar Construction Companies. A government decision from the Ministry of Transport - in response to NCW's request - instructed quarry activity to desist and ordered the two companies to undertake the necessary measures to rehabilitate the sites. A partial rehabilitation process has been commenced in September 2021, and the NCW and the protected area management are currently following up with the MoT and the Imarah of Najran to enforce the decisions taken to ensure a complete and satisfactory rehabilitation program.
- 1.7.6.3. Tourism and Recreation: In 2020, 'Uruq Bani Ma'arid was selected to be one of the pilot areas where ecotourism activities would be developed. As a result, the first pilot ecotourism program ever to be developed in a Saudi Arabian protected area was implemented at the protected area in early 2019. Visitors who wish to visit 'Uruq Bani Ma'arid can do so by applying online and entering their intent for the visit, number of visitors, date, and duration. Under the pilot scheme, three main ecotourism activities were developed in the protected area. these are the Wildlife Safari, the Eco-lodge, and Wilderness camping. All visitors coming to there, except those using the Eco-Camp, are accompanied by a protected area ranger who provides information, ensures their safety, and prevents any possible violations. So far, the number of visitors entering the protected area does not exceed 1,000 visitors a year.

2. Site Evaluation

2.1. Status and Trends of Site Natural Values

Includes the status and trends pertaining to physical components, natural, aesthetic, and associated cultural values of the site in terms of diversity, distribution, and status of its integrity, both enjoyed or challenged. This part also summarizes the expected future trends of these values and attributes in terms of the natural level of supply and provision versus demand coming from various uses and human-related activities. The table below summarizes the main values embraced by the site, suggests the current status, explains the main factors influencing values and attributes, and predicts the expected future trends:

Values/Attributes	Status and Future Trend	Main Factors
Key and flagship wildlife species: Arabian Oryx, Arabian Sand and Mountain Gazelles	Good in the wilderness area and severely degraded in the other zones. Future projections are not available with forecasts being dependent on the effective application of the 2021 zoning plan.	Illegal hunting, grazing competition by camels, past wildlife protection approach (keeping animals inside the core area), non-anthropogenic factors such as extended drought periods and consequent green cover recovery. Absence of an integrated research program, and weak on-site capacities to manage the wildlife herds using adequate scientific methodologies.
Flagship tree species <i>Commiphora myrrha</i> , <i>Moringa peregrine</i> , <i>Vachellia tortilis</i> , <i>Ziziphus spina-cristi</i>	Mainly present in the wilderness area, in good condition, future trend is stable with some concerns.	Illegal wood cutting, long drought periods, lack of systematic scientific monitoring, limited on-site research and monitoring capacities.
Main landforms: central sand plains, Tuwayq Escarpment, vegetated wadis, sand dunes, interdunal corridors, and eastern low-elevation sand dunes	Good with some concern, depending on the landform. Sand dunes and vegetated wadis have a better status than the western sand plains and the eastern low-level sand dunes. Overall trend stable with foreseen improvement as a result of the application of the new zoning plan and the new legal frameworks.	Dirt roads originating from the main road, mining activities (current and past), solid waste from nearby villages and towns. Tourism could pose a challenge in the long term.
Sites of cultural significance; both historical and living culture	Main archeological site of Al Faw located outside the protected area. The archeological artifacts and sites inside the protected area are in good condition and under strong protection with a positive prospect on future trends as the site is becoming more recognized	Archeological remains: natural deterioration factors due to temperatures, wind, and rain. Past vandalism and looting activities. Living culture: major change in local culture, mainly through emigration

nationally and possibly internationally for its cultural values. to towns and cities to seek employment and stability.

2.2. Factors Influencing the Protected Area

This section addresses the main issues and problems facing the protected area, especially those associated with human activities. It also lists the consequences of these issues, as well as the direct and root causes associated with them. The following table includes an analysis of eleven issues and problems facing the protected area:

1	Main Issue/Problem	Illegal wildlife hunting in the wilderness zone
	Implications	Direct and Root Causes
	<ul style="list-style-type: none"> - Deterioration of populations of wildlife species - Negative impact on the overall image and reputation of the PA and the NCW - Fosters a negative image of local community attitudes towards the PA 	<ul style="list-style-type: none"> - Weak judicial support to PA staff on law enforcement. - Inadequate logistical capabilities on site. - Weak inter-institutional collaboration (e.g. local government and community leaders).
2	Main Issue/Problem	Illegal camel grazing in the wilderness area
	Implications	Direct and Root Causes
	<ul style="list-style-type: none"> - Deterioration of vegetation cover critical to flagship wildlife species - Consequent deterioration of wildlife populations. - Illegal wildlife hunting as a by-activity 	<ul style="list-style-type: none"> - The attractiveness/productivity of the wilderness area as grazing grounds. - Lack of alternative grazing areas outside the PA to the east. - Lack of an effective grazing management program in the SRUZ and the OPZ.
3	Main Issue/Problem	Unauthorized access into the PA
	Implications	Direct and Root Causes
	<ul style="list-style-type: none"> - Increased risk of illegal hunting and other prohibited uses 	<ul style="list-style-type: none"> - The geographic expansiveness and open terrains of the PA make effective control a challenging task, especially considering the current level of human and logistic resources.
4	Main Issue/Problem	Wildlife exiting the PA in search of forage and shelter
	Implications	Direct and Root Causes
	<ul style="list-style-type: none"> - Wildlife poaching as animals leave the WZ - Waste of resources invested in the reintroduction programs and associated protection systems 	<ul style="list-style-type: none"> - Natural causes related to animal behavior as a free ranging population with no fencing and no fodder subsidy. - The seasonal availability of forage outside the WZ and the PA depending on seasonal rain and temperatures. - Dealing with the natural animal behavior as a problem while it is part of the natural setting for ungulate species.
5	Main Issue/Problem	The inadequacy of the 1996 zoning plan
	Implications	Direct and Root Causes

	<ul style="list-style-type: none"> - High level of risk to ecosystems, fauna and flora in the PA 	<ul style="list-style-type: none"> - The lack of scientific rationale on which the zoning plan was based. - The inadequate configuration of the different zones using clear criteria. The plan does not follow a clear delineation approach based on multi-criteria methodology. - The zonation was mainly based on central decisions associated with institutional management capacities, stakeholder mandates, and socioeconomic considerations, especially with regard to local grazing activities. - The zoning plan became the status quo merely focusing on the protection of wildlife populations, without proper consideration to ecosystem-based planning and species behavioral characteristics. - The 1996 zoning plan was proven ineffective in protecting site values and attributes and dealing with resource use challenges and dynamics, thus unable to fulfill effective PA management and World Heritage requirements.
6	Main Issue/Problem	Wildlife disturbance by visitors
	Implications	Direct and Root Causes
	<ul style="list-style-type: none"> - Possible deterioration of wildlife populations, thus pushing them outside the PA and lowering the quality of visitor experience 	<ul style="list-style-type: none"> - Inadequate visitor infrastructure, facilitates, and interpretive materials. - Limited visitor awareness in regard to dealing with wildlife in PAs.
7	Main Issue/Problem	Disposal of solid wastes by visitors and rangers stations
	Implications	Direct and Root Causes
	<ul style="list-style-type: none"> - Visual pollution of associated localities - Negative impacts on visitors' experience 	<ul style="list-style-type: none"> - Limited visitor awareness regarding solid waste in PAs. - Inadequate solid waste management systems, especially in remote areas. - Inadequate implementation of the solid waste collection by private sector companies using the site.
8	Main Issue/Problem	Inadequate adherence to designated visitors routes
	Implications	Direct and Root Causes
	<ul style="list-style-type: none"> - Destruction of vegetation cover thus affecting wildlife habitats and aesthetic attributes - Negative impacts on visitor experience - Fostering negative behaviors inside PAs 	<ul style="list-style-type: none"> - Lack of knowledge and awareness by visitors and some PA staff in regard to impacts of dirt roads on the PA. - Inadequate visitor and patrolling planning and standards.
9	Main Issue/Problem	Inadequate control over the SRUZ and the OPZ
	Implications	Direct and Root Causes
	<ul style="list-style-type: none"> - Increased pressure on the WZ in terms of grazing and hunting violations 	<ul style="list-style-type: none"> - Inadequate configuration of the various zones of the PA. - The weak linkage between the zonation system and capacity to manage and control it.

	- Consequent impacts on wildlife populations and behavior	- Limited backstopping from government agencies (e.g. local government and local leaders).
10	Main Issue/Problem	Inadequacies related to the current patrolling scheme
	Implications	Direct and Root Causes
	- Inefficiencies related to the site management operations, leading to challenges in PA management effectiveness	<ul style="list-style-type: none"> - The current patrolling plan is quite effective at protecting wildlife populations, mainly within the WZ, with more difficulties and challenges facing law enforcement in the SRUZ and the OPZ. - Scheme is mainly based on motorized patrolling with little relative utilization of other methods such as cameras or drones. - Current scheme suffers from being too regular and routine, thus causing enforcement loopholes and gaps. - Patrolling is not strongly linked to scientific monitoring and there are inadequate levels of documentation. - Patrolling often attempts to keep wildlife in the WZ rather than ensuring their protection throughout the PA zones. - Law enforcement/monitoring staff vary in terms of experience, capabilities, and law enforcement knowledge and skills. - The current staff rotational system seems to have serious inadequacies and significant enforcement loopholes.
11	Main Issue/Problem	Lack of systematic research and monitoring systems
	Implications	Direct and Root Causes
	<ul style="list-style-type: none"> - Inability to assess the status and trends of biodiversity in the PA - Dominance of ad-hoc management approaches and less proactive planning - Inadequate image of the PA management in light of international best practices for effective PA management 	<ul style="list-style-type: none"> - Weak coordination between the PA management on site and the central research centers. - Inadequate on-site research and scientific monitoring capacities. - Lack of adequate documentation and knowledge management.
12	Main Issue/Problem	Weak participation of local communities
	Implications	Direct and Root Causes
	<ul style="list-style-type: none"> - Increased gap between the PA management and local communities - Weak image of the PA in front of decision makers - Inability of PA management to implement its programs including fulfilling its anticipated local development role 	<ul style="list-style-type: none"> - Weak participation culture among PA management officials. - Reluctance to engage communities for fear of compromising the PA protection. - Inadequate technical and logistic capacities of PA management team.

13	Main Issue/Problem	Weak collaboration with other government agencies
	Implications	Direct and Root Causes
	<ul style="list-style-type: none"> - PA management isolation within the local development framework - Loss of important opportunities for integrated plans and solutions - Fostering anti-PA notions and intentions from local stakeholders 	<ul style="list-style-type: none"> - Lack of adequate institutional partnerships both locally and nationally. - Lack of proper delegation of authority to the site management team in dealing with partnerships. - Increased overlap between organizational mandates in and around the PA, both geographically and programmatically. - Inadequate political and strategic support from NCW.
14	Main Issue/Problem	Extractive activities bordering the protected area
	Implications	Direct and Root Causes
	<ul style="list-style-type: none"> - Direct damage to the aesthetic values of the PA - Wildlife disturbance in limited areas of the PA - Creating a precedent for future unwanted activities (limestone and cement factory quarries) 	<ul style="list-style-type: none"> - Lack of adherence to PA regulations by large industries (before the new legislative framework). - Ambiguities related to the exact boundaries of the PA. - Lack of awareness of private sector operators towards the PAs and wildlife conservation. - Lack of adequate environmental auditing systems by responsible government entities.
15	Main Issue/Problem	Farming activities bordering the protected area
	Implications	Direct and Root Causes
	<ul style="list-style-type: none"> - Negative impacts on wildlife species attracted to farms for supplementary feeding - Increased risk of wildlife poaching around farms - Wildlife damage to crops leading to human-wildlife conflict - Creating a precedent for unwanted intensive land use patterns 	<ul style="list-style-type: none"> - Use of <i>status quo</i> principle by local land right claimers. - Lack of timely decisions and support by the judicial system. - Improper use of social status and pressure to gain individual benefits. - Lack of effective monitoring by responsible government entities (former Ministry of Agriculture).

2.3. Stakeholders Analysis

The stakeholder analysis approach for 'Uruq Bani Ma'arid Protected Area was based on the influence-interest analysis methodologies. Each stakeholder was assessed in terms of their level of influence in the PA management decisions and their level of interest in conserving and sustaining its natural heritage values and attributes. The assessment resulted in four types of stakeholders: the core stakeholders who have high influence - high interest level, the potential stakeholders which have low influence - high interest level, the critical stakeholders who have high influence - low interest level, and the marginal stakeholders who possess low influence - low interest level. Accordingly, four respective stakeholder engagement strategies were identified, namely, full integration (for core stakeholders), empowerment

(for potential stakeholders), outreach (for critical stakeholders), and keeping informed (for marginal stakeholders). The matrix below summarizes the stakeholder analysis results:

Stakeholder name	Stakeholder's role	Level of influence	Level of interest	Classification	Engagement strategy
Imarah and governorates management	Political, security, and social with in-principle support to the PA as a government entity	High	High	Core	Full integration and partnership, with a special program for continuous communication and coordination
Judicial system	Legal and social with limited support to the PA	High	Low	Critical	Specialized outreach for PA benefit with awareness raising and strategic/ political lobbying.
Police department	Security and law enforcement	High	Medium	Critical / potential	Partnerships and outreach with capacity building programs.
Religious leaders and preachers	Religious and social with limited support to the PA	High	Low	Critical	Systematic outreach with programmatic partnerships.
Ministry of Tourism (MoT)	Economic with high interest in the PA business- related development, often with overlapping mandates and roles	High	High	Core / critical	Full partnerships and strategic coordination and programmatic collaboration.
Ministry of Culture	Cultural and heritage focus with high support to the PA	High	High	Core	Full partnerships, strategic coordination and programmatic collaboration.
Eco-camp operating companies	Commercial focus with high awareness of the importance of PA conservation	Medium	High	Potential / core	Clear partnerships with strong regulatory and monitoring frameworks.
Visitors – elite groups	Special interests with high support for the PA	Medium	High	Potential	Continuous communication, post service assessments, and strong enforcement of regulations.
Visitors – regular	General interests in recreation with limited awareness of the PA importance	Low	Medium	Potential / critical	Awareness raising, education, improved experiences, and strong enforcement of regulations.
Wildlife hunters	Personal and social focus with high level of hostility towards the PA	High	Low	Critical	Effective law enforcement along with awareness raising, strong lobbying with local government entities, and possible consideration of hunting alternatives (e.g.

					game reserves outside the PA).
Livestock owners (mainly camels)	Economic and social focus with high level of hostility towards the PA	High	Low	Critical	Effective law enforcement with strong outreach and alternative programs for sustainable grazing in and around the PA.
Schools	Social focus with good support for the PA concept	Low	High	Potential	Expanding on environmental awareness and education programs and facilitate <i>gratis</i> access and recreation in the PA.
Universities	Academic focus with possible interest in the PA as a platform for higher education and research	Low	Medium	Potential	Development and applied research and management-oriented studies through partnerships and joint initiatives.
Municipalities	Local development focus in and around rural areas with limited support to the PA	Medium	Low	Critical / potential	Collaboration in land use planning systems, especially near the PA, with strategic partnerships and political lobbying.
Najran Cement Factory	Economic focus with negative attitude towards the PA	High	Low	Critical	Strategic outreach with focus on environmental compliance and off-sets leading to private sector compensation for environmental damage and ecosystem rehabilitation.

2.4. Management Effectiveness Evaluation (Rapid Assessment)

A rapid protected area management effectiveness assessment was undertaken for the 'Uruq Bani Ma'arid Protected Area in 2018. The approach adopted for the assessment followed the standard IUCN six-level evaluation framework, namely: general context, planning process, management inputs, management operations, management outputs, and management results and impacts. The table below summarizes the results of the assessment conducted for 'Uruq Bani Ma'arid:

Assessment Scope	Key issues
General context	<ul style="list-style-type: none"> - The PA was designated by a high level cabinet decision, however, there is a significant level of overlap in organizational mandates, jurisdictions, and agendas between the NCW, other government entities, local communities, and the private sector. - The boundaries of the PA are clear as related to the WZ but less clear in regard to the SRUZ and OPZ, especially in relationship with camel grazing and access by local people.

	<ul style="list-style-type: none"> - The historic involvement of the former Ministry of Agriculture in the configuration of the zoning plan was counterproductive and set a negative precedent for the NCW control capacity, thus creating serious challenges for controlling human activities in the SRUZ and the OPZ. - There is some overlap and challenges related to the mandate over tourism development and cultural heritage conservation in the PA. - There is a serious conflict with the mining activities (i.e. Najran Cement Factory) which was established without proper involvement of NCW (NCWCD then in 2005). - The staff lacks the needed law enforcement powers (power of arrest) in dealing with hunting and grazing violations, coupled with weak support from the judicial system and law enforcement entities. - There is a serious lack of information management systems to support the PA management decisions.
Planning	<ul style="list-style-type: none"> - There is no agreed upon management vision or objectives for the PA among stakeholders. - The main management framework is defined in the national system plan of the NCW and was developed around ten years ago. - The overall design of the PA is adequate and fulfills its establishment objectives, however, the design and configuration of the 1996 zoning plan does not fulfill the requirements for effective management, thus requiring systematic restructuring and reconfiguration. - Until 2019, there was no proper management plan for the protected area, however, since 2010, the PA has seen strong operational planning by the newly appointed PA Manager and the central planning team at NCW. - Stakeholder involvement and participation in PA planning and management is limited and requires a total transformation effort in culture and program.
Management inputs	<ul style="list-style-type: none"> - The PA management team is well experienced and skilled, with an ambitious vision and strong work ethic, with intent to seek national and international recognition. - There is no systematic scientific monitoring program for the PA. Most research activities are ad-hoc and conducted by the central research centers of the NCW, with limited involvement of the PA management team in planning and implementation. - The current staffing level of the PA is not adequate and requires significant restructuring and improvement, including the creation of new functional units such as community outreach, environmental education, ecotourism development and visitors' management, scientific research and monitoring, and knowledge and information management. - Human resource management is highly centralized and often obstructive to the site team's ability to operate efficiently. - Capacity building and staff training activities are not systematic and require significant restructuring to become needs-based and management-oriented. - The current budget is inadequate to fulfill the requirements of a fully functional PA, based on international best practices. However, the current budget is sufficient for the current law enforcement-focused program of the PA.
Management operations	<ul style="list-style-type: none"> - There is no clear mechanism for site operations planning in addition to a lack of proper documentation systems, excepting the periodic reports prepared

	<p>annually by the PA Manager and the numerous daily bureaucratic correspondence related to human resources and financial management.</p> <ul style="list-style-type: none"> - The only functional operational programs are the law enforcement and administrative/logistic support programs. - Present equipment and facilities are adequate for the currently functioning programs, but are seriously inadequate for effective PA management (i.e. research, education, outreach, tourism). - Facilities and equipment maintenance systems are highly centralized, thus causing bureaucratic challenges. - There are no operational mechanisms for communication with local people and other stakeholders, and there is an unclear policy position on the issue from NCW centrally.
Management outputs	<ul style="list-style-type: none"> - There are limited communication channels with local stakeholders, thus causing lack of stakeholder support for the PA. - Visitor access to the PA is hindered by lack of facilitated access mechanisms, visitor facilities, activities, and adequate marketing and promotion. Visitor permits are managed centrally by the NCW. - Tourism has a great potential in the PA but as yet does not provide any significant support to the PA management, either financially or non-financially. - There are no entrance fees for PA access, a neglected opportunity for financial support.
Management Results and Impacts	<ul style="list-style-type: none"> - The overall management effectiveness level of the PA is generally adequate in the WZ, but much less effective in the SRUZ and OPZ, thus requiring major restructuring and enhancement using internationally accepted criteria and standards (e.g., IUCN guidelines). Restructuring should be based on the principles of good governance including improved delegation of authority, enhanced accountability, diversified programming, stakeholder participation, and effective science-based monitoring. - The overall state of values and attributes is highly satisfactory in the WZ, albeit to a lower extent in the SRUZ and OPZ. This is due to the inadequacy of the 1996 zoning plan and the inadequacy of the key PA roles and functions. - Judgement of the status of natural heritage values is often challenged by the lack of systematic research and monitoring and suboptimal staff capacities and capabilities. - Control over human activities is seriously challenged outside the WZ. - The PA is far from fulfilling its potential for sustainable development of local communities and effective management of natural resource use.

3. Management Program (2021-2023)

This section of the abbreviated management plan includes the management program for the period from 2021 – 2023; describing the proposed strategic management framework, anticipated three-year results, and management actions and measures.

3.1. Management Objective

To conserve the outstanding natural values of 'Uruq Bani Ma'arid Protected Area, which represents the world's largest sand sea and encompasses characteristic ecosystems and habitats, while embracing a number of global flagship species, including the world's only free ranging population of the regionally endemic Arabian Oryx and Arabian Sand Gazelle, in addition to numerous flora and fauna species, which are important for global biodiversity conservation.

3.2. Long-term Vision

The 'Uruq Bani Ma'arid Protected Area serves as a national model for effective protected area management, where biodiversity of global importance is recognized and sustainable local development is achieved for the benefit of future generations.

3.3. Anticipated Results (2021 – 2023)

1. The successful enlisting of 'Uruq Bani Ma'arid protected area on the UNESCO World Heritage List by 2023.
2. An updated and integrated conservation zoning plan for 'Uruq Bani Ma'arid PA, which balances natural heritage conservation requirements with sustainable use of resources and sustainable development.
3. Adequate capacities of the site management team to match the international standards for effective management.
4. A comprehensive information management system established and maintained for the long-term management and monitoring of the PA.
5. A tourism development program drafted and initiated, using international standards for ecotourism and responsible visitation.
6. An effective program for sustainable rangeland management developed and initiated to serve biodiversity conservation and sustainable use of local resources.
7. A pilot initiative for sustainable wildlife hunting developed outside the PA based on internationally accepted standards, aimed to alleviate illegal hunting pressure and to support the PA management.
8. A comprehensive scientific research and monitoring program developed and implemented in cooperation with national and international academia and research entities.
9. An interactive environmental education and awareness-raising program developed and implemented for local schools, CBOs, and women sectors in and around the PA.
10. An effective environmental auditing system proactively – or retrospectively – addressing all medium and large-scale projects around the PA, with particular focus on extractive industries, intensive agriculture, and tourism activities.

3.4. Work-plan (2021 – 2023)

A detailed three-year action plan for the implementation of the above management goals was prepared with a clear set of Key Performance Indicators (KPIs) and an estimated budget. The work plan includes a number of activities related to each of the outputs described above with a budget allocated for each of the activities. The table below summarizes the three-year work plan:

No	Output	Number of activities
1	Proposal for the enlisting of 'Uruq Bani Ma'arid PA on the UNESCO World Heritage List submitted to UNESCO by January 2022.	7
2	An updated and integrated conservation zoning plan for 'Uruq Bani Ma'arid, which balances natural heritage conservation requirements with sustainable use of resources and sustainable development.	6
3	Adequate capacities of the site management team to match the international standards for effective management.	7
4	A comprehensive information management system established and maintained for the long-term management and monitoring of the PA.	6
5	A tourism development program drafted and initiated, using international standards for ecotourism and responsible visitation.	7
6	An effective program for sustainable rangeland management developed and initiated to serve biodiversity conservation and sustainable use of local resources.	6
7	A pilot initiative for sustainable wildlife hunting developed outside the PA based on internationally accepted standards, aimed to alleviate illegal hunting pressure and to support the PA management.	6
8	A comprehensive scientific research and monitoring program developed and implemented in cooperation with national and international academia and research entities.	5
9	An interactive environmental education and awareness raising program developed and implemented for local schools, CBOs, and women sectors in and around the PA.	7
10	An effective environmental auditing system proactively – or retrospectively – addressing all medium and large-scale projects around the PA, with particular focus on extractive industries, intensive agriculture, and tourism activities.	5

The below matrix details the three-year action plan:

Results (1): Proposal for the enlisting of 'Uruq Bani Ma'arid PA on the UNESCO World Heritage List submitted to UNESCO by January 2022.

No	Action	Timetable (2021-2023) by quarters										
		2021			2022			2023				
1.1	Form the team of expert for the preparation of the nomination file.											
1.2	Prepare the first draft of the WH nomination file.											

1.3	Submit the draft file to UNESCO												
1.4	Train NCW team on Natural WH Nominations												
1.5	Organize a national event in case of a successful WH nomination.												
1.6	Produce and disseminate a set of knowledge and promotional materials on UBM.												
1.7	Participate on the WH Committee meetings												

Results (2): An updated and integrated conservation zoning plan for 'Uruq Bani Ma'arid, which balances natural heritage conservation requirements with sustainable use of resources and sustainable development.

No	Action	Timetable (2021-2023) by quarters											
		2021			2022			2023					
2.1	Update the ecological and socioeconomic baseline data												
2.2	Analyze land use patterns and associated stakeholders												
2.3	Assess impacts of land use on the site's values and attributes												
2.4	Revise the conservation zoning plan with the buffer zone and discuss with stakeholders												
2.5	Adopt the revised zoning plan and the buffer zone officially												
2.6	Establish a stakeholders communication committee on the zoning plan implementation with focus on the buffer zone management												

Results (3): Adequate capacities of the site management team to match the international standards for effective management.

No	Action	Timetable (2021-2023) by quarters											
		2021			2022			2023					
3.1	Prepare and adopt a new management structure for the protected area												
3.2	Create the technical units needed for the application of the new structure												
3.3	Prepare and conduct a staff induction program using IUCN Guidelines												

3.4	Conduct a training needs assessment and conduct priority training to all units staff (e.g. community participation, ecotourism, ungulates management, integrated land-use planning, visitors management, environmental education)											
3.5	Develop and conduct advanced training on middle management and team leadership											
3.6	Conduct training on financial planning and management											
3.7	Conduct specialized training on project planning, fund raising and monitoring											

Results (4): A comprehensive information management system established and maintained for the long-term management and monitoring of the PA.

No	Action	Timetable (2021-2023) by quarters											
		2021			2022			2023					
4.1	Create a site-based information archiving system												
4.2	Undertake electronic gap-filling program for available data												
4.3	Identify information gap (e.g. socioeconomic data, land use patterns)												
4.4	Develop and disseminate a set of knowledge products about the PA												
4.5	Establish a specialized website for the PA												
4.6	Prepare the PA annual report												

Results (5): A tourism development program drafted and initiated, using international standards for ecotourism and responsible visitation.

No	Action	Timetable (2021-2023) by quarters											
		2021			2022			2023					
5.1	Develop the interim ecotourism development plan for the PA												
5.2	Assess the interim phase of tourism development												

5.3	Devise the comprehensive ecotourism and wilderness leadership program for the PA												
5.4	Produce a series of promotional materials on the site's ecotourism and wilderness opportunities												
5.5	Devise and implement a series of specialized training programs for local staff and communities with focus on wilderness leadership and leave no trace approaches												
5.6	Development and implement a series of community training programs on small tourism business planning, visitors services, and environmental standards.												
5.7	Develop and maintain a cooperation program with the National Commission for Culture (MOC) on linkages between the PA and cultural heritage (e.g. Al Faw site).												

Results (6): An effective program for sustainable rangeland management developed and initiated to serve biodiversity conservation and sustainable use of local resources.

No	Action	Timetable (2021-2023) by quarters											
		2021			2022			2023					
6.1	Conduct a technical workshop on the feasibility of a community based hunting reserve in proximity of the PA												
6.2	Identify a number of options/scenarios for the establishment of the community based hunting reserve												
6.3	Implement a pilot phase of sustainable hunting initiative												
6.4	Evaluate the pilot phase of sustainable hunting initiative and devise a response strategy												
6.5	Prepare and disseminate a set of knowledge products on the wildlife hunting problem												

8.4	Prepare a biannual report on the status of PA biodiversity and natural heritage												
8.5	Develop and adopt the 5-year integrated management plan for the PA based on the results of the WH nomination process												

Results (9): An interactive environmental education and awareness raising program developed and implemented for local schools, CBOs, and women sectors in and around the PA.

No	Action	Timetable (2021-2023) by quarters											
		2021			2022			2023					
9.1	Recruit and train a site based environmental education and awareness raising officer												
9.2	Develop and sign a cooperation agreement with the local education department on environmental education for school (both genders)												
9.3	Develop and sign a cooperation agreement with the university of Najran on environmental education for students (both genders)												
9.4	Establish an education/visitors center/unit in the main management station												
9.5	Organize an annual PA festival under local government auspices												
9.6	Organize an annual environmental competition themed around the PA												
9.7	Produce a set of educational materials and tools customized for the PA												

Results (10): An effective environmental auditing system proactively – or retrospectively – addressing all medium and large-scale projects around the PA, with particular focus on extractive industries, intensive agriculture, and other urban development activities.

No	Action	Timetable (2021-2023) by quarters											
		2021			2022			2023					
10.1	Initiative dialogue with the Najran cement factory on their												

	environmental compliance program												
10.2	Prepare and sign a cooperation agreement with the cement factory o their environmental management plan and off-sets program												
10.3	Devise and initiative a specialized monitoring system for the cement factory and other urban development activities												
10.4	Complete the rehabilitation of the limestone quarries in the buffer zone												
10.5	Devise and enforce an environmental monitoring system for the private farms in the buffer zone												

3.5. The Conservation Zoning Plan

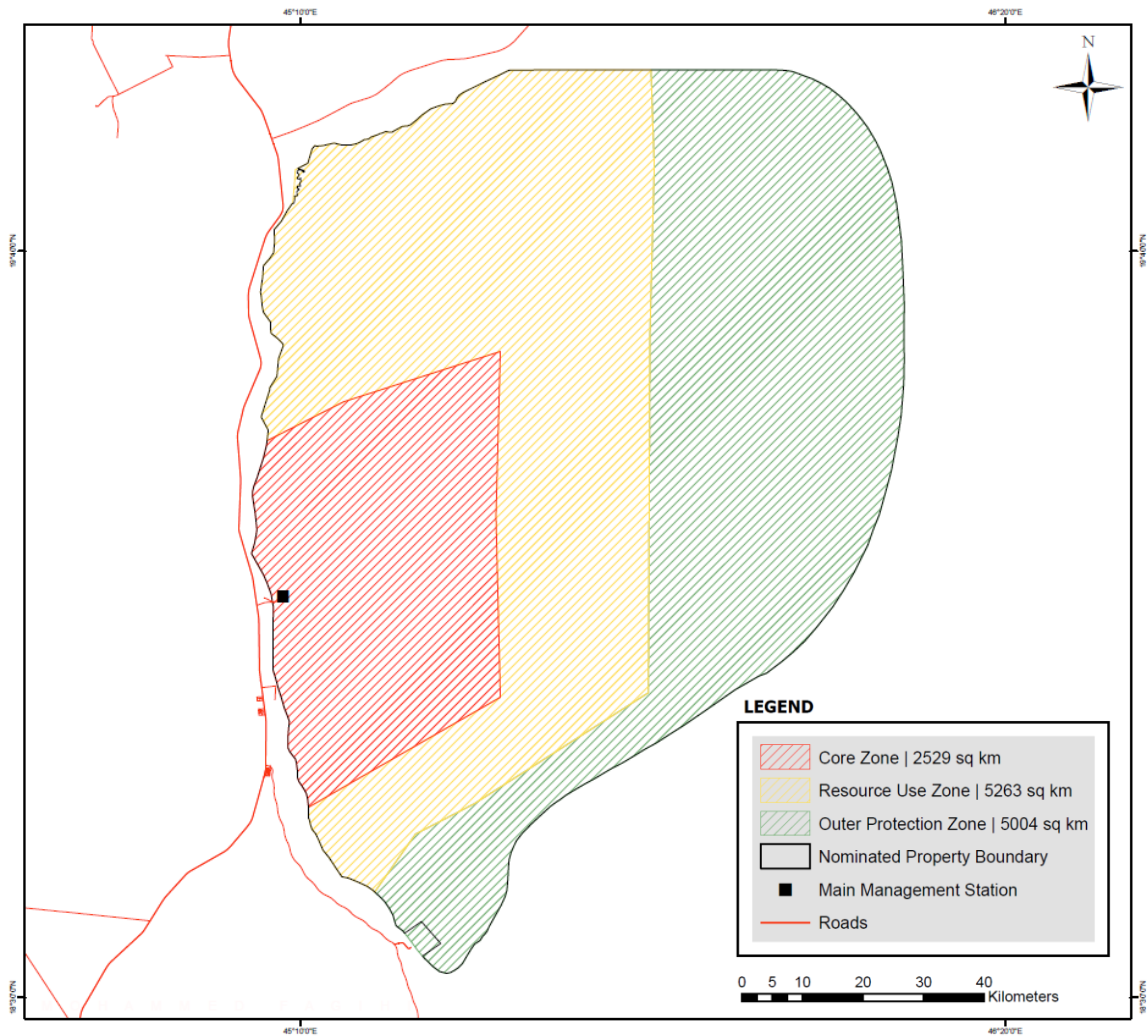
3.5.1. One of the main management tools applied for the implementation of the 2021-2023 management plan is the revised zoning plan, which represents a total redesign of the 1996 zoning plan and is based on the new vision for the protected area as a potential natural World Heritage Site.

When the SWA began planning the zonation of the 'Uruq Bani Ma'arid Protected Area, it envisaged two zones: a Special Nature Reserve in the western part of the protected area covering some 40% of the total area and a Resource Use Reserve making up the remaining 60%. At that time, there were widespread views among the Kingdom's government circles and the public that the NCWCD had taken unreasonably large areas for wildlife and biodiversity conservation. When the protected area's proclamation of 'Uruq Bani Ma'arid became imminent, the Board of Governors stipulated that the Special Nature Reserve must not exceed a 40 km by 60 km rectangle and that beyond the managed grazing area, the local livestock owners must have a substantial area in which they could manage their livestock without any interference by the conservation agency. It further stipulated that the livestock users could traverse the Special Nature Reserve zone with their herds.

The zonation scheme that resulted from these constraints was far from ideal. It included a "core" wildlife conservation Special Nature Reserve zone of 2,529 square kilometers, extending from Shiqqat ath-Thilmah al-Bayda' / Shiqqat al-Munkhatimah in the south to 'Irq Ghudayy ash-Shamali and extending north-eastward from one kilometre west of the base of the Tuwayq Escarpment to Longitude 45° 30'E, surrounded on three sides by around 5,263 km² of a Resource Use Zone extending eastward to Longitude 45° 45'E, in which the NCWCD and the

local pastoralists would devise a managed grazing scheme to accommodate the grazing of wild ungulates together with domestic livestock, and east of Longitude 45° 45'E, NS a "Controlled Hunting" zone of 5,004 km², in which the NCWCD had no jurisdiction other than to prevent hunting. Routes were agreed along which the livestock users could traverse the Special Nature Reserve Zone with their herds, provided that they not linger to take advantage of the vegetation. See the map below.

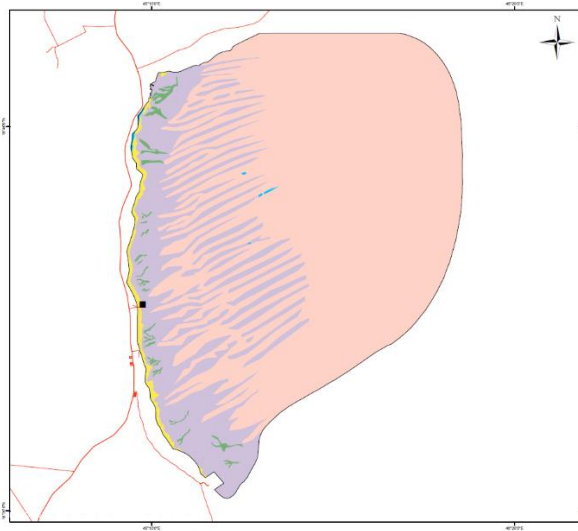
Map of 1996 Zoning Scheme



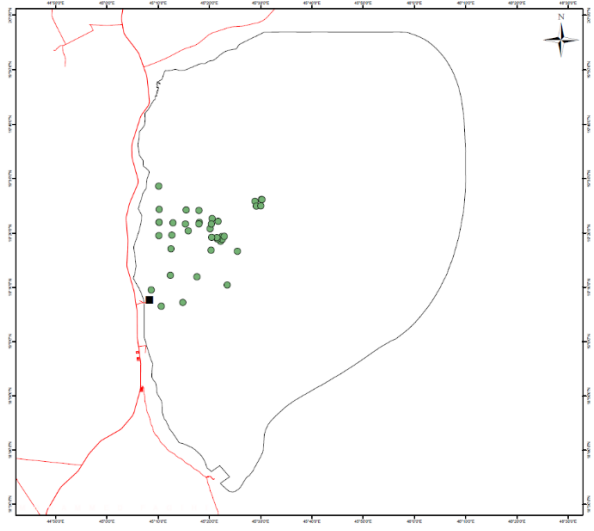
The scheme shown here above has worked very well for the livestock owners and has led to a good relationship between them and the protected area management and rangers. Over the two-and-a-half decades of protected area management since the protected area's designation, however, it has become clear that the zone devoted exclusively to the conservation of biodiversity was far too small to support flourishing herds of Arabian Oryx, Arabian Sand and Mountain Gazelles. Under the hyperarid conditions of the site, forage is a fugitive resource, and wild ungulates, which unlike livestock, have no supplemental fodder to fall back on, need to range widely, following the erratic rains to find enough forage to survive. For conservation of wild ungulates to be sustainable over time, the zone devoted exclusively to the conservation of biodiversity needed to expand to accommodate larger ungulate populations. In light of the above, a new updated zoning plan for the 'Uruq Bani Ma'arid Protected Area was needed to ensure the highest of level of integrity and effective long-term protection of the site's natural values and attributes of global significance. The approach adopted to devise the zoning plan followed a systematic process using a logical framework, described below:

3.5.2. Create the natural heritage layer to include all key natural values and associated cultural values along with the attributes representing them using a series of “natural heritage layers”, as follows:

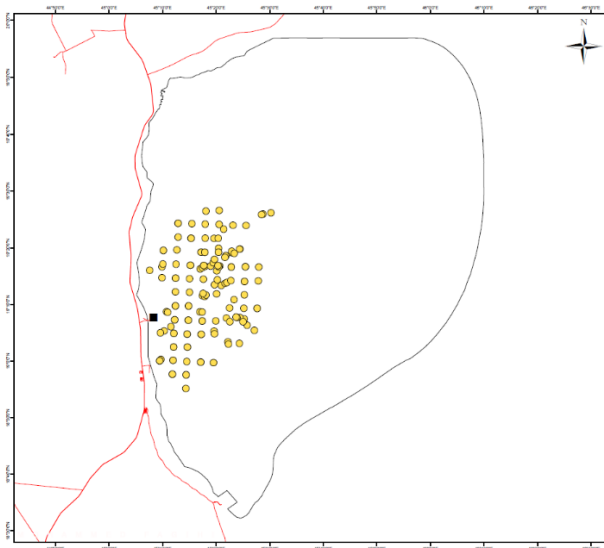
1. Adequate representation of the main bioregions occurring in the nominated property thus encompassing the main ecosystems and natural habitats needed for the survival and sustainability of key biodiversity and wildlife species and at the same time exemplifying the aesthetic values of the area.
2. Key mammal species starting with the Arabian Oryx, Sand and Mountain Gazelles in addition to the five threatened mammal species recorded in the nominated property.
3. Key bird species of global importance recorded in the nominated property including Lappet-faced Vulture, Egyptian Vulture, Arabian Houbara, and Pallid Harrier.
4. Key reptile species of global importance recorded in the nominated property including the Egyptian Spiny-tailed Lizard *Uromastix aegyptius*, and five species endemic to the Arabian Peninsula and/or the Kingdom of Saudi Arabia: *Scincus mitranus*, *Trigonodactylus arabicus*, *Stenodactylus slevini*, *Acanthodactylus ophiodurus*, and *Acanthodactylus schmidtii*.



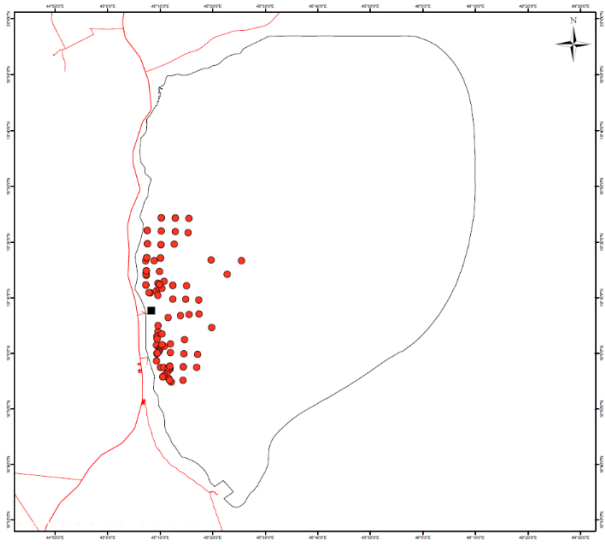
Bioregions



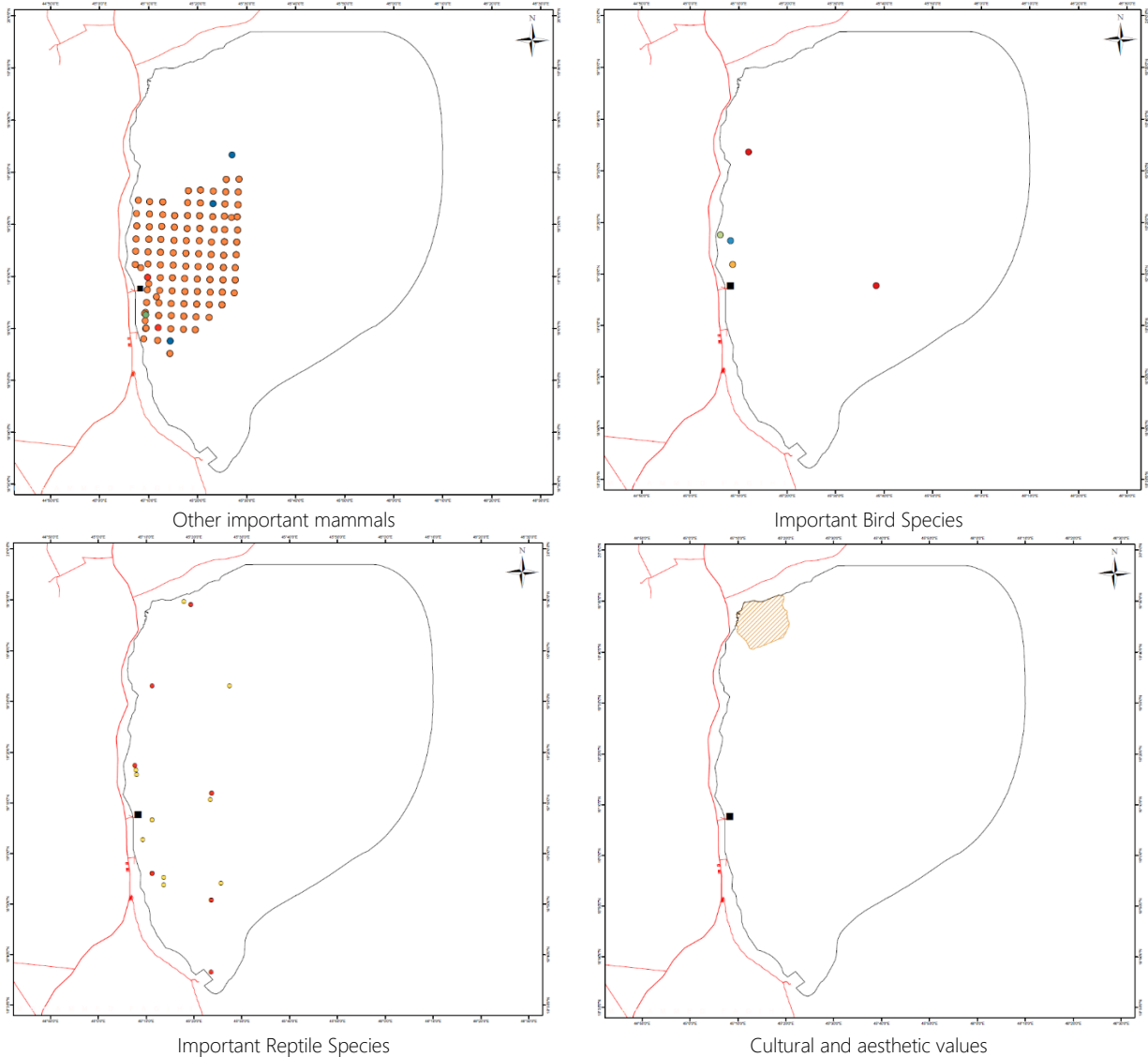
Arabian Oryx



Arabian Sand Gazelle



Arabian Mountain Gazelle

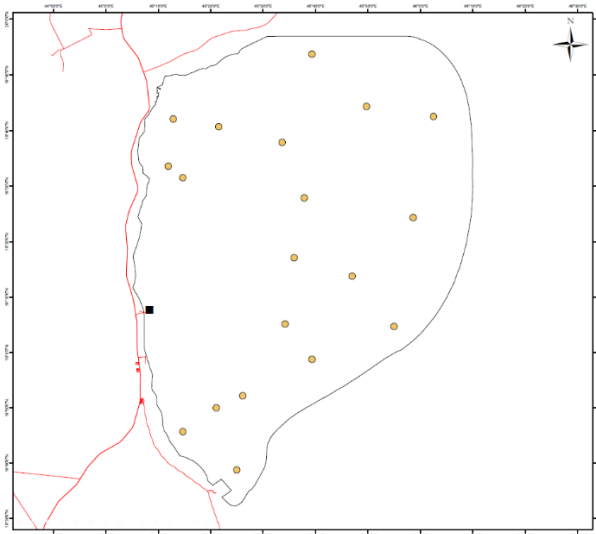


The collation of all the layers above form the basis for the "ideal" zoning option for the nominated property. However, the above layers need to be weighed with the other main layer associated with the nominated property, the resource use layer.

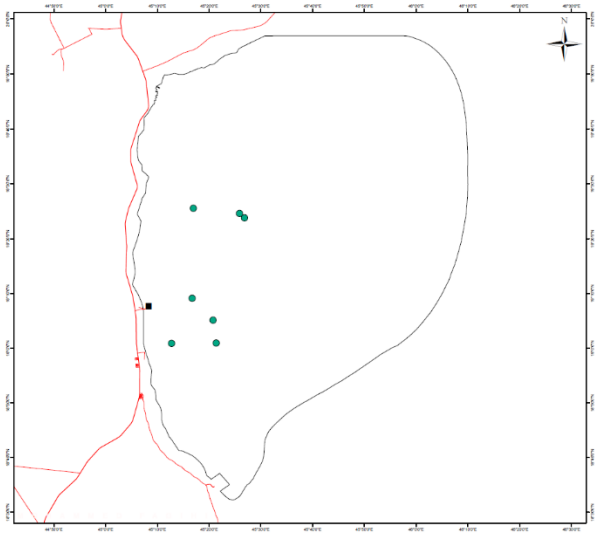
3.5.3. The creation of the resources use layers represent the distribution and intensity of the various human uses occurring in and around the nominated property (including the buffer zone). Collectively they form a spatial presentation of the factors influencing the values, attributes and their integrity:

1. Areas affected by illegal camel grazing in and around the wilderness zone.
2. Areas affected by illegal wildlife hunting in and around of the wilderness zone.
3. Areas affected by illegal wood cutting mainly in the Tuwayq Escarpment.
4. Areas affected by extractive industries specifically in the buffer zone.
5. Areas affected by private farming specifically in the buffer zone.

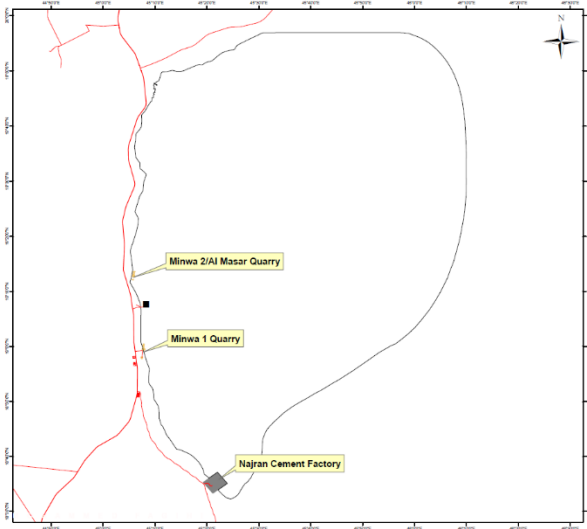
6. Areas used for ecotourism and recreational activities currently at very low numbers, however, with a forecast of rapid increase in coming years.



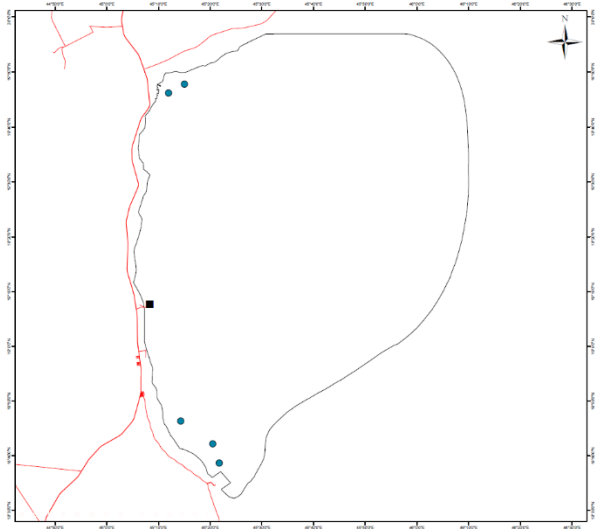
Camel grazing incidents



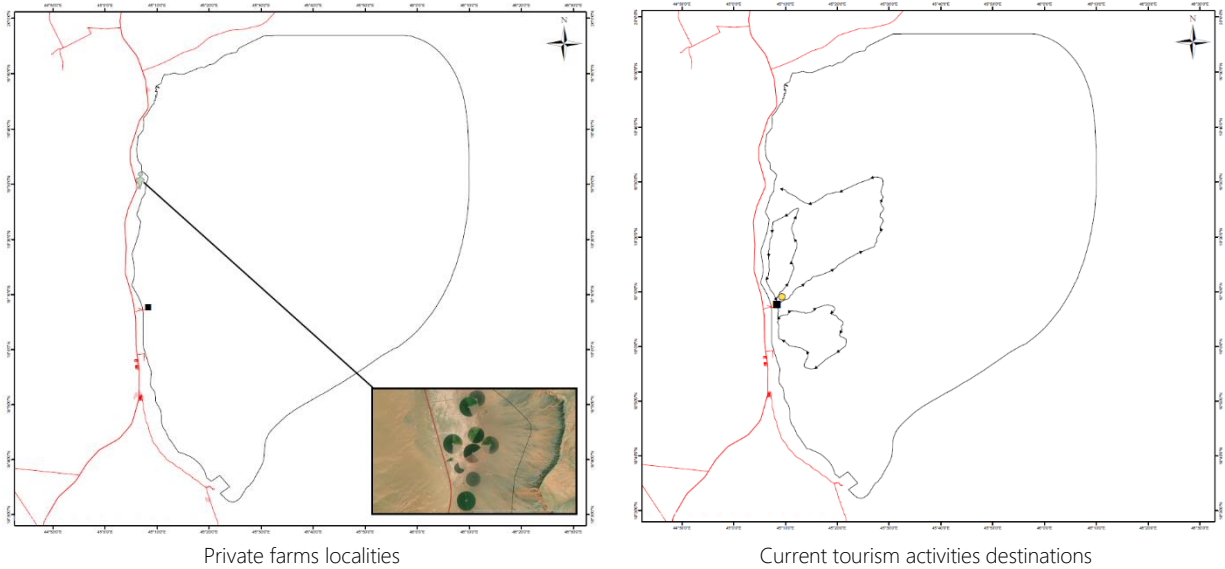
Wildlife hunting incidents



Extractive activities localities



Wood cutting incidents



3.5.4. The 2021 Zoning Plan: Resulting from the above analysis process, the updated 2021 conservation zoning plan of the 'Uruq Bani Ma'arid nominated property comprises four zones, with an additional buffer zone outside the PA, as follows:

- 3.5.4.1. A Wilderness Zone (IUCN Category Ib) of 6,847.5 km² (54% of the nominated property) encompasses the areas of highest biodiversity, from the central sand plain at the base of the Tuwayq Escarpment through the escarpment, the limestone plateau with its key habitats, and the highly complex linear sand dunes ('uruq) that give this site its name, along with their inter-dune corridors (*shiqaaq*). This zone functions as the beating heart of the nominated property, where most elements of outstanding universal value are located. It represents an almost 300% expansion from the 1996 zoning plan "core zone".
- 3.5.4.2. A Nature-Culture Ecotourism Zone (IUCN Category II) of 268.5 km² (just above 2% of the nominated property) adjoins the archaeological site of Al Faw on the northwestern edge of the nominated property. This zone functions as the platform where ecotourism development and environmental education would take place, thus providing the anticipated learning opportunity for people coming to the site from inside the Kingdom of Saudi Arabia and abroad.
- 3.5.4.3. A Sustainable Resource Use Zone (IUCN Category VI and V?) 5,601.4 km² (44% of the nominated property) in the northeastern, eastern, and southern parts of the protected area is to be managed mainly by the local livestock owners in collaboration with the NCW. This area would function as the platform where sustainable camel grazing can be tested and maintained. It also plays an important buffering function in support of the wilderness zone.
- 3.5.4.4. A General Use Zone of 42.9 km² (less than .05% of the nominated property) surrounding the protected area's main management station and related facilities, such as the garage for vehicle repair, weather station, and main release enclosure for wildlife reintroduction, the

ecotourism camp with its support facilities, and the main access road, which is paved up to the ranger station. This zone functions as the main development and logistic support hub for the management of the nominated property and the development of ecotourism and sustainable recreation.

- 3.5.4.5. A Buffer Zone of 806 km², adjoining the nominated property on its western and northwestern sides covers the area's most susceptible to activities and facilities that could affect the nominated property for good or ill. The buffer zone's main function is to enable the management authority to maintain the property's integrity: to encourage projects that support the protected area, to avert the impacts of current and future development activities, to supervise restoration of the road-building quarries and the amelioration and eventual restoration of the cement factory site, and to ensure that the vistas of the property and the entries and gateways to it are under the supervision of the NCW.

This zoning plan represents a vision to be achieved over the coming decade. The NCW recognizes that any abrupt authoritarian decree to deprive the local communities of access to the grazing resources that they have been enjoying from before the protected area's establishment and during its first two-and-a-half decades would be unacceptable to the local communities. The national mandate to conserve and protect the outstanding universal values of this site needs to be balanced with the provision of economic, social, and cultural benefits and compensations that are accepted, as well as leading roles in the management of the site and its surrounding area.

3.5.4.6. Map of the 2021 Zoning Plan

