



Jabal Shada Protected Area Management Plan

2025-2030



EXECUTIVE SUMMARY

Jabal Shada Protected Area (JSPA) envisions becoming a restored, protected and sustainably used, and resilient example of the ecological processes, habitats, and species typical of the Southwest Arabian Montane Woodlands and Grasslands Ecoregion, which supports sustainable benefits to local communities and citizens of Saudi Arabia as a whole. To achieve the set vision, the PA must be managed effectively, in that regard, the development of this General Management Plan (GMP) is critical. The development of this GMP is linked to Article 32 of the Constitution of the Kingdom of Saudi Arabia (KSA) which states that “*the State shall endeavor to preserve, protect and improve the environment and prevent its pollution*” and Article 3 of the Wildlife Protected Areas Law that empowers the Saudi Wildlife Authority (a predecessor of the National Center of Wildlife - NCW) to Manage Protected Areas (PAs) in the Kingdom of Saudi Arabia. Therefore, this plan is set to guide the implementation of daily operations of the protected area from 2025 to 2030 in a manner that will contribute to the achievement of the PA's Vision, fulfillment of the constitutional obligations, and meet international standards and best practices.

This GMP is structured into six sections which are then subdivided into several subsections as follows; In Section One, the GMP provides a brief description of the biogeography of Saudi Arabia, its Social and Political Contexts, and the History of Protected Areas in the Kingdom. Furthermore, Section One introduces the 10 Protected Areas, Management Plan Objectives, and an overview of conducted field visits. Section Two presents a detailed description of the legal status of the protected area, policy, and legal framework. Specifically, the section covers the institutional and legal settings of the Protected Area. The latter includes detailed descriptions of the national and international obligations, laws, rules, regulations, guidelines, and plans that support the management of the PA and its resources. Section Three provides a comprehensive introduction to the PA and an assessment of the protected area including its location, accessibility, administration, and management in addition to the PA's physical, cultural, financial, socioeconomic, biological, and human resources. Conversely, the section presents threats and pressures that affect major site values in addition to SWOT analysis.

In Section Four, the GMP focuses on the vision and target outcomes. The section further describes stakeholders' consultation outcomes, major site values, and protected area vision, mission, and goals under which strategic objectives and operational KPIs are presented. Section Five presents the Strategy and Road Map in four different subsections covering threat mitigation and restoration initiatives, zoning and phasing strategy, in addition to operations and infrastructure. The last Section (Section Six) describes enablers, and implementation plans under four themes – firstly: operational design focusing on governance structure, organization, and people, secondly: risk mitigation approach, thirdly: implementation strategy, and fourthly: monitoring approach.



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ABBREVIATIONS/ ACRONYMS

<i>BOT</i>	Build Operate and Transfer
<i>GCC</i>	Gulf Cooperation Council
<i>IUCN</i>	International Union for Conservation of Nature
<i>KSA</i>	Kingdom of Saudi Arabia
<i>MEWA</i>	Ministry of Environment, Water, and Agriculture
<i>MoT</i>	The Ministry of Tourism
<i>NBSAP</i>	National Biodiversity Strategy and Action Plan
<i>NCW</i>	National Center for Wildlife
<i>NCWCD</i>	National Center for Wildlife Conservation and Development
<i>NCWM</i>	National Center for Waste Management
<i>PA</i>	Protected Area
<i>POI</i>	Points of Interest
<i>SASO</i>	Saudi Standards, Meteorology, and Quality Organization
<i>SGI</i>	Saudi Green initiative
<i>TFA</i>	Tourism Focus Areas
<i>TDF</i>	Tourism Development Framework
<i>UN</i>	United Nations
<i>UNFCCC</i>	United Nations Framework Convention on Climate Change



GLOSSARY OF TERMS

TERM	DEFINITION
<i>Alien invasive species</i>	A non-native plant or animal species that, when introduced to a new habitat, can spread if uncontrolled, causing harm to the native species, environment, economy, or human health.
<i>Biodiversity</i>	Biodiversity is biological diversity - the full variety of living things – including plants, animals, fungi, and bacteria. It is considered at all scales, from the different genes in an individual to species and the populations they form, as well as the complex arrangements of ecosystems.
<i>Biogeography</i>	The distribution patterns of ecosystems and biodiversity across space and time and their geographic ranges.
<i>Ecoregions</i>	Distinct geographic areas characterized by specific combinations of climate, vegetation, and ecological features, serving as ecological units that help in understanding and managing biodiversity patterns.
<i>Carrying capacity</i>	The number of animals or visitors, intensity, and type of use that can be accommodated in an area without deterioration of the essential biophysical, conservation, and experiential values of a particular environment.
<i>Cultural heritage</i>	Inherited assets that people identify and value as a reflection and expression of their evolving knowledge, beliefs, and traditions, and of their understanding of the beliefs and traditions of others.
<i>Endangered species</i>	Species that are at significant risk of becoming extinct in the near future if effective conservation measures are not taken.
<i>Impact</i>	An impact upon visual aspects of the heritage or natural setting, a direct impact upon the physical environment, or an impact on the biological components or properties of an ecosystem.
<i>IUCN Green List</i>	The IUCN Green List is a global programme of certification aiming to achieve and promote effective, equitable, and successful protected and conserved areas by highlighting best practices and providing a benchmark for progress toward effective and equitable management.
<i>IUCN Red List</i>	The International Union for Conservation of Nature's list of species is categorized by their risk of extinction.
<i>Integrity</i>	A measure of the wholeness and intactness of a Protected Area and the survival and condition of those elements that contribute to their significance.
<i>KPI</i>	Key Performance Indicators (KPIs) are the critical (key) quantifiable indicators of progress toward an intended result.
<i>Monitoring and Evaluation</i>	The systematic collection and analysis of data to assess the performance and effectiveness of management actions.
<i>Poaching</i>	Illegal hunting, capturing, or harvesting of wildlife, often for trade or consumption.
<i>Protected Area</i>	A protected area is a clearly defined geographical space, recognized, dedicated, and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.
<i>Restoration</i>	To return a conservation asset to a known earlier state in terms of diversity, abundance, and/or ecological functioning.
<i>Stakeholder engagement</i>	The process of involving individuals, groups, and organizations who have an interest or stake in the management of a protected area.
<i>Sustainable development</i>	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
<i>Zoning</i>	The process of delineation of a protected area into different zones, each with specific regulations and permitted activities.



SECTION ONE: INTRODUCTION

1.1. BIOGEOGRAPHY OF SAUDI ARABIA

The Kingdom of Saudi Arabia is about 2,000,000 km² occupying four-fifths of the Arabian Peninsula. It is the tenth largest country, covering 1.64% of the world's land area and 8% of the land area of Asia.

Saudi Arabia divides naturally into seven terrestrial physiographic regions (with 30 subregions) and two marine regions (Child & Grainger, 1990). More recently, a new classification defines hierarchically a total of 4 Realms, 20 Eco-regions, and 65 Ecosystems (Llewellyn, 2023). These ecosystems span a wide diversity of terrestrial habitats, from mesic, cool, high mountains through arid desert steppes to hot, semi-arid coastal plains. The range of marine habitats is diverse and includes mangroves, sea grass beds, and coral reefs of both the Western Indo-Pacific (Red Sea) and Indo-Malayan (Arabian Gulf) realms.

Despite this large area, the flora, of about 2,250 species, is comparatively modest in number of species, but it is biogeographically very interesting in containing elements of three major elements, namely the western part of the Palearctic, the Afrotropical, and the Oriental. Hence the region has a flora that includes representatives of European, Asian, and African groups (García, *et al.* 2015). Although well-known at a broad taxonomic level, details of the distribution and population status of many species are still poorly documented. Increasing human pressures lead to habitat loss, chronic overgrazing, cutting of trees for firewood, and indiscriminate off-roading on fragile desert soils, exacerbating the impact of severe droughts and low and unpredictable rainfall even under normal conditions.

The diversity of large animals and birds is also modest. Species, such as Arabian oryx, Nubian ibex, Dugong, and Arabian leopard, for example, are restricted in distribution whereas many migratory birds cross the Arabian Peninsula as part of a major migratory flyway. Many of the larger mammals were either extirpated (Arabian oryx, Saudi gazelle) or exist as fragmented, small populations (Nubian ibex, Mountain gazelle). The invertebrate fauna is poorly known, and new species are regularly documented (Al-Qahtni *et al.*, 2023). Most elements of the fauna are under threat from changes in land use practices that alter habitats (especially mountains, wetlands, and coastal areas) as well as through unsustainable hunting practices.

1.2. SOCIAL AND POLITICAL CONTEXT

The social and political context of each country shapes how biodiversity conservation and management is undertaken. The economic status of the country, the standard of infrastructural development, the size, income, and educational levels of its population, and its beliefs and customs lead to unique and applicable approaches to the management of its protected areas.

The Kingdom of Saudi Arabia is a vast country with ample human and financial capital as well as large energy and mineral resources. The younger generation makes up over two-thirds of Saudi Arabia's population of 35 million. Saudi Arabia is an absolute monarchy. Traditional family and Islamic values remain central. Saudi Arabia is culturally a tribal society. Most people are deeply religious and conservative.

Part 2 of the National Biodiversity Strategy for the Kingdom of Saudi Arabia looks at the Islamic vision and basic principles guiding the conservation of biodiversity and stresses the fact that the conservation of the natural environment is an imperative commanded by Allah. The protection of the natural environment from abuse by man leads to the welfare of man himself, together with the welfare of all other beings.

Vision 2030 outlines transformational economic and social development changes for the Kingdom. It has many strands of which the focus on sustainability, clean energy, and the development of tourism have an important bearing on the future management and development of the Protected Areas of the Kingdom.



1.3. HISTORY OF PROTECTED AREAS IN THE KINGDOM

The Kingdom of Saudi Arabia has two policy documents: the National Biodiversity Strategy and Action Plan (NBSAP) and the Protected Area System Plan, which set national targets and a vision for Protected Areas in the Kingdom. Under the Saudi Green Initiative (SGI), the Kingdom has committed to protecting 30% of its terrestrial and marine areas and is working in partnership with leading international organizations such as the IUCN to safeguard and restore the country's natural ecosystems and landscapes.

According to the World Database on Protected Areas (2024), supplemented by the national database, there are currently a total of 36 designated Protected Areas in the Kingdom. These cover 361,145 km² of terrestrial area (18.1%) and 14,382 km² of marine habitat (6.45%)

The conservation status in the Kingdom shows significant progress with more areas being proposed and/or being in the process of becoming formally protected areas.

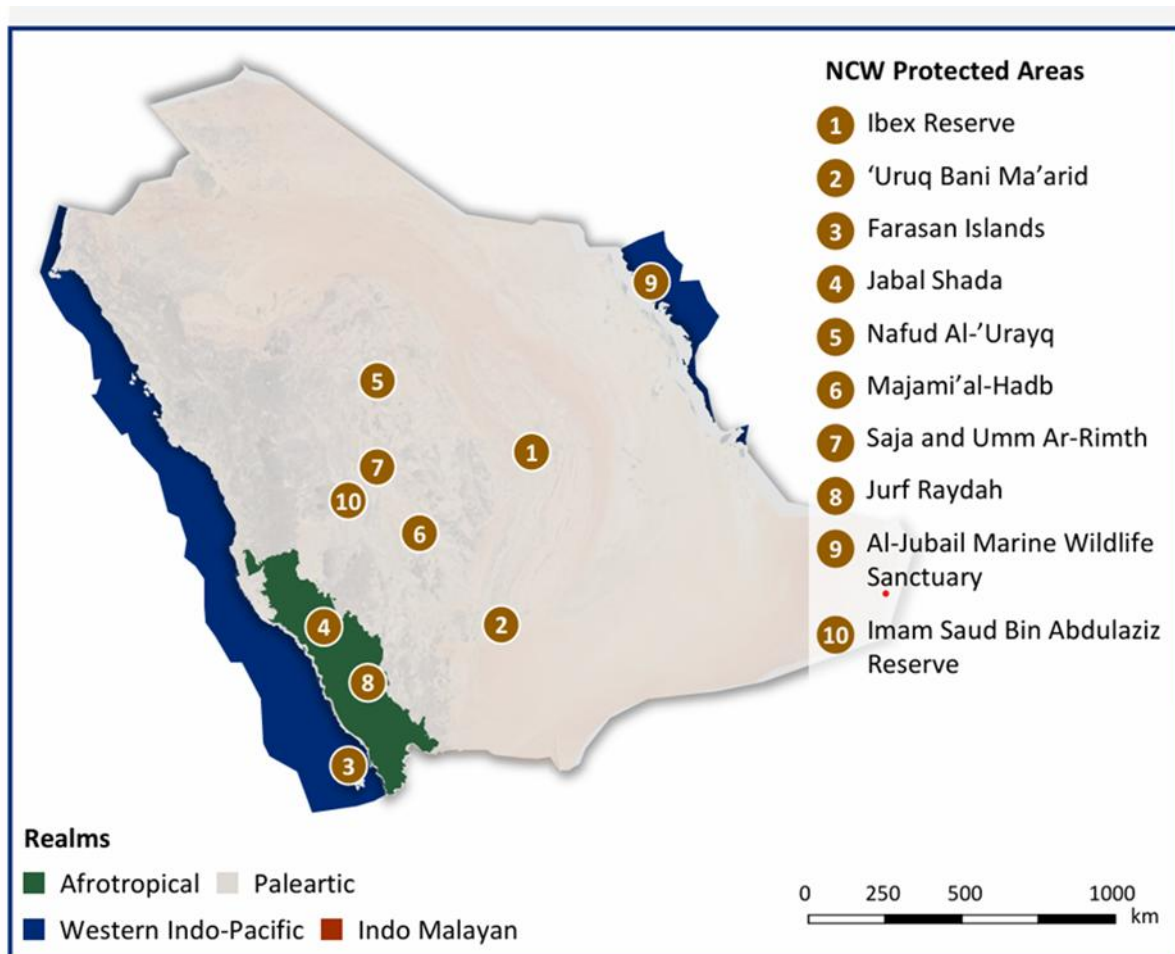
The Protected Areas in Saudi Arabia are managed by different authorities, including the National Centre for Wildlife (NCW), which has under its umbrella the 10 areas for which Management Plans are currently being compiled.

1.4. INTRODUCTION TO THE 10 PROTECTED AREAS

The 10 areas for which Management Plans are currently being compiled each address specific conservation elements that have been identified in the national System Plan. They complement each other through their different size, topography, landscapes, ecosystems, and biodiversity.

Table 1: Brief characterization of the 10 Protected Areas.

NAME OF PA	YEAR OF PROCLAMATION	SIZE KM ²	MAJOR ECOREGION PROTECTED	Ecosystem TYPES PROTECTED
<i>Al-Jubail Marine Wildlife Sanctuary</i>	1987	2,410	Southern Arabian Gulf	Arabian Gulf Coastal Plain
<i>Ibex PA</i>	1987	1,840	Jabal Tuwayq	Rawdahs
<i>'Uruq Bani Ma'arid</i>	1992	13,485	Arabian sand desert	Jabal Tuwayq
<i>Farasan Islands</i>	1988	5,786	Southern Red Sea	Southern Tihamah Coastal Plain
<i>Jabal Shada</i>	2002	78	Southwest Arabian Escarpment Shrublands and Woodlands	Asir Escarpment Crest Juniper Woodlands, Asir Escarpment Slope, Lower Asir Escarpment, Tihamah Foothills
<i>Majami' al-Hadb</i>	1991	1,190	Hijaz Hills & Mountains	Pyroclastic Outcrops
<i>Saja and Umm Ar-Rimth</i>	1994	6,528	Najd Pediplain	Inland Sabkhahs
<i>Jurf Raydah</i>	1988	9.95	Asir Escarpment Crest	Asir Escarpment Slope
<i>Imam Saud Bin Abdulaziz PA</i>	1987	2,240	Najd Pediplain	Central Harrahs – Old
<i>Nafud Al-'Urayq</i>	1994	2,034	Arabian sand desert	Granitic outcrops



Source: NCW Data, ICS Analysis and Oliver Wyman Analysis

1.5. OVERVIEW OF CONDUCTED FIELD STUDIES

Two field visits were undertaken, a preliminary one on 25/10/2023 and a follow-up visit from 25/02/2024. The visits were led by the National Center for Wildlife (NCW) and focused on consultations and site visits. The technical experts on those visits covered the disciplines of ecology and biodiversity conservation, Protected Area planning, including financial and organizational aspects, law enforcement, tourism planning and development, and stakeholder consultation.

threat and risk assessment was conducted, incorporating discussions with PA staff, management, field visits, and analysis of current management plans, maps, and geographical data. This process identified the prevalence and impact of threats, created a risk-level profile, and examined underlying causal factors and potential mitigation strategies. Additionally, on-site evaluations with rangers offered insights into the immediate pressures on specific locations and the limitations of current patrol strategies. A terrain, time, and distance appreciation exercise was undertaken to understand the size of the PA, its terrain and topography challenges as they relate to law enforcement, and the various threats and challenges.



SECTION TWO: LEGAL STATUS AND POLICY FRAMEWORK

2.1. CURRENT AND FUTURE POLICY FRAMEWORK

2.1.1. LEGAL SETTING

The Kingdom has promulgated various Royal Decrees concerning the establishment and management of protected areas and directs the Ministry of Environment, Water, and Agriculture through the National Centre for Wildlife for their implementation.

The National Environment Law no 62300 dated 21-11-1441H and its subsidiary Protected Areas Regulations no 48824-1-1443 dated 5-2-1443H, articulate the definition of protected areas and the set of guidelines, and procedures of their establishment, management, and monitoring.

Together with the new Environmental Law, the Ministry of Environment, Water, and Agriculture (MEWA) is the focal point for all environmental organizations. Five Centres now have responsibility for the protection and management of the wider environment:

- National Centre for Environmental Compliance (NCEC);
- The National Centre for Wildlife (NCW);
- The National Centre for Waste Management (NCWM);
- The National Meteorological Centre;
- The National Centre for the Development of Vegetation Cover and Combatting Desertification (NCDVCCD).

The main legal instrument that is relevant to the establishment of the Jabal Shada Protected Area is the "Executive Regulations for Protected Areas for the Environment System issued by the Royal Decree No. (M/165) on 19/11/1441 H. This Decree grants NCW executive privilege to apply the provisions of the Decree to all protected areas administered or supervised by the Center within the Territory of the Kingdom, and also for the issuing of licenses for private reserves, per the requirements and controls it sets.

2.1.2. DIRECTIVES FOR PROTECTED AREA MANAGEMENT

Article 5 of the same Executive Regulations relates to the regulations governing the management of Protected Areas with the main directives being:

- 1) The NCW issues a decision to appoint a team of NCW staff to manage each protected area, including powers, competencies, administrative controls, financial resources, decision-making mechanisms, etc.
- 2) The management team prepares and updates the management plan for the protected area to achieve the sustainable development and accreditation of living organisms, habitats, and biodiversity from the Centre, and identifies all aspects of management, including protection ranges within the protected area.
- 3) The NCW should appoint a supervisory board for any protected area that includes and is not limited to representatives from the Centre, researchers, environmental associations, and the community located in the vicinity of the protected area; the decision to appoint includes the functions and powers of this council.

- 4) The NCW should fence what it sees as sites within protected areas and must develop landmarks indicating the boundaries of the protected area and guidelines setting out the objectives and scopes of protection in accordance with the management plan.
- 5) The NCW will establish the necessary facilities in each protected area in accordance with the protected area management plan.

2.1.3. INSTITUTIONAL

NCW Mandate - Jabal Shada is currently managed by the NCWCD's successor, the National Center for Wildlife (NCW) which was established in 2019 (Cabinet Decree Number 417) with a new and enlightened mandate and mission statement* as part of the transformation of the Kingdom's environmental sector.

*NCW Mission Statement: "Preserving and developing wildlife, biodiversity, and ecosystems by enhancing community participation through comprehensive and effective programs to achieve environmental sustainability and maximize social and economic benefits".

A National Registry for Protected Areas: Since 2021 a National Register for protected areas has been established with the issuance of the Royal Decree No. 26384 dated 22/4/1441 H (27/11/2021 G) instructing the registration and designation of all protected areas in the Kingdom to be undertaken by the NCW of the Ministry of Environment, Water and Agriculture (MEWA).

The schematic flowchart below illustrates the process for the designation and registration of protected areas in KSA:

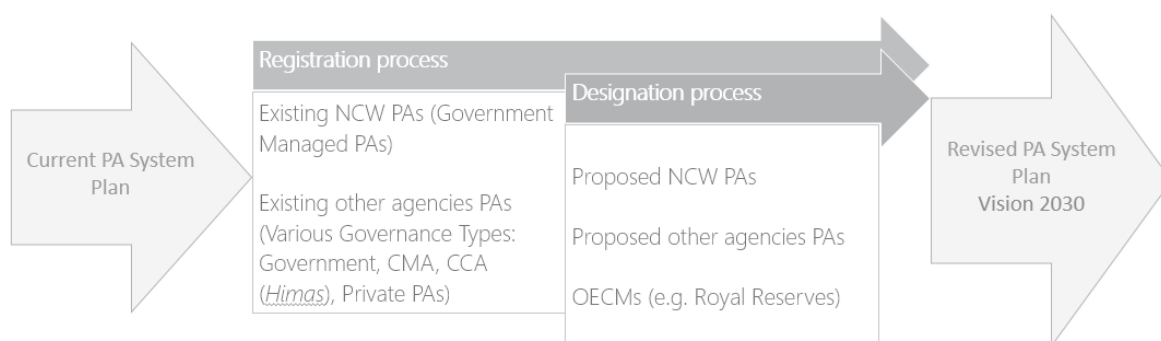


Figure 1: Designation and registration process for PAs in KSA

LAWS, REGULATIONS, GUIDELINES, AND PLANS THAT SUPPORT THE MANAGEMENT OF JABAL SHADA PROTECTED AREA

The principles of Islam that include consideration of environmental protection and sustainability are enshrined within the legislation and constitution of Saudi Arabia. Article 32 of the Constitution of the Kingdom of Saudi Arabia says: "The State shall endeavor to preserve, protect and improve the environment and prevent its pollution."

In 2020, Saudi Arabia announced new comprehensive environmental legislation to repeal the old General Environmental Regulations (GER) that were enacted in 2001 and revised in 2011. The new so-called 'Environmental Law' came into force on the 17 January 2021. The law is accompanied by several implementing regulations that cover the major environmental issues applicable to the Kingdom. In addition to the Environmental Law and its Executive Regulations including Executive Regulations for Protected



Areas, Environmental Rehabilitation of Degraded Sites and Remediation of Polluted Sites, Vegetation Cover Development and Combating Desertification, Trade in Wildlife Species, Their Products, and Derivatives; the list below provides additional legal and conservation instruments that are critical for protecting and ensuring sustainable use of wildlife and their habitats.

- i) Jabal Shada Protected Area Establishment Decree.
- ii) National Biodiversity Strategy and Action Plan.
- iii) Law of Endangered wild species and their products trafficking.
- iv) Law of antiquities, museums and urban heritage 2014.
- v) Law of Hunting Wild Animals and Birds and Executive Regulation for Hunting Terrestrial Wildlife Species.
- vi) Law of Municipalities and Rural Areas 1977.
- vii) Tourism Law and its implementation regulations.
- viii) Cultural Heritage Law.
- ix) National Protected Areas System Plan.
- x) The Agriculture Law and its Implementing Regulation.
- xi) Waste Management Law 2021 and its Executive Regulations
- xii) And Others, that are related to the management of the Protected Area and its resources.

The main legal instrument that is relevant to the establishment of Jabal Shada Protected Area is the "Executive Regulations for Protected Areas for the Environment System issued by the Royal Decree No. (M/ 165) on 19/11/1441 H.

This Decree grants NCW executive privilege to apply the provisions of the Decree to all protected areas administered or supervised by the Centre, within the Territory of the Kingdom, and for the issuing of licenses for private reserves, in accordance with the requirements and controls it sets.

2.1.4. ESTABLISHMENT HISTORY

Legal Gazettment: Conservation status for Jabal Shada was declared as a Special Nature Reserve (1a Strict Nature Reserve) in 2002 (no decree discovered) presumably by the National Commission for Wildlife Conservation and Development (NCWCD) Board of Governors. This followed a survey of the site in 2001 by the NCWCD (*Reconnaissance Survey of Jabal Shada* July 2001. Wachter T. and Al Aqeel, K. NCWCD field report).

The site is comprised of the two peaks Jabal Shada al-A'la and Jabal Shada Al-Asfal but is generically referred to as Jabal Shada. Though the outer boundary of Shada Al-A'La encloses 78 km², taking into account the agricultural enclaves (terraces, farms, and villages) that are excluded from the protected area, the PA's effective area is around 72 km² (72 km² reported by Protected Planet). However, given the steep gradient of the site, the actual conserved surface area is likely to be larger.

Jabal Shada is currently managed by the NCWCD's successor, the National Center for Wildlife (NCW) which was established in 2019 (Cabinet Decree Number 417) with a new and enlightened mandate and mission statement* as part of the transformation of the Kingdom's environmental sector.



*NCW Mission Statement: “Preserving and developing wildlife, biodiversity, and ecosystems by enhancing community participation through comprehensive and effective programs to achieve environmental sustainability and maximize social and economic benefits”.

2.1.5. PROTECTED AREA POLICY ENVIRONMENT

The Kingdom's revised protected area system plan, being readied for publication in 2024, outlines the process guiding the development of Saudi Arabia's national system of protected areas. The Plan recognizes that individual protected areas are the foundation of the system plan and collectively they help to balance the system plan's different conservation objectives.

The plan identifies the following objectives for a protected area's management:

- Conserve the composition, structure, function, and evolutionary potential of biodiversity.
- Contribute to regional conservation strategies (as core reserves, buffer zones, corridors, stepping-stones for migratory species, etc.).
- Maintain diversity of landscapes or habitats and their associated species and ecosystems.
- Be of sufficient size to ensure the integrity and long-term maintenance of the specified conservation targets or be capable of being increased to achieve this end.
- Maintain in perpetuity the values for which it was assigned.
- Be operating under the guidance of a management plan, and a monitoring and evaluation program that supports adaptive management; and
- Have a clear, effective, and equitable governance system.

2.1.6. INTERNATIONAL AGREEMENTS

Though an isolated mountain massif in the Tihamah foothills, Jabal Shada supports an exceptionally rich flora of over 500 plant species, around 22% of the Kingdom's known flora; it is the site of the highest botanical diversity recorded in Saudi Arabia, including Afrotropical relicts and several endemic species and subspecies.

The PA forms an important and biodiverse bioclimatic refuge situated on the highest points in Saudi Arabia and provides suitable habitat for a significant number of Saudi Arabia's endemic and near-endemic species of birds and plants.

Important Bird Area. Shada Al-A'La lies within the South Western Endemic Bird Area defined as an area that encompasses the overlapping breeding ranges of restricted-range species (<https://datazone.birdlife.org/eba/results>). Most of the endemic birds of southwestern Arabia are expected to inhabit the site. The PA would therefore likely qualify individually as an Important Bird Area based on the following IBA criteria: A1. Globally threatened species, A2. Restricted-range species, A3. Biome-restricted species, B1: Species of conservation concern, B2: Species with most of their range restricted to a region B3: Regionally important congregations– bottleneck sites.

Important Plant Area. Over 100 provisional Important Plant Area (IPA) sites have been identified in Saudi Arabia, Oman & Yemen. The Centre for Middle Eastern Plants (CMEP) is engaged with project partners in surveying and producing final assessments of these sites as IPAs (*Important Plant Areas in Arabia* / Centre for Middle Eastern Plants (cmep.org.uk)).

IPA programs are a response to Target V of the Global Strategy for Plant Conservation. Data from IPA habitat and species surveys is intended to inform this conservation planning process. In Saudi Arabia, several IPA sites have been proposed as protected areas though to date full site assessments have been published on just four sites.



CMEP has developed criteria for IPA selection in Arabia in association with the IUCN Arabian Plant Specialist Group. Criteria for the Arabian region specifically include relict species and refugia for connectivity and climate change mitigation. Several endemic plants are found in Jabal Shada, or in the case of *Euphorbia* sp. aff. *parciramulosa* which is only known from this site. Jabal Shada would certainly qualify for IPA status.

Key Biodiversity Area. Jabal Shada is a confirmed Key Biodiversity Area (KBA) which was last assessed in 2011 (<https://www.keybiodiversityareas.org/site/factsheet/29728>). The rationale for Shada qualifying as a KBA is as follows: 'This site qualifies as a Key Biodiversity Area of international significance because it meets one or more previously established criteria and thresholds for identifying sites of biodiversity importance (including Important Bird and Biodiversity Areas, Alliance for Zero Extinction sites, and Key Biodiversity Areas) KBA identified in the process of compiling the CEPF Ecosystem Profile of the East Afromontane Hotspot. Species taxonomy and threat category were based on the IUCN Red List 2010-4. The site holds a significant population of the following plant species which, although not yet Red-List-assessed at the global level, are endemic to the Hotspot (those with particularly restricted ranges are tagged with Irr1, i.e. meeting the KBA Irreplaceability 1 criterion) and may be categorized as globally threatened once assessed (thus meeting the KBA Vulnerability criterion), based on existing regional or national Red List assessments: *Acacia johnwoodii*, *Aloe sabaea*, *Centaurothamnus maximus*, *Crinum album* (Irr1), *Silene asirensis*.

Man and Biosphere: The close juxtaposition of settlements and agricultural activities within an area of high conservation value may make the Jabal Shada protected area a suitable candidate for MAB Biosphere Reserve status.

World Heritage Nomination: Jabal Shada has been tentatively nominated to be included as one of seven elements of a potential serial World Heritage Site comprised of the most outstanding bioclimatic refugia in Western Arabia. This proposed Bioclimatic Refugia of Western Arabia serial site will include the most important mountain crests, woodlands, and wetlands that harbor relict assemblages of plant and animal species in the western part of the Arabian Peninsula. As relatively cool, moist "islands" in a predominantly arid and semiarid subcontinent, they represent the most outstanding hotspots of terrestrial biodiversity and the most important sites for endemism, reliction, and speciation, as well as the most critically vital sites to conserve these processes under the pressures of global climate change.

This serial site would span the length of the Sarawat mountains within Saudi Arabia, from the Yemen boundary to the Jordan boundary. The serial site was submitted to be included on Saudi Arabia's Tentative List for Nomination UNESCO on 23/01/2023 as a Natural Site on Criteria vii, ix, and x.

If this serial site, including Jabal Shada, is to be accepted and inscribed as a WHS, Saudi Arabia would have certain international obligations towards its protection, conservation, and management. Key obligations will include:

1. **Protection and Conservation:** States Parties are responsible for ensuring the protection, conservation, and preservation of the cultural and natural heritage sites within their boundaries. This includes taking appropriate legal, scientific, technical, administrative, and financial measures to safeguard these sites.
2. **Management and Planning:** Developing and implementing management plans that outline strategies for the conservation, presentation, and sustainable use of World Heritage Sites is essential. These plans should involve stakeholders, local communities, and experts to ensure effective management.
3. **Monitoring and Reporting:** States Parties are required to monitor the state of conservation of their World Heritage Sites and report regularly to UNESCO on their condition, any threats or changes, and the measures taken to address them.
4. **Legal Protection:** Putting in place legal frameworks and regulations to safeguard the sites from potential threats such as urbanization, pollution, natural disasters, climate change, and unauthorized developments. This may involve establishing buffer zones, legal protections, and regulations governing the use of the site.



5. **Public Awareness and Education:** Promoting public awareness and understanding of the importance of World Heritage Sites, their significance, and the need for their protection. This often involves educational programs, interpretation centers, and community engagement initiatives.
6. **International Cooperation:** Collaborating with other States Parties, international organizations, and stakeholders to exchange information, expertise, and resources for the conservation and management of World Heritage Sites.
7. **Emergency Measures:** Taking immediate action in case of emergencies or sudden threats to the sites, such as natural disasters or armed conflicts, to minimize damage and ensure their recovery.

Each country's specific obligations and strategies for fulfilling them may differ based on the unique characteristics of their World Heritage Sites and their national capacities. In the case of Jabal Shada, consideration of local tribal usufruct rights will be paramount with the presence of Ghamid members in the higher settlements, and Zahranis concentrated in the lower northwestern settlements. The presence of the current and former *himas* of al-Kibasah, as-Salatin, and as-Sur, and their possible gazetting and revival, would also be important governance issues.

2.2. IUCN GREEN LIST STANDARDS

The delineation, proclamation, and control of a Protected Area does not automatically signify that the management thereof is up to the required standard. IUCN has developed a global standard that sets a benchmark for how to meet the environmental challenges of the 21st century (IUCN, 2019). A protected area that reaches the IUCN Green List Standard is certified and recognized as achieving ongoing results for people and nature fairly and effectively. At the heart of the IUCN Green List Program is a Sustainability Standard, which has global applications. The Green List describes a set of seventeen CRITERIA categorized under four COMPONENTS, accompanied by 50 INDICATORS, for successful conservation in protected areas. It provides an international benchmark for quality that motivates improved performance and helps achieve conservation objectives. By committing to meeting this global standard, site managers seek to demonstrate and maintain performance and deliver real nature conservation results.

Table 2: IUCN Green List Standards

COMPONENT 1: GOOD GOVERNANCE	
<i>Green List sites demonstrate equitable and effective governance.</i>	
<i>Criterion 1.1: Guarantee Legitimacy and Voice</i>	There are clearly defined, legitimate, equitable, and functional governance arrangements, in which the interests of civil society, rights-holders, and stakeholders, are fairly represented and addressed, including those relating to the establishment or designation of the site.
<i>Criterion 1.2: Achieve Transparency and Accountability</i>	Governance arrangements and decision-making processes are transparent and appropriately communicated, and responsibilities for implementation are clear, including a readily accessible process to identify, hear, and resolve complaints, disputes, or grievances.
<i>Criterion 1.3: Enable Governance Vitality and Capacity to Respond Adaptively</i>	Planning and management draw on the best available knowledge of the social and ecological context of the site, using an adaptive management framework that anticipates, learns from, and responds to change in its decision-making.
COMPONENT 2: SOUND DESIGN AND PLANNING	
<i>Green List sites have clear, long-term conservation goals and objectives, based on a sound understanding of their natural, cultural, and socio-economic values and context.</i>	
<i>Criterion 2.1: Identify and Understand Major Site Values</i>	The site's major values for the conservation of nature with associated ecosystem services and cultural values are identified and understood.
<i>Criterion 2.2: Design For Long - Term Conservation of Major Site Values</i>	The design of the site in its landscape/seascape context supports long-term maintenance of the major site values.



<i>Criterion 2.3: Understand Threats and Challenges to Major Site Values</i>	Threats and challenges to major site values are described and understood in sufficient detail to enable effective planning and management to address them.
<i>Criterion 2.4: Understand the Social and Economic Context</i>	The social and economic context of the site including the positive and negative social and economic impacts of the way it is managed is understood and reflected in site management goals and objectives.
COMPONENT 3: EFFECTIVE MANAGEMENT	
<i>Green List sites are managed effectively.</i>	
<i>Criterion 3.1: Develop and Implement a Long-Term Management Strategy</i>	<p>The site has a long-term strategy that provides a clear explanation of the overall goals and objectives of management (explicitly including the conservation of the area's major values and achievement of its social and economic goals and objectives). This is reflected in an up-to-date management plan or its functional equivalent, which:</p> <ul style="list-style-type: none"> • Provides clear and appropriate management directions: Strategies and actions specified in plans, policies, and procedures are appropriate and sufficient to achieve the planned goals and objectives for the area. • Demonstrates adequate capacity to manage effectively: Key strategies and associated activities to achieve goals and objectives in the long-term are supported by adequate financial and human resources, adequate staff competency, capacity development, and training; appropriate access to equipment and adequate Infrastructure; and measures are in place to deal with critical shortfalls.
<i>Criterion 3.2: Manage Ecological Condition</i>	The site can clearly demonstrate that ecological attributes and processes are being managed to maintain the site's major natural values with associated ecosystem services and cultural values.
<i>Criterion 3.3: Manage Within the Social and Economic Context of the Site</i>	<p>Management can clearly demonstrate that:</p> <ul style="list-style-type: none"> • Rights-holders and stakeholders are recognized and engaged effectively by management, and their interests are fairly and fully considered. • The social and economic benefits of the area are recognized, promoted, and are being maintained, OR, where such maintenance is incompatible with the maintenance of the area's natural values, any restrictions are designed and implemented in consultation with, and preferably following the free, prior and informed consent of right-holders and stakeholders.
<i>Criterion 3.4: Manage Threats</i>	Threats are being actively and effectively responded to so that their impact is not compromising the maintenance of major site values or the achievement of the area's goals and objectives.
<i>Criterion 3.5: Effectively and Fairly Enforce Laws and Regulations</i>	Relevant laws, regulations, and restrictions are fairly and effectively applied in all aspects of the protected area management and operations.
<i>Criterion 3.6: Manage Access, Resource Use and Visitation</i>	When permitted, activities within the area that involve direct access to resources are compatible with and support the achievement of the area's conservation goals and objectives, meet the needs of users, and are properly regulated. When permitted, tourism and visitor management are compatible with and support the achievement of the area's conservation goals and objectives.
<i>Criterion 3.7: Measure Success</i>	<p>Monitoring, evaluation, and learning provide an objective basis for determining measures of success. Monitoring and assessment programmes should be capable of providing data on:</p> <ul style="list-style-type: none"> • Whether each of the site's major values is being successfully protected.



- Level and intensity of threats; and
- Achievement of management goals and objectives.
- As appropriate, thresholds may be determined by changes in major values over a specified period compared to those anticipated without the protected and conserved area.

COMPONENT 4: SUCCESSFUL CONSERVATION OUTCOMES

Green List sites demonstrate successful long-term conservation of major natural values and associated cultural and ecosystem service values, as well as the achievement of social and economic goals and objectives.

Criterion 4.1: Demonstrate Conservation of Major Natural Values

The area is meeting or exceeding the performance thresholds for nature conservation, consistent with its IUCN-protected area management category.

Criterion 4.2: Demonstrate Conservation of Major Associated Ecosystem Services

The area is maintaining and providing the major ecosystem service values.

Criterion 4.3: Demonstrate Conservation of Major Cultural Values

The area is maintained and provides for the persistence of major cultural values.

Source: IUCN Green List Standards¹

2.3. MANAGEMENT PLAN PA-SPECIFIC FRAMEWORKS

Two broad approaches, ecosystem restoration, and adaptive management, form the framework for the management of the Jabal Shada protected area, with the green listing standards as the target outcomes.

2.3.1. ECOSYSTEM RESTORATION FRAMEWORK

The United Nations Decade on Ecosystem Restoration defines ecosystem restoration as “the process of halting and reversing degradation, resulting in improved ecosystem services and recovered biodiversity. Ecosystem restoration encompasses a wide continuum of practices, depending on local conditions and societal choice.” This broad scope of restoration activities generally aligns with the activities described as restorative in the Restorative Continuum.

¹ <https://iucngreenlist.org/standard/global-standard/>

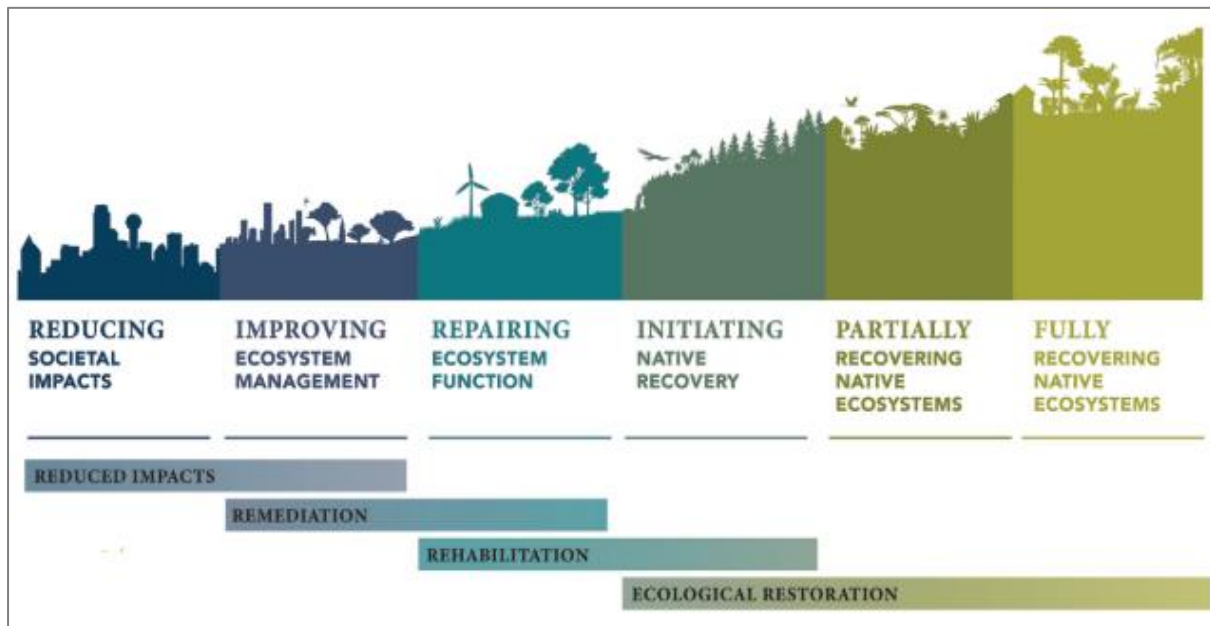


Figure 2: The restorative continuum from (Gann, 2019).

The framework promotes ten principles namely: good ecosystem restoration 1) contributes to global policy frameworks; 2) promotes fair and inclusive engagement; 3) includes a continuum of restorative activities; 4) aims at the highest recovery possible to benefit nature and people; 5) addresses the causes of degradation; 6) incorporates all types of knowledge; 7) sets ecological, cultural and socio-economic goals; 8) tailors activities to local and land/seascape contexts; 9) measures results and adapts actions; and 10) integrates policies and measures for lasting impacts.²

Since the paths and eventual outcomes of ecosystem restoration have in many cases no known reference framework or endpoint, restoration activities are best implemented through 'adaptive management'.

2.3.2. ADAPTIVE MANAGEMENT

Adaptive management is a decision process that promotes flexible decision-making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. It is particularly well suited to environmental management where conditions change (e.g. good rains or drought) and outcomes are unpredictable. Key points of this approach are:

- Adaptive management openly acknowledges uncertainty about how ecological systems function and how they respond to management actions.
- Adaptive management is designed to improve understanding of how a system works, to achieve management objectives.
- Adaptive management is about taking action pursuant to desired outcomes.
- Adaptive management requires the participation of stakeholders

A full guide to the implementation of adaptive management may be found in (Salafsky, 2001). Adaptive management is seen as a dynamic cyclical process that continually learns and improves group understanding as one implements, monitors outcomes, analyses, learns, and then adapts management to improve the achievement of desired outcomes.

² <https://www.ser.org/news/579457/Ten-Principles-Underpin-Good-Ecosystem-Restoration-throughout-the-United-Nations-Decade-2021-2030.htm>

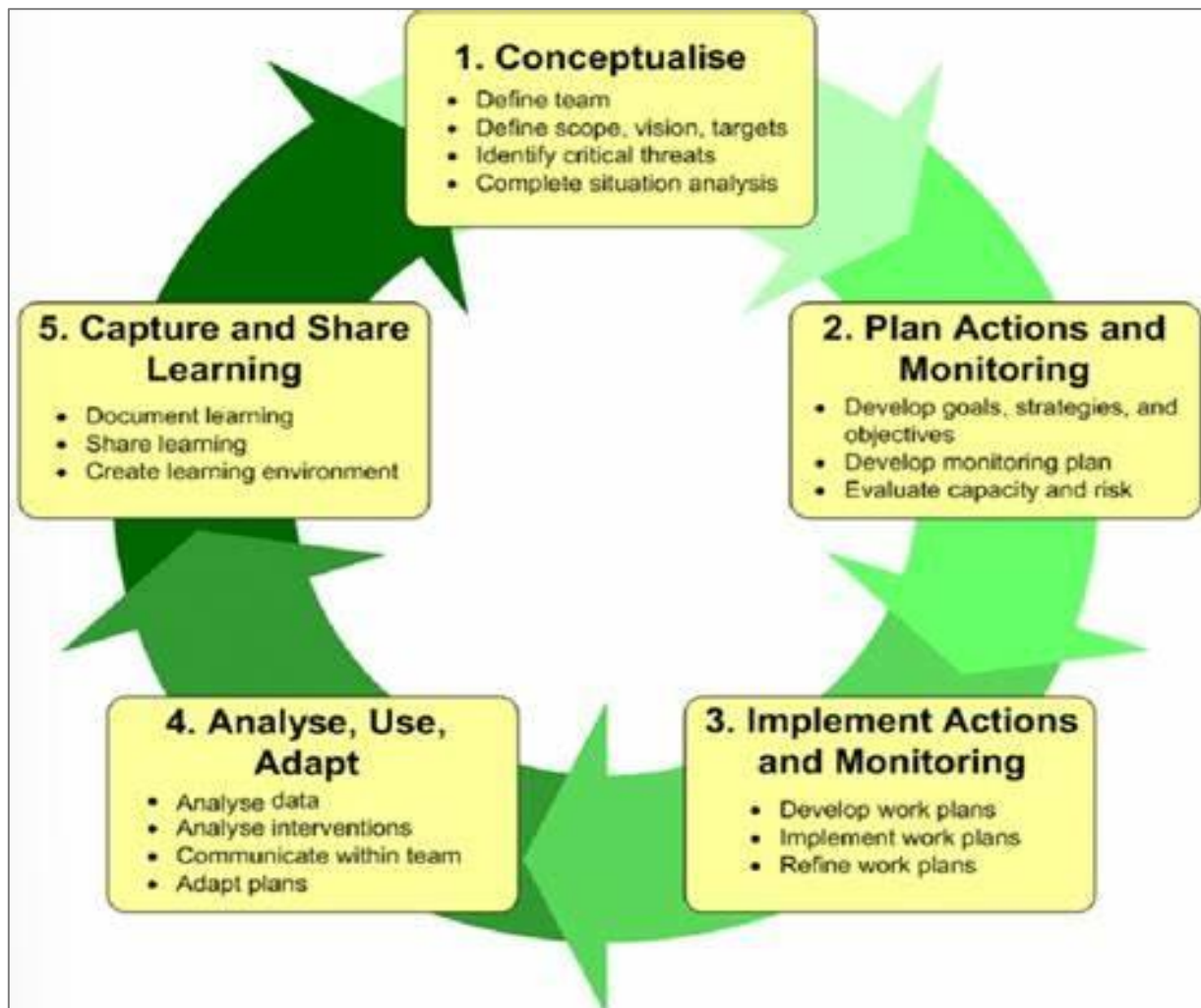


Figure 3: The 'Open Standards' Adaptive management cycle (CMP, 2020)



SECTION THREE: PROTECTED AREA ASSESSMENT

3.1. INTRODUCTION AND OVERVIEW OF THE JABAL SHADA PROTECTED AREA

3.1.1. OVERVIEW

Jabal Shada Protected Area lies approximately 76 km² from the city of Al-Baha within the Al-Baha province of Saudi Arabia. It is located within the Al-Mebkwa District, the most southern district of the province. Jabal Shada is an outlier of the Sarawat Escarpment in the Tihamah foothills. It is comprised of a granite massif with spectacular scenery comprising jagged spires and pinnacles.

Table 3: Overview of Jabal Shada Protected Area

ORIGINAL NAME:	JABAL SHADA PROTECTED AREA
<i>English Designation</i>	Protected Area
<i>IUCN Management Category</i>	Currently, Jabal Shada is designated as IUCN Management Category II ³ .
<i>Status</i>	Designated
<i>Type of Designation</i>	National
<i>Status Year</i>	1992
<i>The primary aim of the establishment</i>	Outstanding plant diversity, carnivores, endemic birds, and the reported presence of Arabian leopard, as well as spectacular scenery and traditional agricultural terraces (Llewellyn, 2013)
<i>Size</i>	76 km ² with approx.

Elevation varies from a minimum of 450 m to a maximum of 2149 m above sea level (m asl), and the terrain is dominated (~75%) by very steeply sloping (>30% slope) ground, with less than 1% comprising flat to gently sloping ground. Soils are derived from the underlying granite, shallow, poorly formed alkaline sandy loam lithosols.

The vegetation on the lower slopes is open woodland dominated by *Acacia spp.*, at mid-elevation (*Adenium-Grewia* community on alkaline soils). The *Olea europaea* community grows at the elevation of 1,500 m – 2,100 m asl, grading into a patchy *Juniperus procera* – *Barbeya oleoides* woodland community with *Teclea nobilis*, *Acokanthera schimperi*, *Myrsine africana*, *Jasminum grandiflorum*, *Pistacia falcata*, *Tarenna graveolens*, and *Dodonaea angustifolia*, among large boulders at the mountain's summit (Llewellyn, 2013). North-facing ravines support patches of lush valley forest, characterized by trees such as *Breonadia salicina*, *Mimusops laurifolia*, *Ficus sycomorus*, *F. ingens*, *Diospyros mespiliformis*, *Ziziphus mucronata*, and *Z. spina-christi*. The site is rich in succulent asclepiads and aloes. The PA has a species-rich flora with Afrotropical relicts and several endemic species and subspecies.

The birds have not been fully inventoried, but Griffon vultures *Gyps fulvus* nest (?) on the mountain; large flocks of the endemic Arabian waxbill *Estrilda rufibarba* have been recorded around settlements and coffee fields, and most of the endemic birds of southwestern Arabia are expected to inhabit the site.

The mammalian fauna has been depleted but Rock hyrax *Procapra capensis syriaca* and Hamadryas baboon *Papio hamadryas* are common on the mountain. Several carnivores have been recorded in the past, including the hoary fox *Vulpes cana*, the Arabian red fox *Vulpes vulpes arabica*, caracal *Caracal caracal schmitzi*, striped hyaena *Hyaena hyaena sultana*, Arabian wolf *Canis lupus arabs*, and small-spotted genet *Genetta genetta granti*. Indian crested porcupine *Hystrix indica* are reported. Leopards were also reported in the past but are now deemed locally extinct.

³ A IUCN Category II area is similar to a wilderness area in its size and its main objective of protecting functioning ecosystems.



Cultural assets include well-built stone buildings and agricultural terraces; the small mosque of Ibrahim (musalla Ibrahim) rock paintings within small caves. More recently a distinctive variety of coffee is grown on traditional terrace farms on Jabal Shada, along with other crops, including peaches, sorghum, millet, and barley. Bananas are grown in the lowlands. Goats are grazed on the mountain, as well as a few cattle and sheep.

Jabal Shada is unlike other PAs in that it has communities living within the heart of the area at the base of the main mountain massif and along the road that accesses it. It is understood that the boundaries of this area of private land are well understood.

3.1.2 ADMINISTRATIVE FEATURES

Reasons for Protection:

The reasons given for the establishment of the PA are the outstanding plant diversity, carnivores, endemic birds, reported past presence of Arabian leopards, spectacular scenery, and traditional agricultural terraces.

Management Objectives:

The initial management objectives documented for the PA (Llewellyn, 2013) are as follows:

- Maintain unique biologically diverse and productive woodland ecosystems.
- Conserve and restore populations of threatened species, including Arabian leopards and rock foxes.
- Preserve endemic and near-endemic plants and birds.
- Maintain relict and other plant communities without degradation.
- Safeguard the site's watershed and soil-forming processes.
- Restore degraded habitats.
- Enable local communities to benefit through the sustainable production of wild honey.
- Provide opportunities for scientific research, environmental education, sustainable nature-based recreation, and ecotourism.

Tenure:

- State / private.

Size and Sectors:

The area encompassed by the outer boundary of the PA is 76 km². This area includes a 12.7 km² sustainable use zone and an intensive use zone of 0.2 km². The existing sustainable use zone defines areas of established human settlement and agriculture, while the intensive use zone encompasses administrative buildings and intensive tourism developments.

Imarahs / Districts: Al-Bahah Imarah, (Al-Mukhwah and Qilwah Districts).

Nearest Cities (Population Over 100,000): Al-Bahah.

Nearest Towns: Al-Mukhwah, Qilwah.

Boundary Definition / Demarcation:

- The northeastern boundary follows the edge of private properties along the Qilwah-Al-Mukhwah road, excluding villages and farmlands.



- Southeastern and southern boundaries follow the road from Malil to Jabal Shada al-Asfal and the village of Ahad al-Qafarah.
- The western boundary follows the limit of private property along the east side of Wadi Nira, excluding villages and farmlands.
- The northwestern boundary follows the eastern/southern side of the road from Bun Na'man to al-Ja'dan. Villages, farms, and private properties are excluded as agricultural enclaves.
- Generally well-defined by topographic features and roads; concrete stelae are posted at intervals within view of one another along the outer boundary.

Rangers / Other Staff:

- The Protected Area Manager has an office in the administrative building of the Al-Bahah Imarah.
- Sixteen rangers are deployed in Jabal Shada al-A'la, including the Head of Patrol Unit and his deputy.
- Two cooks are employed.

3.1.3 SOCIO-ECONOMIC PROFILE

3.1.3.1 LOCAL CONTEXT

Jabal Shada's socioeconomic landscape is shaped by its numerous villages and agricultural enclaves, where coffee, fruits, grains, and livestock grazing are key economic activities. Communities, both within and around the reserve, face challenges like youth migration, school closures, and fluctuating crop viability. Tribal groups, including the Ghamid and Zahran, maintain cultural ties and traditional land-use practices, contributing to the area's agricultural terraces and conservation heritage.

While there is potential for rural development through eco-tourism, wild honey production, and environmental education, the region faces threats from settlement expansion, road construction, overgrazing, and invasive species. Local concerns include the sustainability of coffee farming and perceived conflicts with conservation efforts. Growth opportunities lie in revitalizing traditional conservation practices, enhancing tourism, and addressing community needs to ensure balanced development.

3.1.3.2. REGIONAL CONTEXT

Al Baha, home to Jabal Shada PA, is rich in natural resources and a popular tourist destination, known for its cool climate and diverse landscapes. Its cultural heritage, including architecture, crafts, and folk arts, contributes to the region's GDP and future economic growth. To promote sustainable development, programmes have been implemented to empower locals to create economic value from traditional crafts and resources, which also helps boost job creation and regional GDP.

For instance, families have been supported through beekeeping training in collaboration with the Beekeepers Cooperative Association, and a project to plant 50,000 tree seedlings was introduced to support bee populations. Honey production, a long-standing tradition in the area, generated SAR 1.8 million through annual festivals, attracting global partners.

In 2012, Al Baha's GDP was SAR 14.5 billion, contributing 0.53% to the national GDP, or 1% excluding crude oil and gas. From 2009 to 2012, the region's GDP grew at an average annual rate of 20%. Key sectors include trade (14.6%), real estate (13.3%), construction (9.8%), and agriculture (2.8%).

3.1.3.2.1. AGRICULTURE

Agriculture has traditionally been an important sector in the Al Baha region, contributing 2.8% to its GDP, ranking seventh in economic output. The region benefits from advantages like high water quality, ample



rainfall, and fertile soil, though farming practices are limited by the mountainous terrain. In 2011, Al Baha's cultivated land covered about 34 km², just 0.4% of the Kingdom's total crop area. No single crop produced in the region surpassed 1% of the national output. Locally, agriculture is shaped by terraced fields along mountains and wadis, with grazing lands in the south of Al Mekhoah and northeast of Aqiq. The region is also known for its pastoral lands and expertise in sheep farming. Notably, Al Baha's honey farms contribute approximately 5% to the Kingdom's total honey production.

3.1.3.2.2. TOURISM

The tourism sector in Al Baha holds a prominent position among the region's economic activities and has substantial growth potential. The area's natural beauty, diverse geography, historical sites, recreational spots, and sports activities are driving a rise in domestic tourism. This sector shows promise, especially if investments in hotels, guest houses, restaurants, and related services are boosted. Increased tourism has also led to higher demand for agricultural products, positioning the agricultural sector to expand crop production. This, in turn, could attract significant investments in food processing and manufacturing, benefiting related industries like equipment and machinery.

3.1.3.2.3. MINING

The region possesses significant raw materials and mineral wealth, including barite south of Aqiq, pyrite ores in Badia, feldspar and fluorite west of Wadi Turba, as well as ornamental stones like marble and granite in Wadi Turba and east of Leith. Other resources include silica sands, kainite, clay, and basalt. To fully exploit these resources, the mining sector requires infrastructure improvements such as roads and technical services. With the right investments, this sector has the potential to attract substantial investment and support diverse mining activities.

3.2. CONTEXT AND ACCESSIBILITY

- One hour's drive from Al Bahah, and 1:30h from the domestic airport (Saudi and Flynas offer flights to Riyadh, Abha, Dammam, and Jeddah)
- 4h30 from Abha, 4 hours from Mekkah, 3h30 from Taif
- All three cities have international airports
- The road into the PA to service resident communities
- The PA is not fenced and there is no access control
- Paved road to the base of Jabal Shada and beyond to high areas in the mountains PA
- Much of the PA is inaccessible by car due to the steep and rocky topography

3.3. MANAGEMENT RESOURCES AND INFRASTRUCTURE

3.3.1. FINANCIAL RESOURCES

The financial resources allocated to Jabal Shada Protected Area are primarily derived from government funding through the NCW.

3.3.2. HUMAN RESOURCES – STAFFING

Table 4: Current staffing

DEPARTMENT	QUANTITY	TITLE	ROLE
<i>Management</i>	1	Area Manager	Overall responsibility for the PA, strategic planning, and leadership.
<i>Rangers</i>	1	Head of Patrol Unit	Leads the ranger team, coordinates conservation activities, and oversees law enforcement.



DEPARTMENT	QUANTITY	TITLE	ROLE
	14	Rangers	Engaged in fieldwork including patrolling, monitoring wildlife, and enforcing PA regulations, stakeholder engagement, and the tourism program.

The daily operations of the staff at Jabal Shada Protected Area are primarily focused on patrolling, monitoring, and maintaining ecological and environmental integrity. The rangers, led by the 1 Area Manager and 1 Head of Patrol Unit, work in shifts to ensure coverage, typically operating five days on and two days off. Rangers patrol the PA using the 7 vehicles at their disposal, covering key areas of the park, focusing on sensitive zones such as wildlife habitats, areas prone to grazing, and visitor access points. Patrol densities are higher near the PA's boundaries and village enclaves to manage human-wildlife conflict, livestock grazing, and invasive species like Opuntia.

3.3.3. EQUIPMENT & VEHICLES

The 4x4 vehicles are essential for patrolling the PA's steep and rugged terrain, allowing rangers to access remote areas. Despite this fleet, the challenging landscape often limits vehicle access to certain parts of the PA, necessitating increased reliance on foot patrols in those areas. As outlined in the table below, the existing fleet of vehicles and PA equipment serves the operational needs,

Table 5: Current vehicles and equipment

QTY	CATEGORY	DESCRIPTION
7	Vehicles	<ul style="list-style-type: none"> 7 x Nissan Patrols All vehicles fitted with a Fleet Management System, incl. In-vehicle cameras. Connectivity via GSM and Satellite. All vehicles are fitted with 2-way radios.

3.3.4. INFRASTRUCTURE

The management infrastructure at Jabal Shada Protected Area revolves around a single operational ranger station, which supports the 12 rangers rotating 5-day shifts. This station handles patrolling, biodiversity monitoring, visitor management, and administrative tasks. The fleet consists of off-road 4x4 vehicles, allowing rangers to cover most areas, although some steep and rugged sections remain accessible only by foot patrols.

Clear boundary demarcation for the protected area, with concrete stelae and signs surrounding it. The main road, which services resident communities, is in relatively good condition despite the challenging terrain, allowing vehicles to reach higher sections of the mountains.

3.4. PHYSICAL ENVIRONMENT ANALYSIS

3.4.1. CLIMATE

The PA has a warm desert climate (Köppen BWh) with hot dry summers and mild dry winters at lower altitudes changing to a cold desert climate (Köppen BWk) at higher elevations and is characterized by cooler average temperatures. Average temperatures peak in June (28.3 °C) and are at their lowest in January (16.5 °C).

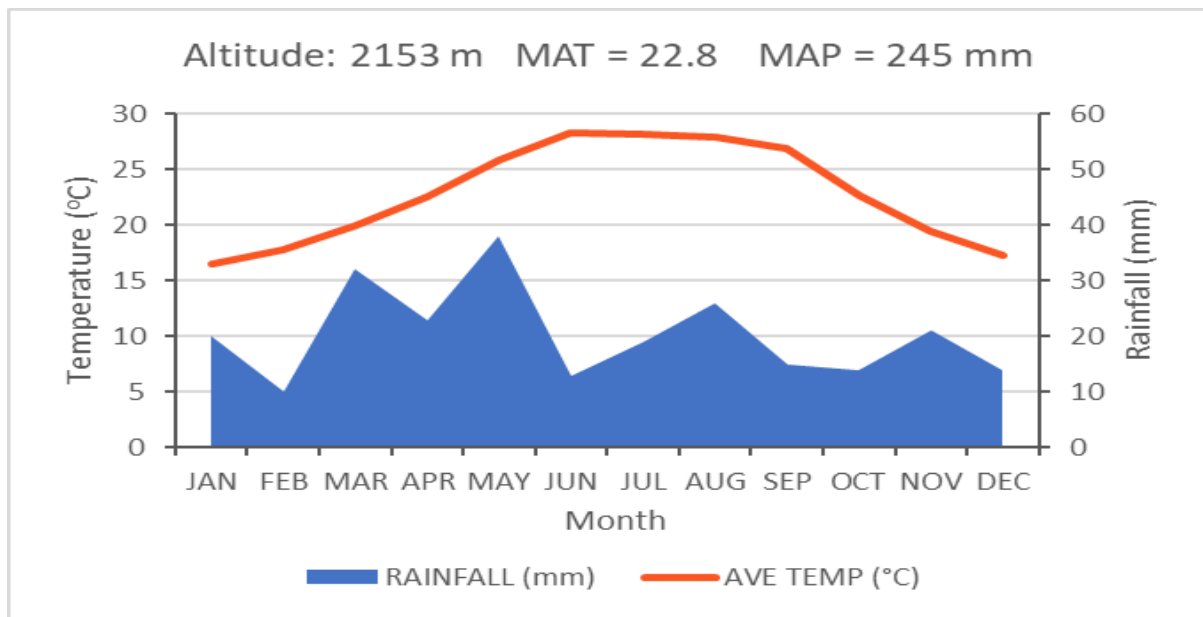


Figure 4: Köppen climate Diagram for Jabal Shada Protected area.

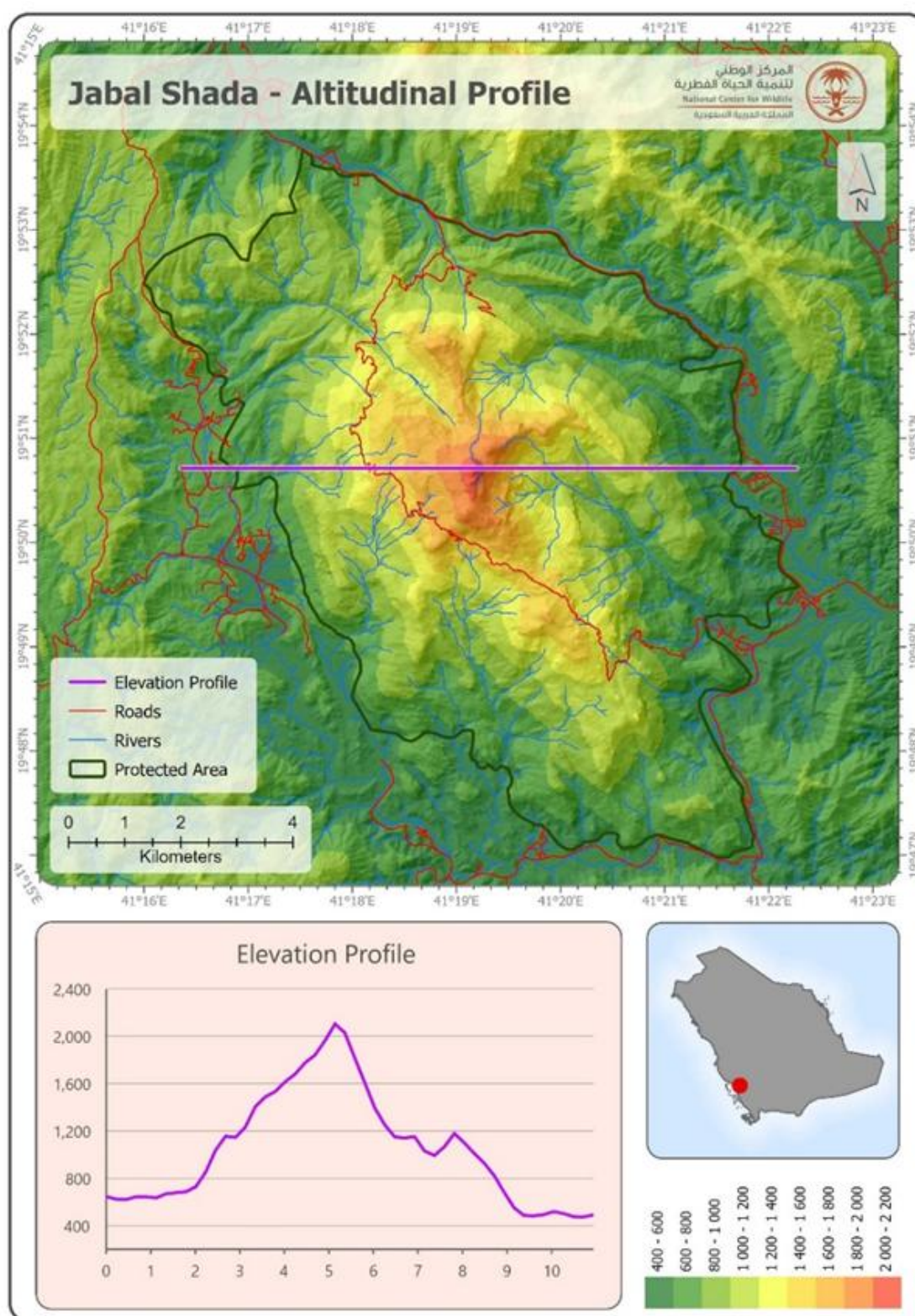
The average annual precipitation for the PA is estimated to be 245 mm. Rainfall occurs throughout the year but peaks in May. Rainfall, like temperature, varies spatially with altitude. The variation in annual rainfall is small, however with a minimum of 197 mm estimated on the lower eastern side of the PA and a maximum of 250 mm per annum at higher elevations on Jabal Shada.

Regarding climate change, it is likely that the PA will experience reduced rainfall and increased extreme weather including droughts. It will become hotter. Climate change implies that water resources within the PA must be protected, any new infrastructure built with potential flash flooding in mind, and tourism developed that considers increasing temperatures.

3.4.2. TOPOGRAPHY GEOLOGY AND SOIL

The topography of the Jabal Shada is determined by its underlying geology, which broadly speaking comprises a late Precambrian syenite pluton surrounded by older schistose greenstone, through which it intrudes. This has given rise to a PA with spectacular scenery of jagged spires and pinnacles which feature as one of the major attractions of the PA.

The PA spans an elevational range of 1699 m, with the lowest point at 450 m above mean sea level at the extreme eastern side of the PA. The highest point is 2149 m above mean sea level at the peak of Jabal Shada. The topography of the PA compromises steeply sloping rocky ground dominated by a cluster of jagged spires and pinnacles that rise high above the surrounding hills and valleys.



Map 11: Topography and elevation profiles of the PA

A breakdown of slope (Appendix Seven) indicated that the vast majority (75 %) of the PA is steep to extremely steeply sloping, with less than one percent flat to gently sloping.



Soils are dominated by bare rock with Lithic Leptosols in the mountainous regions of the PA. These soils are generally very shallow (< 25 cm), with a high proportion of stone and rock and little fine earth material (sandy loam texture), low organic matter, well-drained, and have low fertility (FAO/IIASA/ISRIC/ISS-CAS/JRC, 2023)⁴

3.4.3. HYDROLOGY

The western side of Jabal Shada al-A'la drains into the perennial stream of Wadi Nirah, which feeds into Wadi Nawan, while the eastern side drains into Wadi Suqamah, and the southeastern side drains into Wadi al-Malaqi, both of which are tributary to the perennial stream of Wadi al-Ahsabah. The northwestern end of the PA drains northward into Wadi Yahar / Wadi Suqamah, a tributary of Wadi Dawqah. The steep ravines of Jabal Shada al-A'la carry floods after heavy rain. Springs and seeps are found in ravines on the mountain, and although there are no deep aquifers in the crystalline bedrock, the larger wadi beds contain shallow alluvial aquifers (Llewellyn, 2013). The PA plays a critical role in capturing precipitation and regulating its release into the drainage systems that arise from it.

3.5. BIOLOGICAL ENVIRONMENT ANALYSIS

3.5.1. ECOSYSTEM CHARACTERISATION

At the national level, Jabal Shada falls into two ecoregions the 'Southwest Arabian Montane Woodlands and Grasslands' and the 'Southwest Arabian Escarpment Shrublands and Woodlands' ecoregions. Each is further subdivided into the following ecosystems which are reflective of their elevational, temperature, and rainfall determinants (Map 2):

Southwest Arabian Montane Woodlands and Grasslands

- 'Asir Escarpment Crest Juniper Woodlands – elevation exceeding 1800 m
- 'Asir Escarpment Slope – elevation 1400 to <1800 m

Southwest Arabian Escarpment Shrublands and Woodlands

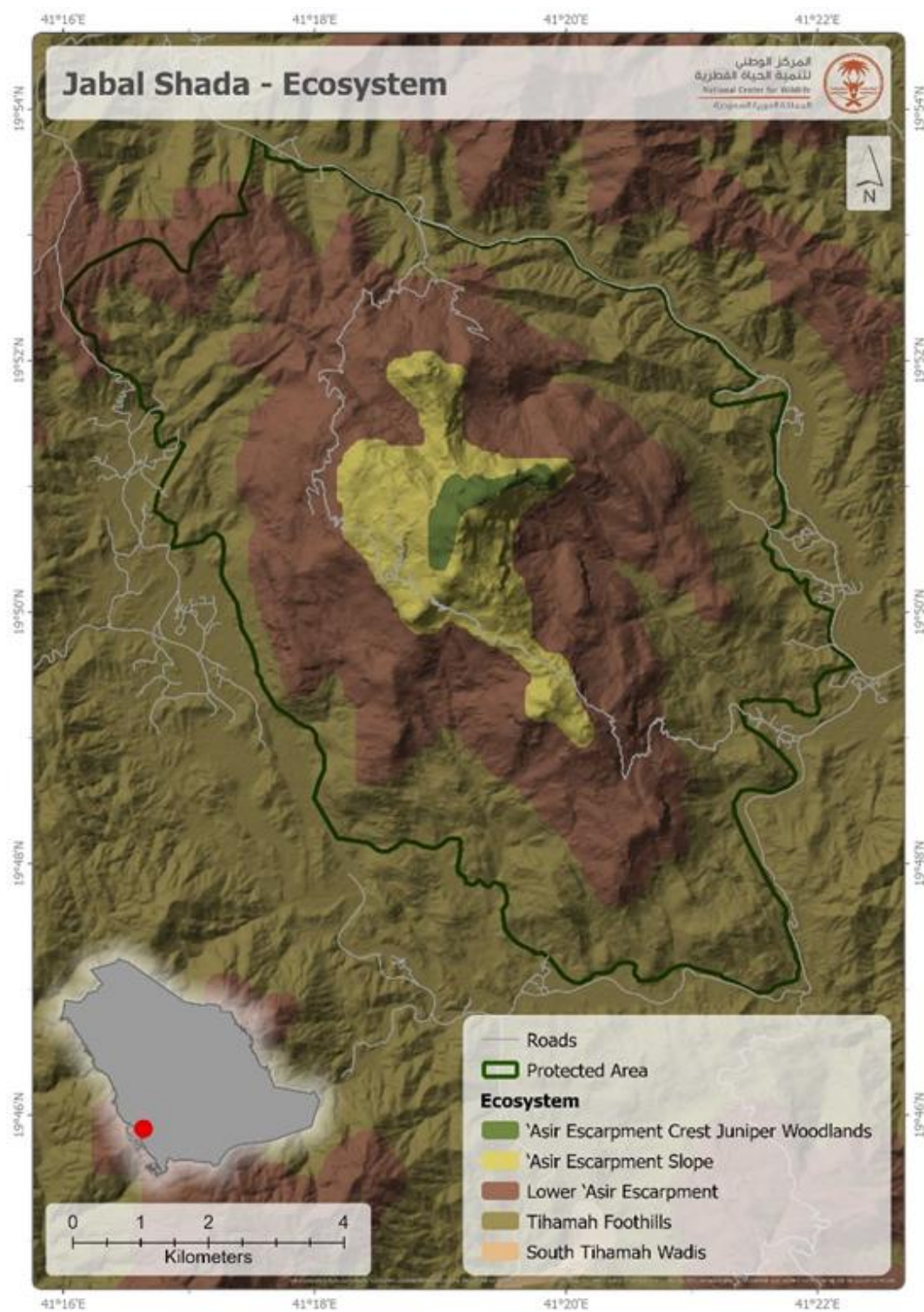
- Lower 'Asir Escarpment – elevation 800 to <1400 m
- Tihamah Foothills – within the PA elevation 400 to <800 m

These ecosystems cover the following area (see also the following map):

Ecosystem	Surface area (km ²)	% for the whole PA
Tihamah Foothills	34.47	43.6
Lower 'Asir Escarpment	35.91	45.4
Asir Escarpment Slope	7.8	9.9
'Asir Escarpment Crest Juniper Woodlands	0.9	1.1

⁴ <https://data.isric.org/geonetwork/srv/eng/catalog.search#/home>

Total	79.08	100
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Map 22: Ecosystems of Jabal Shada



3.5.2. VEGETATION AND PLANTS

Jabal Shada PA is one of seven sites that form an important Bioclimatic Refugia of Western Saudi Arabia. For this characteristic the serial site features on the tentative list of World Heritage Sites (see <https://whc.unesco.org/en/tentativelists/6638/>). An investigation into the endemic and endangered species of the Shada mountains (Thomas, 2017), found 495 plant species falling into 314 genera and 76 families. This included 19 endemic species and 43 endangered species, and as a whole accounting for 22% of the total flora in Saudi Arabia. Their analysis demonstrated the importance of physiographic features, particularly elevation playing an important role in the distribution, frequency, and abundance of species. Endemics were mostly restricted in the elevation zone of 1000–1500 or >1500 m a.s.l. Decreasing substantially above 2000 m a.s.l. Most endangered species were distributed between the elevation of 1000–1800 m a.s.l.; while endangered trees, lianas, and shrubs occupied the elevations 1000–1300 m a.s.l.; and endangered subshrubs and herbs inhabited the elevations 1500–2100 m a.s.l.

Jabal Shada is listed on the tentative list of UNESCO World Heritage Sites as one of a series of seven bioclimatic refugia (<https://whc.unesco.org/en/tentativelists/6638/>). Its inclusion is based on 'exceptionally diverse plant communities of the Somalia-Masai Centre of Endemism and the Eastern Afromontane biodiversity hotspot' as well as 'griffon vultures, endemic birds of the southwestern mountains, and hoary fox, caracal, striped hyaena, Arabian wolf, genet, and previously the Arabian leopard'.

3.5.3. PROBLEM PLANTS

However, as previously identified (Llewellyn, 2013) and obvious to see *Opuntia ficus-indica* is rapidly invading suitable sites at higher elevations around settlements. This invasion must be addressed as a matter of priority.

3.5.4. FAUNA

Jabal Shada Protected Area (PA) is a significant biodiversity hotspot in southwestern Saudi Arabia, harboring a diverse range of species across multiple taxonomic groups. Numerous studies have contributed to the documentation of species within the PA, highlighting its ecological importance. Here we provide an overview of the major faunal groups documented in Jabal Shada, starting with invertebrates up to mammals.

INVERTEBRATES

Formal studies of the fly (Diptera) of Jabal Shada have been published (El-Hawagry, 2016) and the Carabid fauna (Abdel-Dayem, 2019). Concerning the Diptera, a total of 119 species belonging to 87 genera, 31 tribes, 30 families and 42 subfamilies have been recorded from the PA by this study. With respect to the Carabidae, a total of 62 species and subspecies were recorded, representing 39 genera, 17 tribes, and 10 subfamilies, including one new species.

REPTILES

NCW's recent study in Jabal Shada reported 18 species of reptiles. Most of these species are classified as Least Concern by IUCN Red list with 2 species not evaluated and one species (*Ophisops elbaensis*) classified as Data Deficient.

AMPHIBIA

A broader study of the southwestern region of SA (Al-Qahtani, 2018) indicates that three endemic species are likely to be present in the PA namely *Sclerophrys arabica*, *Duttaphrynus dhufarensis*, and *Euphlyclis ehrenbergii*. Recent survey by NCW in Jabal Shada reserve confirmed the presence of *Sclerophrys arabica* and *Euphlyctis ehrenbergii*.



BIRDS

In a recent systematic survey of birds undertaken by NCW about 52 species of birds were recorded, 21% of which were migratory species.. However, 17 species have been listed (Llewellyn, 2013) and seven Arabian endemic birds cited in the tentative WHS listing

MAMMALS

Listed mammals of the PA are nine and comprise mostly meso-predators. The two most abundant mammals are the Hamadras baboon and hyrax. Nubian ibex has been driven locally extinct and is a strong candidate for re-establishment once territorial integrity of the PA, or a portion thereof is achieved. Arabian leopards were present in the PA but have not been recorded for several decades. Recent study conducted by NCW has reported 8 species of mammals from the reserve and those include rodents and bats as well.

RARE AND ENDANGERED SPECIES

The Shada Mountains contain 3.8% endemic species and 13.4% endangered species of plants. Amongst the Carabids 5.3% are endemic taxa, reptiles one endemic taxon, amphibia three endemic taxa, birds seven endemic taxa, and mammals two near threatened taxa.

3.6. TOURISM ASSETS, ACTIVITIES AND USE

- One accommodation facility (Upper Shada Chalets) in the Shada Village.
- Viewpoints and picnic sites are scattered throughout the PA.
- Large day visitor facility at the main entrance to the PA.
- The city of Al Bahah, 1.5 hours by road, has modern amenities, good food options, and budget to 4-star accommodation options.
- Regional attractions include a 400-year-old historical village 24 km south of Al Bahah (Dhee Ayn)
- Attractions include picturesque mountainous terrain, scenic roads, petroglyphs rock art, and caves.
- The traditional way of life of the residents presents significant opportunities for immersive cultural experiences and agrotourism.
- Good wildlife and bird habitats – Strong potential for introduction of Ibex.
- Authorization is required for access.

3.7. SOCIO-CULTURAL AND HERITAGE ASSETS

Socio-cultural and heritage assets include:

- Well-built stone buildings and agricultural terraces.
- The small mosque of Ibrahim.
- Petroglyphs.
- A distinctive variety of coffee is grown on traditional terrace farms at the foot of Jabal Shada.
- Potentially existing *himas* (traditional systems of land conservation and sustainable resource management) designated by Hima al-Kibasah, Hima as-Salatin, and Hima as-Sur.

3.8. STAKEHOLDER ANALYSIS

The stakeholder analysis approach for Jabal Shada PA was based on the existing management plan (NCW 2021) and uses 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 who 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. The matrix below provides the stakeholder analysis results.

Table 6: Summary of key the Jabal Shada PA stakeholders

ENTITY NAME	ROLE	CATEGORY	LEVEL OF INFLUENCE	LEVEL OF INTEREST
Government Entities				
<i>National Center for Wildlife</i>	NCW plays a critical role in safeguarding Saudi Arabia's rich biodiversity, ensuring the sustainable use of natural resources, and promoting harmony between human activities and the conservation of wildlife and their habitats.	Strategic Partner	High	High
Ministry of Environment, Water, and Agriculture	Responsible for environmental policy, regulations, and conservation efforts.	Strategic Partner	High	High
Special Forces for Environmental Security	Responsible for enforcement of environmental and wildlife regulations.	Strategic Partner	High	High
PA Management and Rangers	On-the-ground knowledge of threats and opportunities.	Strategic Partner	High	High
Saudi Environmental Society	Works on environmental awareness, education, and sustainable development.	Interest Group	Low	Low
<i>Saudi Standards, Metrology, and Quality Organization</i>	Sets standards and regulations for environmental conservation and sustainability.	Interest Group	High	Low
<i>National Center for Waste Management (MWAN)</i>	Responsible for waste management within the KSA.	Interest Group	High	Low
<i>Ministry of Tourism (MoT)</i>	Responsible for investment, development, and licensing.	Interest Group	High	Low
<i>Heritage Commission</i>	Responsible for advancing and preserving the heritage sector in the Kingdom.	Interest Group	High	Low
<i>Local Police</i>	Security and law enforcement.	Interest Group	High	Low
<i>Judicial system</i>	Legal and social with limited support to the PA.	Interest Group	High	Low
<i>Municipalities</i>	Local development focuses in and around rural areas with limited support to the PA.	Strategic Partner	High	High
Private Sector				
<i>Saudi Investment Recycling Company (SIRC)</i>	Tasked with developing recycling industries and a circular economy.	Secondary Stakeholder	Low	Low
<i>Renewable Energy Companies</i>	Increasingly important stakeholders focusing on sustainable energy solutions.	Secondary Stakeholder	Low	Low



ENTITY NAME	ROLE	CATEGORY	LEVEL OF INFLUENCE	LEVEL OF INTEREST
Saudi Investment Recycling Company	The company is tasked with developing recycling industries and a circular economy.	Secondary Stakeholder	Low	Low
Local hotels and restaurants	Hotels and restaurants in the adjacent communities.	Enabler	Low	High
Tourism Private Sector	Tourism service companies provide guided and non-guided tourism packages to local and international clients.	Enabler	Low	High
NGOs and Civil Society				
Environmental Advocacy Groups	Organizations focused on biodiversity, conservation, and sustainable development.	Strategic Partner	High	High
Community-Based Organizations	Engaged in grassroots initiatives and local conservation efforts.	Enabler	Low	High
Religious leaders and preachers	Religious and social with limited support to the PA.	Enabler	Low	High
Academic and Research Institutions				
Universities and Research Centers	Conduct studies on environmental issues, provide expertise, and contribute to policy recommendations.	Enabler	High	High
Schools	Social focus with good support for the PA concept.	Enabler	Low	High
International Partners and Organizations				
United Nations (UN) Agencies	Collaborate with Saudi Arabia on various environmental projects and initiatives. These include the Convention on Biodiversity and the UNFCCC.	Strategic Partner	Low	High
UNESCO	World Heritage Status	Strategic Partner	High	High
General Public and Visitors				
Local Communities	Directly affected by environmental policies and initiatives and can play a role in advocacy and implementation.	Enabler	Low	High
Community Leaders and Opinion Leaders	Shape public perception and discourse on environmental issues.	Enabler	Low	High
Livestock owners	Economic and social focus with a high level of hostility towards the PA	Enabler	High	Low
Farm owners	Economic and social focus with a high level of hostility towards the PA.	Enabler	High	Low
Beekeepers	Directly affected by environmental policies and initiatives and can play a role in advocacy and implementation.	Enabler	High	Low

ENTITY NAME	ROLE	CATEGORY	LEVEL OF INFLUENCE	LEVEL OF INTEREST
Visitors – elite groups	Special interests with high support for the PA	Enabler	Low	High
Visitors – regular	General interest in recreation with limited awareness of the PA's importance	Enabler	Low	High

The PA relies on its stakeholders to guide, manage, support, and protect it. Communities, particularly those reliant on the natural resources of the PA play a critical role in the success or failure of a plan.

There is a wide cross-section of stakeholders in Saudi Arabia which can be summarized as follows:

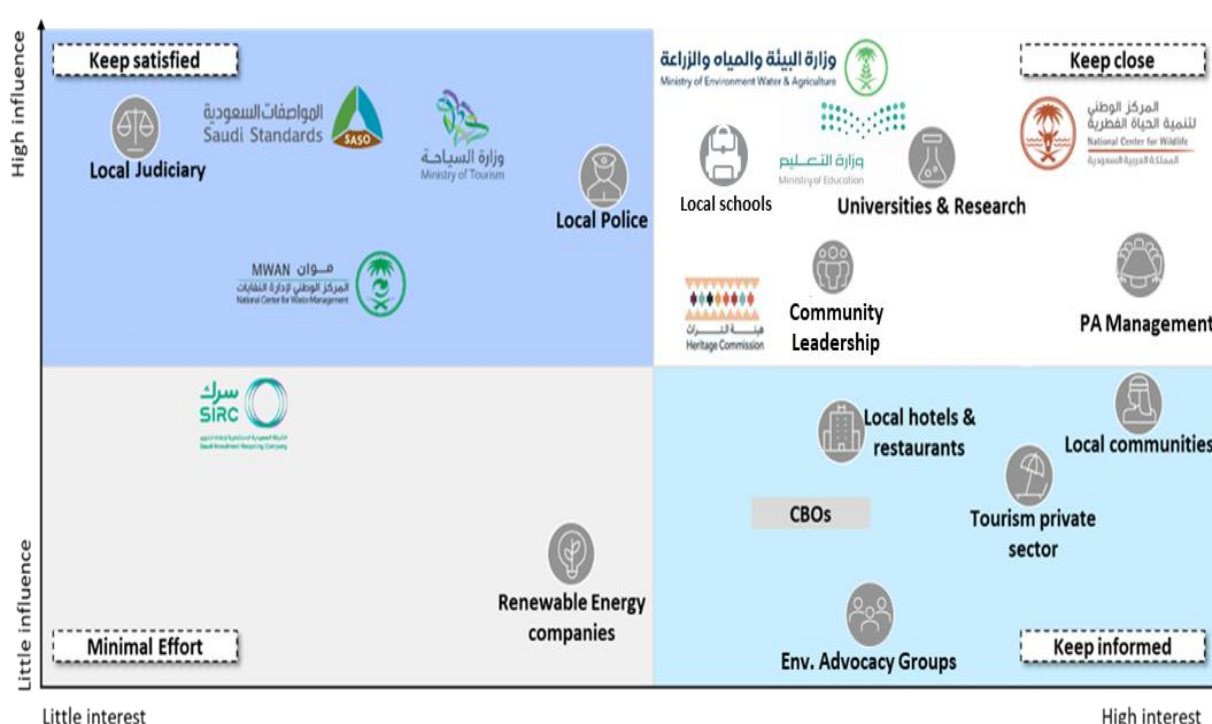


Figure 5: Jabal Shada PA stakeholder profile.

Stakeholder analysis should be a regular exercise, where the effectiveness and the outcomes of the engagements are evaluated, and the results are used to redefine the stakeholders.

3.9. CURRENT THREATS AND PRESSURES

Two methods were used to identify threats and pressures specific to Jabal Shada. The first involved a spatial evaluation of biodiversity hotspots and high-pressure areas, particularly where invasive species, settlement, and grazing overlap with sensitive habitats. Key conflicts were highlighted, and further details are in the Habitat and Wildlife Management Plan. The second method used a 5x5 risk ranking matrix to prioritize threats.

A rapid risk assessment was also conducted, involving interviews with staff, focused discussions with local stakeholders, field visits, and a review of reports and literature. Threats were then ranked based on their likelihood and consequence & severity of impact on the PA's biodiversity and management goals.



Table 7: 5x5 Risk Ranking Matrix

Likelihood		Consequence				
		Negligible	Minor	Moderate	Major	Severe
Almost certain	90% and higher likelihood of occurring	11	16	20	23	25
Likely	Between 30% and less than 90% likelihood of	7	12	17	21	24
Possible	Between 10% and less than 30% likelihood of	4	8	13	18	22
Unlikely	Between 3% and less than 10% likelihood of	2	5	9	14	19
Rare	Less than 3% likelihood of occurring	1	3	6	10	15

Table 8: Tabulated compilation of perceived threats and pressures

THREATS AND PRESSURES	DESCRIPTION	LIKELIHOOD (1-5, NONE TO EXTREME)	CONSEQUENCE (1-5, NEGLIGIBLE TO CRITICAL)	RANKING AS PER 5X5 RISK MATRIX
<i>Invasive Species (Opuntia)</i>	The spread of <i>Opuntia</i> is significantly threatening native vegetation, particularly in agricultural areas. This invasive species competes with indigenous plants, reducing biodiversity and affecting ecosystem stability.	Certain	Major	23
<i>Steep Terrain & Road Risks, including Erosion</i>	The newly completed road is steep. The rugged terrain limits access to much of the protected area, complicating management and monitoring.	Certain	Major	20
<i>Livestock Grazing</i>	Overgrazing by livestock, particularly goats and sheep, is leading to the loss of native vegetation and accelerating soil erosion on the steep slopes, further degrading the landscape and ecosystem. This issue is being exacerbated by resettlement and the expansion of agriculture, which is driving increased livestock pressure. Communities on the periphery are pushing livestock into the protected area, intensifying the strain on its natural resources.	Almost Certain	Moderate	20
<i>Agricultural Expansion - Land Conversion</i>	The expansion of coffee farms and other agricultural activities is converting natural land into farmland, leading to potential habitat loss and the introduction of pesticides, wastewater, and sewerage runoff that can harm native ecosystems.	Almost Certain	Moderate	20
<i>Human-Wildlife Conflict</i>	The overpopulation of baboons is damaging crops and spreading waste in villages, impacting the local community's relationship with wildlife and putting pressure on natural resources.	Likely	Moderate	17
<i>Wood Cutting</i>	Wood cutting of cedar and <i>Acacia tortilis</i> in the lowland area of the periphery	Likely	Moderate	17
<i>Tourism Impact</i>	Unregulated tourism activities, including informal picnicking and camping, contribute to littering and habitat degradation, especially in areas without proper waste management facilities.	Likely	Moderate	17



The various threats and pressures facing the Jabal Shada Protected Area require a proactive, multifaceted approach to ensure effective mitigation, management, and the achievement of conservation objectives. Mitigating these threats, such as invasive species, overgrazing, and unregulated access, necessitates targeted initiatives addressing the ecological and human factors at play. Effective access control measures, improved surveillance, and a comprehensive monitoring system should support these actions to ensure compliance and successful outcomes.

As Jabal Shada continues its conservation efforts, particularly with species reintroductions like the Nubian Ibex, threats such as poaching and illegal hunting are expected to intensify. With improved habitat conditions, grazing pressure may increase as livestock owners take advantage of recovering landscapes, further challenging the ecosystem's balance.

Adaptive management strategies will be critical to address these evolving threats. This includes enhancing community engagement to foster local support for conservation, expanding ranger patrols and enforcement against poaching and illegal activities, and implementing sustainable grazing practices that respect the area's ecological limits. In addition, equitable resource management and ongoing dialogue with local communities will be essential for maintaining long-term harmony and conservation success in Jabal Shada.

3.10. SITUATIONAL ANALYSIS SYNOPSIS AND SWOT

A SWOT analysis was conducted through engagements with PA management and local community stakeholders, backed up by visual evidence gathered by the specialist team during their field visit. The following summarizes some of these key aspects that contributed towards the development of priority management actions forming the bulk of this management plan.

Table 9: Preliminary SWOT analysis for Jabal Shada PA

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
<i>Biodiversity Conservation</i>	<ul style="list-style-type: none"> • Very spectacular, attractive mountainous landscape. • Geologically interesting with potential educational and tourism value. • The rocky landscape 'captures' and funnels rainwater into the sandy soils at their bases, which is then channeled to large wadis in the landscape below. • High altitude ranges lead to high ecosystem diversity. A critical bioclimatic refuge. • Highly plant species richness and endemism. • Range restricted and endemic reptiles and amphibians. • High value for research and environmental education. 	<ul style="list-style-type: none"> • Road network and village settlement almost surround the PA. • Illegal grazing and wood collection. • climate change impacts • littering. • Baboon conflict. 	<ul style="list-style-type: none"> • Re-establishment and potential breeding site for Nubian Ibex. • Develop and implement formal community-managed resource use guidelines based on Hima's philosophy. • Develop a model protected area that demonstrates successful restoration practice with effective community-managed resource use zones. • Research and monitoring - looking at the response to climate change, but also as part of the adaptive management process. 	<ul style="list-style-type: none"> • Poorly aligned unsurfaced access roads – drainage and erosion. • Unsustainable resource use and expanding human footprint. • Invasive Plant Species - <i>Opuntia</i> spp. Covering a significant proportion of the area. • Human-wildlife conflict and the associated socio-ecological impacts. • Increased exposure to diseases associated with feral cats and baboons.
<i>Responsible Visitor Management and Sustainable Tourism Development</i>	<ul style="list-style-type: none"> • Easily accessible from local towns and villages via good quality asphalt roads. The main access road within the PA is asphalt and in very good condition. • Strong government support. Temperate winter months, with December to March being the most conducive for ecotourism. • Mountain PA with spectacular landscapes, granitic rock formations, and numerous caves. 	<ul style="list-style-type: none"> • The PA is very remote in relation to the major metropolitan centres • No financial returns from tourism • No local airport. • Access permits are required • No stand-out 'must see' attractions, but rather a collection of smaller attractions. • Poor marketing (the PA has a very low online presence and is largely unknown as a destination in the 	<ul style="list-style-type: none"> • The 2030 Vision initiative provides opportunities to showcase all of the NCW PAs to a wider audience. • Developing tourism in such a way that there are zones for wilderness, local tourism, international tourism, and hunting. • Develop tourism to allow for budget to mid-market visitors, with a strong bias towards the local market. 	<ul style="list-style-type: none"> • Littering • Global pandemics • Potential uncontrolled expansion of village settlements and farming activities. • No tangible benefits have been delivered to the local community.



	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
	<ul style="list-style-type: none"> • Spectacular and expansive views. • Diversity of flora, fauna, habitats, ecosystems, landscapes, and geological formations. • Likely the most plant-diverse area in Saudi Arabia. • Fauna includes baboons, foxes, wolves, and rock hyrax. • Ibex are locally extinct, but the PA appears suitable for reintroduction. • Potential for interpretive tours to farms for coffee and honey production experience. • Cultural historical sites, e.g. rock with historical value (the legend that prophet Abraham would have sat there). • Regional attractions include a 400-year-old historical village 24 km south of Al Bahah (Dhee Ayn) • The resident community within the PA offers great potential for private sector initiatives and potential upscale tourism arrivals. • Vast scope to provide appropriate, judiciously planned nature, adventure, and culturally based activities, including short walks, hiking trails, trails, mountain biking trails, homestay and immersive cultural experiences, etc. • Excellent opportunities for the development of agrotourism 	<ul style="list-style-type: none"> • regional and international travel market. • No dedicated tourism personnel. • High prevalence of anthropogenic activity and facilities within the PA (villages and farming). Approximately 2000 people are resident within the PA. • litter especially in well-traversed areas of the PA. 	<ul style="list-style-type: none"> • The terrain allows for secluded sites and a range of wilderness and adventure activities. • Potential to develop complimentary activities and facilities in adjacent proposed community-managed resource areas. • Generate income through entrance fees, accommodation, activities, and spin-off opportunities. • Strengthen marketing and positioning. • Value chain opportunities. • National policies that favor tourism development • Opportunity to provide appropriate, judiciously planned nature, adventure, and culturally-based activities, as well as agrotourism. • Opportunity to use tourism development as a catalyst for bringing the local communities together in support of a greater cause and common goals. 	



	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
	<ul style="list-style-type: none"> The local community living within the PA is very supportive of the PA and showed a keen interest during the field trip to play a meaningful role in the development of tourism. Cool winter months, and temperate summer months. Very popular destination in the height of summer (June and July), when regional tourists visit the area to escape the summer heat. 			
<i>Stakeholder Relationships</i>	<ul style="list-style-type: none"> The resident community is positive about the PA. The resident community actively trying to resolve issues like litter control and <i>Opuntia</i> infestation. Proud of the cultural heritage and archaeological value of PA and want it conserved and properly interpreted for visitors. The community would like to see greater socio-economic benefits from the protected area. Enthusiastic about research in the PA – wants research center built. PA management appears to have a good relationship with community leadership. 	<ul style="list-style-type: none"> Relationships with the community and community leadership are still informal. Little knowledge of sustainable resource use concepts and practices. Little capacity for tourism management within the community. No linkages to other wildlife or heritage attractions/sites in the area or elsewhere. 	<ul style="list-style-type: none"> Cultivate positive relationships with local communities by demonstrating good natural resource management practices. Educate local community livestock managers on the theory and practice of sustainable grazing practice. Reskill community members to be able to participate in the conservation, tourism, and hospitality industry. Revive the HIMA system with communities in and around the PA 	<ul style="list-style-type: none"> Uncontrolled unsustainable use of resources – grazing and wood. Expansion of settlement and associated transformation within the PA.
<i>Park Management</i>	<ul style="list-style-type: none"> Park management is aware of the biodiversity importance of the PA. PA management is enthusiastic and keen to see the PA progress. 		<ul style="list-style-type: none"> Strong reinforcement of the biodiversity importance of the PA throughout the rank and file of NCW. 	<ul style="list-style-type: none"> Environmental Risks: Invasive species, soil erosion, and climate change pose significant threats to park management and infrastructure.



	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
	<ul style="list-style-type: none"> The internal resident community is largely positive and sees opportunities in PA. Resource use under control. The size of the area makes it relatively easy to manage. 		<ul style="list-style-type: none"> Apply adaptive management philosophy informed by appropriate surveillance and monitoring. 	<ul style="list-style-type: none"> Poor road alignment leads to water canalization and erosion. Illegal resource use. Expanding human footprint.



SECTION FOUR: VISION AND TARGET OUTCOMES

4.1. STAKEHOLDER CONSULTATION OUTCOMES

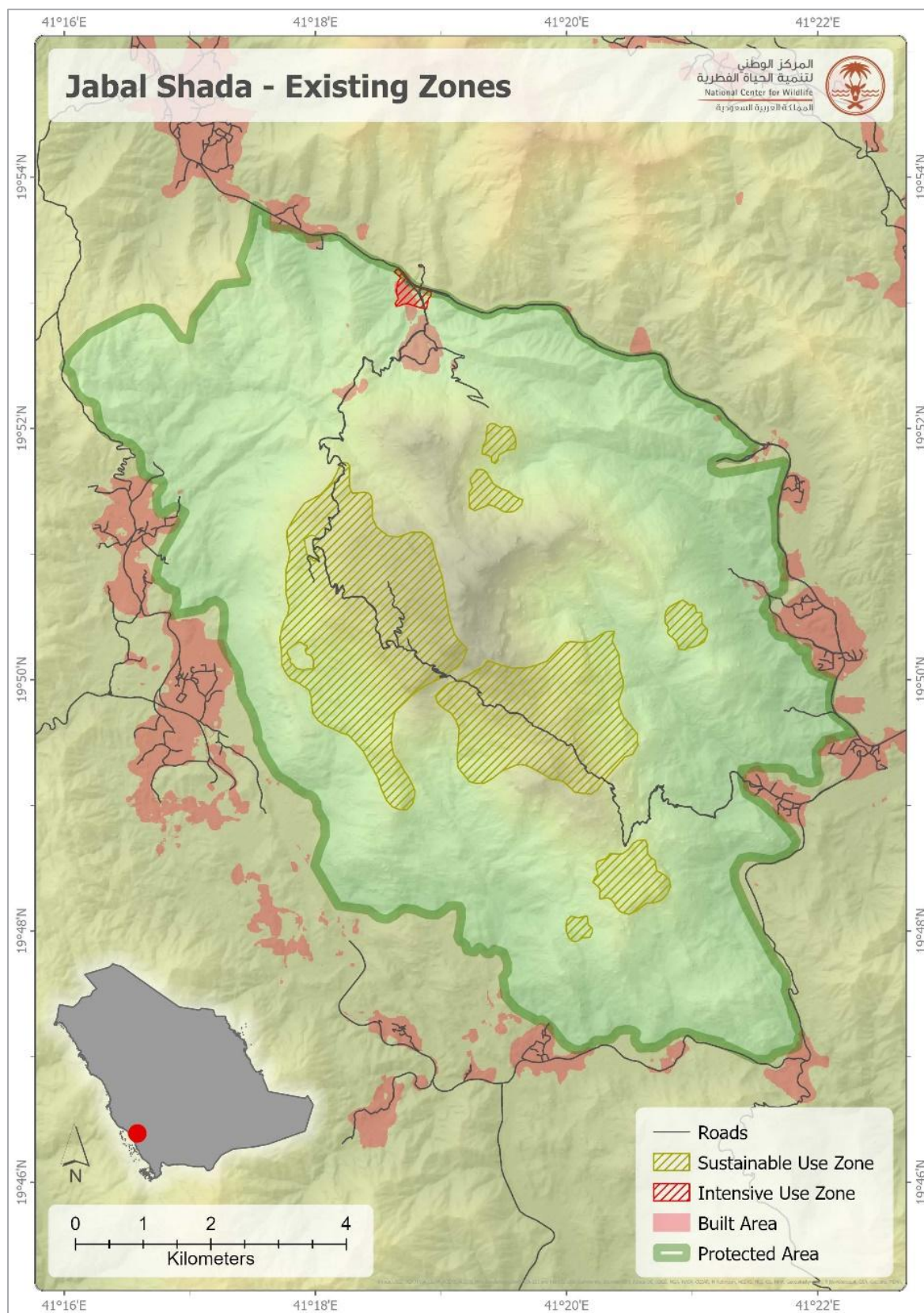
The following table provides insight into the stakeholder engagements undertaken during the fieldwork.

Table 10: Community and PA Management Consultation Outcomes

SECTOR	ISSUES/SUBJECT OF DISCUSSIONS
<i>PA Management</i>	<ul style="list-style-type: none"> The PA was established by agreement between communities and SWA – the main objective is to restore and manage vegetation. The boundary is demarcated and signposted. Human footprint (buildings and agricultural fields) is restricted to the Sustainable Use Zone. The special values of the PA are recognized to be plant diversity and reptile diversity. The main problems encountered by management are with baboons (raiding human habitation and litter), sheep, cattle, and camels (on the border) straying into the PA and grazing/browsing, and illegal wood collection of mainly Sidr and <i>A. tortilis</i>. Baboons exacerbate the litter problem as bins are not baboon-proof. Fire is not considered a threat – only one lightning fire in the last 20 years. <i>Opuntia</i> is a great problem on the main mountain and it is understood by management that the local population would welcome its removal. There are important natural springs in the PA, but people in and around the PA get their water from wells and supplied water tankers.
<i>Tourism and community</i>	<ul style="list-style-type: none"> Visitation is seasonal – holidays, especially if school holidays are longer than one week. Mainly camping and picnicking in villages and defined areas where there are toilets. Camping can take place anywhere in the PA, but by permit only. Formal trails with guides. Hiking is open access. <p>Community discussion</p> <ul style="list-style-type: none"> Plan to develop a liaison/management committee representing the 12 villages and NCW management – still in process. This would include police, municipality, and education authorities. There is no formal structure coordinating tourism activities between NCW and private enterprises.
<i>Community leadership and senior representatives</i>	<ul style="list-style-type: none"> Wants the PA to be actively developed as a conservation asset. Would like to encourage local research and researchers. Coffee bean growing has expanded on private land within the PA and there is no conflict with PA as boundaries are well defined. Pride in the coffee growers as they produce very good quality coffee and the activity is strongly supported by the government. Would like to see a visitor center and research center built to support tourism and research activities in the PA. <p>Issues and attitudes</p> <ul style="list-style-type: none"> <i>Opuntia</i> seen as a problem – believes researchers Al Bahah are working on resolving.



SECTOR	ISSUES/SUBJECT OF DISCUSSIONS
	<ul style="list-style-type: none"> Baboons are a big problem – believes the solution is to remove them altogether. However, researchers from Al Bahah are working on resolving this. Encourages the reestablishment of ibex as habitat is better than elsewhere. Leopards were seen 35 years ago – not sure about their reestablishment. Birds of prey were reduced probably by poisoning leopards and other small predators. Wood cutting is a problem on the periphery of the PA.



Map 33: The existing zones of Jabal Shada



4.2. MAJOR SITE VALUES

Category	Type of Value	Description
Ecological Value	Biodiversity stronghold of the Kingdom and the region.	<p>This isolated mountain massif supports an exceptionally rich flora with approximately 500 plant species recorded, including 63 key plant taxa that are endemic and Afrotropical relicts. For instance, the Jabal Shada hosts several endemic species including <i>graveolens</i> ssp. <i>arabica</i> and <i>Euphorbia</i> sp. aff. <i>parciramulosa</i> (Llewellyn 2013). Other Arabian endemic plant species include <i>Acacia johnwoodii</i>, <i>Aloe armatissima</i>, <i>Aloe rubroviolacea</i>, <i>Aloe sabaea</i>, and <i>Aloe shadensis</i>. Other key plant taxa include <i>Nuxia oppositifolia</i> (EN), <i>Breonadia salicina</i>, <i>Mimusops laurifolia</i>, <i>Crinum album</i>, <i>Scadoxus multiflorus</i>, <i>Caralluma shadhbana</i>, <i>Caralluma quadrangularis</i>, <i>Caralluma commutata</i> subsp. <i>sheilae</i> = <i>Orbea sprengeri</i> subsp. <i>commutata</i>, <i>Caralluma eremastrum</i> = <i>Orbea wissmannii</i>, <i>Ceropegia vignaldiana</i>, <i>Gymnema sylvestre</i>, <i>Sarcostemma arabica</i>, <i>Cyperus alternifolius</i> subsp. <i>flabelliformis</i>, <i>Dracaena ombet</i>, <i>Barbeya oleoides</i>, <i>Teclea nobilis</i>, <i>Maytenus parvifolia</i>, <i>Flueggea virosa</i>, <i>Sporobolus pellucidus</i>, <i>Eulophia guineensis</i>, <i>Eulophia petersii</i>, <i>Holothrix arachnoidea</i>, <i>Gladiolus dalenii</i>, <i>Portulaca kermesina</i>, <i>Portulaca grandiflora</i>, <i>Abrus precatorius</i>, <i>Plectranthus asirensis</i>, <i>Dodonaea angustifolia</i>, <i>Erica arborea</i>, <i>Ziziphus mucronata</i>, <i>Ficus ingens</i>, <i>Ficus vasta</i>, <i>Sageretia thea</i>, <i>Jasminum grandiflorum</i>, <i>Clematis hirsuta</i>, <i>Periploca somalensis</i>, <i>Rhus retinorrhoea</i>, <i>Rhus abyssinica</i> and <i>Olea europaea</i> (https://whc.unesco.org/en/tentativelists/6638/).</p> <p>On the other hand, the PA is also rich in endemic avian species. Out of 17 listed species, 7 species rare Arabian endemic birds, suggesting that 41% of the available species represent endemic birds. Some of the available species include griffon vultures and endemic birds of the southwestern mountains. Similarly, the PA hosts several mammal species including mesopredators including fox, caracal, striped hyaena, wolf, and genet. The area forms part of the larger range of the Arabian leopard which has been nearly extirpated but that could make a comeback in this habitat. This outstanding biodiversity may extend to amphibians and reptiles which have not been systematically surveyed yet. However, a broader study of the southwestern region of the Kingdom (Al-Qahtani, 2018) indicates that three endemic species are likely to be present in the PA namely <i>Sclerophrys arabica</i>, <i>Duttaphrynus dhufarensis</i>, and <i>Euphlyclis ehrenberg</i>.</p>
	Potential rewilding for	Nubian ibex historically occurred and could be re-introduced. Jabal Shada forms part of the larger natural range of the Arabian leopard. It could in the future provide a stepping-stone for re-introduced leopards in the larger surrounding landscape.
	Ecosystem services and products	Jabal Shada forms an important water catchment feeding into streams and rivers on its periphery. The western side



		of Jabal Shada al-A'la drains into the perennial stream of Wadi Nirah, which feeds into Wadi Nawar, while the eastern side drains into Wadi Suqamah, and the southeastern side drains into Wadi al-Malaqi, both of which are tributary to the perennial stream of Wadi al-Ahsabah. The northwestern end of the reserve drains northward into Wadi Yahar / Wadi Suqamah, a tributary of Wadi Dawqah. Apart from water provisioning, the PA provides food (incl. honey), fiber, medicinal plants, livestock fodder, building, and raw materials incl. timber, firewood, habitat, and genetic resources. Besides, the PA plays a critical role in regulating climate and water, sequestering carbon, and purifying air and water quality. In terms of cultural services, the PA offers several education, recreation, and research opportunities due to its cultural heritage, and aesthetic, spiritual, and religious values.
	Bioclimatic refuge	Jabal Shada forms one of the elements of a serial World Heritage Site that comprises the most outstanding bioclimatic refuges in Western Arabia. https://whc.unesco.org/en/tentativelists/6638/ .
Economic Value	Economic opportunities	The PA presents several opportunities for socioeconomic development to the local communities through tourism activities and continued agricultural production with a focus on niche crops such as coffee.
	Source of employment	Organized day-visitor activities including farm visits as well as overnighting (including farm stays) could generate employment opportunities for the local community. Agritourism and ecotourism could help counter the migration of local youth to the cities.
Socio-cultural Value	Cultural Value	The area has a rich cultural heritage and history. The historical heritage and living culture include the small mosque of Ibrahim and small-scale rural subsistence farming and coffee growing. Petroglyphs and caves are found. Rock art contains spectacular examples of previously occurring wildlife such as the Nubian ibex.
	Aesthetic and Recreational Value	The spectacular mountain scenery comprises jagged spires and pinnacles. The existing tar road provides access opportunities for visitors to experience the beauty of these mountains and to enjoy recreational activities such as picnicking, visiting local farms, hiking, etc. Rock climbing is becoming an increasingly popular niche activity in the Kingdom.
	Nutritional Value	The environment of Jabal Shada with its traditional terraces allows for the production of food and other crops that provide nutrition directly and indirectly (through income generation) to the local communities living within the PA. Besides, the PA plays a vital role in beekeeping that contributes significantly to the local economy.
	Scientific Value	The combination of montane ecosystems and local agricultural systems, in particular the cultivation of coffee, offers unique opportunities to research issues of sustainability and adaptation that become even more relevant in the face of global climate change.



	Educational Value	The current agricultural practices, in particular the water harvesting techniques used and the coffee production offer educational opportunities to visiting members of the public and school children.
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4.3. PROTECTED AREA VISION, MISSION AND GOALS

4.3.1. VISION

“A restored, protected and sustainably used and resilient example of the ecological processes, habitats, and species typical of the Southwest Arabian Montane Woodlands and Grasslands Ecoregion, which supports sustainable benefits to local communities and citizens of Saudi Arabia as a whole”

4.3.2. MISSION

Restore, protect, and sustainably manage the protected area with and for the benefit of the neighboring human population first, and for the benefit of the citizens of Saudi Arabia as a whole.

4.3.3. GOALS

The following overarching goals focus attention on the requirements for meeting the vision and mission of the protected area:

1. **Biodiversity conservation** – restore, protect, and maintain biodiversity (ecosystems, species, and genetic), ecological integrity, and resilience, ensuring the survival of rare threatened, and endemic species.
2. **Sustainable resource management** – implement practices that allow for the sustainable harvesting of resources in support of long-term ecosystem health, integrity, and local livelihoods.
3. **Cultural and traditional practices** – Recognize and support the rights and traditional practices of local communities and incorporate these into conservation strategies.
4. **Research and monitoring** –
 - a. Undertake scientific inventories and investigations to improve knowledge of the structure, function, and ecological dynamics of the biophysical elements of the PA.
 - b. Monitor ecological change in response to management interventions and resource use to inform adaptive management.
 - c. Monitor the response and attitudes of local communities to management interventions (outreach, education access, and use of resources) to inform adaptive management.
5. **Education and Awareness** –
 - a. Promote education and awareness among local communities.
 - b. Involve the local community in conservation and sustainable resource use programmes through capacity building and outreach.
6. **Sustainable Development** –
 - a. Support sustainable development initiatives that benefit local communities and contribute to conservation goals.
 - b. Promote and facilitate nature-based tourism and other sustainable economic activities that do not harm nature or the environment.
7. **Conflict Resolution** – Develop and implement mechanisms to resolve conflicts over resource use and access.
8. **Legal and Institutional** –
 - a. Ensure effective governance, including clear land tenure and resource use rights.
 - b. Establish and enforce a strong legal and institutional framework for the management of the protected area.



4.4. STRATEGIC OBJECTIVES AND OPERATIONAL KPIS

Strategic objectives and their target outcomes to focus on until 2030 are summarized (see the table below).

Table 11: Strategic objectives and target outcomes for Jabal Shada PA.

NO	KEY AREA	SPECIFIC OBJECTIVES	TARGETED END STATES (2030)
1	Biodiversity Conservation	<ol style="list-style-type: none"> 1. Re-align or close existing roads and tracks which are environmentally detrimental. 2. Dissipate water captured by roads and tracks in an environmentally sensitive manner and according to accepted road drainage guidelines. 3. Reduce illegal boundary incursions and resource use to an acceptable minimum. 4. Demarcate, secure, and fence a fauna re-establishment zone with appropriate fencing and security technology where required. 5. Establish a minimum (20) founder populations of Nubian ibex in the fauna re-establishment zone. 6. Limit grazing and browsing intensity to a level that promotes ecosystem restoration and recovery – the 'acceptable' level. 7. Develop and implement a plan to eradicate <i>Opuntia spp</i> from the PA. 	<ol style="list-style-type: none"> 1.1. Existing environmentally unacceptable roads have been closed or re-aligned. 2.1 All roads and tracks have appropriate water drainage constructed according to accepted road drainage guidelines. 3.1. Illegal boundary incursions and resource use reduced to an acceptable predetermined minimum. 4.1. Fauna re-establishment zone demarcated fenced and secured. 5.1. Minimum founder populations of Ibex re-established in the fauna re-establishment zone. 6.1. The 'acceptable' level of grazing and browsing has been determined. 6.2. Levels of grazing and browsing are constrained to the 'acceptable' level. 7.1. <i>Opuntia spp</i> have been eradicated from the PA.
2	Sustainable resource Use management	<ol style="list-style-type: none"> 1. Develop agreed guidelines for the sustainable use of resources in the Sustainable Resource Use Zone. 2. Promote the adoption of sustainable resource use guidelines amongst resident resource users. 3. Promote and facilitate the adoption of sustainable grazing practices in the Sustainable Use Zones within the PA. 4. Ensure that any new land transformation⁵ activities in the PA are preceded by a full EIA ⁶ where all alternatives are objectively considered. 	<ol style="list-style-type: none"> 1.1. Sustainable resource use guidelines have been developed and agreed to by the communities living within the PA. 2.1. Resource use guidelines have been adopted by resident resource users and adhered to by the majority. 3.1. Sustainable grazing is being practiced in community-managed resource-use areas. 4.1. All new land transformation activities have been preceded by an EIA through which the transformation activity has been evaluated and deemed acceptable.
3	Cultural and Traditional Practices	<ol style="list-style-type: none"> 1. Document and preserve traditional knowledge. 2. Collaborate with local communities to incorporate traditional knowledge and practices into formal management plans and strategies where still appropriate. 3. Protect sacred sites and cultural heritage. 	<ol style="list-style-type: none"> 1.1. Traditional environmental knowledge and practices have been documented and disseminated. 2.1. Traditional and environmental knowledge and practices have been incorporated into management plans and strategies where appropriate. 3.1. Sacred sites and cultural heritage in the PA are protected.

⁵ Land transformation activities refer to any disruption which alters the hydrological, soil or vegetated area of the PA.

⁶ Refer to: UNESCO/ICCROM/ICOMOS/IUCN. 2022. *Guidance and Toolkit for Impact Assessments in a World Heritage Context*. Paris, UNESCO. ISBN 978-92-3-100535-0.



NO	KEY AREA	SPECIFIC OBJECTIVES	TARGETED END STATES (2030)
4	Research and monitoring	<ol style="list-style-type: none"> 1. Develop and maintain 'complete' annotated species lists of reptiles, amphibians, birds, and mammals through observation and survey. 2. Develop and implement a periodic status and distribution surveillance plan for endemic and threatened plants in the PA. 3. Develop and implement a post-re-establishment monitoring surveillance plan for the re-established ibex population. 4. Develop and implement monitoring systems to track the status and trends of natural resource use within the protected area and its sustainable use zone. 5. Establish patterns and associated causes of plant community change. 	<ol style="list-style-type: none"> 1.1. Species lists of amphibians, reptiles, birds, and mammals annotated with their IUCN Red-list Status have been completed and are maintained. 2.1. Status and distribution surveillance plan for endemic and threatened plants is being implemented. 3.1. Post-establishment plans for ibex developed and implemented to inform ongoing management interventions. 4.1. Required monitoring documents for resource use developed and implemented. 5.1. A program to understand the pattern and causes of plant community change has been implemented.
5	Education and Awareness	<ol style="list-style-type: none"> 1. Train local communities in sustainable resource use concepts and methods to ensure that resource use does not exceed regeneration rates. 2. Promote vegetation recovery and soil conservation practices to restore ecosystem services and productivity in the buffer zone around the protected area. 	<ol style="list-style-type: none"> 1.1. Local community resource users understand the concept and benefits of sustainable resource use and are actively engaged in implementing these in their harvesting regime. 1.2. Quarterly meetings are held with resource use committees where ecosystem recovery is promoted.
6a	Sustainable development	<ol style="list-style-type: none"> 1. Support and facilitate the participation of local communities in the 'biodiversity economy' associated with the protected area. 2. Support the development of alternative livelihoods that reduce pressure on natural resources, such as beekeeping, handicrafts, and ecotourism. 3. Facilitate and develop nature-based tourism opportunities that provide socio-economic benefits to local communities while minimizing environmental impacts. 4. Reduce financial barriers to starting and maintaining biodiversity-based businesses. 	<ol style="list-style-type: none"> 1.1. Local communities have been equipped with the skills and knowledge needed to engage in the biodiversity economy. 1.2. Opportunities for local community members to benefit from the biodiversity economy associated with the protected area are fully supported. 2.1. Alternative livelihood ventures have been promoted and supported. 3.1. Direct benefits from nature-based tourism to the PA and its buffer have been received by local communities. 4.1. Offer microfinance, grants, or low-interest loans to support community-based biodiversity enterprises.
6b	Visitor management and tourism development	<ol style="list-style-type: none"> 1. Ensure all tourism development proposals are responsive to the applicable IUCN Green List Indicators. 2. Take cognizance of and be responsive to, the needs and aspirations of all stakeholders, including the local community. 3. Identify and describe appropriate target markets. 	<ol style="list-style-type: none"> 1.1. A high-level tourism development framework that will guide the tourism development and management within the PA for the next 5 years. 2.1. The proposed visitor center at the main entrance is appropriately equipped and operational. Entrance infrastructure is developed for the northern and southern access points. 3.1. Viewpoints, hides, trails, and signage developed (within the Reserve).



NO	KEY AREA	SPECIFIC OBJECTIVES	TARGETED END STATES (2030)
		<ol style="list-style-type: none"> Identify and describe a range of appropriate tourism experiential areas that showcase the biodiversity, landscapes, and cultural historic assets of the PA. Identify and describe appropriate visitor activity typologies compatible with the PA's character and its conservation values and environmental sensitivities. Identify and describe appropriate tourism amenity typologies compatible with the PA's character and its conservation values and environmental sensitivities. Identify and describe appropriate tourism products and tourism operational models. Identify and describe appropriate visitor and tourism management guidelines, including carrying capacity and effective access control. 	<ol style="list-style-type: none"> 2x Day visitor sites developed, 40 visitors each (Shada village and south gate), 3x Pitch and strike campsites developed. Self-catering mountain eco-lodge developed. Local guides recruited, trained, and equipped. Environmental education, training, and participatory programmes developed A user-friendly system is in place for the booking of access and guides by local communities and other visitors for camping and other permissible leisure activities. Environmental monitoring of visitor impact on biodiversity and habitats Environmental monitoring and auditing of all visitor activities and facilities Visitor satisfaction & feedback monitoring system in place LACs established and adjusted based on visitor satisfaction and environmental monitoring
7	Conflict resolution	<ol style="list-style-type: none"> Ensure incisive and participatory decision-making processes that involve all relevant stakeholders including local communities. Develop effective mechanisms to resolve disputes and conflicts related to resource use, land rights, and management practices within the protected area and its buffer zone. Prevent or reduce the incidence of human-wildlife conflict which leads to negative perceptions of the protected area. 	<ol style="list-style-type: none"> Relevant stakeholder management committees were established to facilitate dialogue and shared decision-making. Conflict resolution committees, mediation processes, and legal frameworks are in place and can adequately address grievances and disputes. Preventative measures, deterrents, and compensation systems are in place to protect or compensate communities for losses where appropriate.
8	Legal and institutional	<ol style="list-style-type: none"> Strengthen institutional capacity. Enhance Enforcement mechanisms. Promote participatory governance. 	<ol style="list-style-type: none"> The protected area has adequate resources, staff, and technical expertise to achieve the PA objectives. Collaboration between enforcement agencies and local communities has been achieved. The rights and interests of local communities are recognized and respected. Local communities and other stakeholders are involved in the decision-making of the protected area.



SECTION FIVE: STRATEGY AND ROADMAP

5.1. THREAT MITIGATION AND RESTORATION INITIATIVES

Addressing and mitigating unlawful and incompatible activities that threaten the ecological integrity of the Jabal Shada Protected Area is critical for its long-term conservation and sustainability. Strategies should be based on global best practices in ecosystem restoration, focusing on biodiversity preservation, species reintroduction like the Nubian Ibex, and sustainable tourism development.

A crucial component of success is the active involvement of the local community and inhabitants. As key stakeholders, they will play a central role in managing and monitoring both their own and external impacts, implementing threat mitigation, and driving restoration efforts. Their full buy-in and support are essential at every level, from planning to execution. Building this support requires continuous dialogue, education, and inclusion in decision-making, ensuring that local needs align with conservation goals.

Community and resource user engagement programs should focus on raising awareness of the protected area's ecological value, fostering voluntary compliance, and promoting sustainable practices. This approach will lead to stronger enforcement and a cooperative effort to maintain the area's integrity.

Collaboration with law enforcement, including the National Center for Wildlife (NCW), local police, and judiciary, remains critical. Ultimately, the long-term success of Jabal Shada's conservation efforts hinges on robust community participation, political will, adequate financial and human resources, technical expertise, and leadership.

Table 12: Threats and pressures

THREAT/PRESSURE	MITIGATION AND RESTORATION INITIATIVES
<i>Invasive Species (Opuntia)</i>	<ul style="list-style-type: none"> Regular mechanical removal and safe disposal of Opuntia, prioritizing areas where native vegetation is at high risk. Create employment and benefits through invasive clearing contracts. Organize community-led removal efforts. Educate local farmers and communities through workshops and demonstrations on invasive species identification, early removal techniques, and prevention strategies.
<i>Erosion, Steep Terrain & Roads Risks</i>	<ul style="list-style-type: none"> Addressing man-induced erosion issues, e.g. roads and fallow lands. Resident community ownership and responsibility for the management of erosion-related issues. Implement access restrictions on dangerous roads, particularly during peak rainfall or poor visibility, to minimize accidents. New tracks and roads need to be properly planned, engineered, and developed, taking cognizance of their environmental impact. Encourage visitor access and broader use of PA on foot rather than opening new roads and requiring vehicle use. Develop safer, alternative routes for visitors with gradual inclines and guardrails, ensuring sustainable and low-impact roads. Install erosion control measures, adequate drainage, and barriers such as gabions along existing roads to prevent further degradation.
<i>Livestock Grazing</i>	<ul style="list-style-type: none"> Compliance with zonation. Develop a mechanism to confine livestock to a Sustainable Use Zone. Engage communities in sustainable livestock management practices, such as controlled herd sizes, to reduce reliance on grazing in PA. Implement sustainable grazing systems to allow vegetation recovery between grazing periods and reduce soil erosion on steep slopes. Educate farmers on the benefits of rotational grazing for long-term productivity. Conduct carrying capacity assessments.



THREAT/PRESSURE	MITIGATION AND RESTORATION INITIATIVES
<i>Human-Wildlife Conflict (Baboons)</i>	<ul style="list-style-type: none"> Secure food sources and waste in baboon-proof containers, particularly near farms and picnic sites, to reduce their attraction to human areas. Problem Animals are dealt with humanely through lethal control and management. Educate communities through outreach programs on coexisting with baboons and other wildlife, emphasizing the importance of proper waste disposal and minimizing human-wildlife interactions. Where peripheral fences are being established, fenced standards and specifications must contain baboons within the PA.
<i>Agricultural Expansion</i>	<ul style="list-style-type: none"> Promote sustainable coffee farming practices that reduce the need for expansion and habitat conversion. Intensify rather than expand. Limit farm expansion through zoning and land-use planning in collaboration with local authorities, preventing encroachment into sensitive areas. Offer incentives for sustainable practices.
<i>Tourism Impact (Litter & Habitat Degradation)</i>	<ul style="list-style-type: none"> Install waste management systems at visitor areas, including bins and recycling facilities, and coordinate regular waste collection with local authorities. Promote exploring and use of the PA on foot. Establish marked trails and picnic zones to limit visitor movement to designated areas, reducing damage to sensitive habitats. Use signage to guide responsible behavior. Implement visitor education programs on responsible tourism, including pre-arrival materials and interpretive tours, highlighting the importance of preserving the PA's natural and cultural heritage.
<i>Access Control and Area Integrity</i>	<ul style="list-style-type: none"> Station rangers at key access points to enforce entry permits, monitor unauthorized activities, and educate visitors about the regulations of the protected area. Enforce permits for entry and use of the protected area and connect permit issuance with visitor orientation sessions that explain the rules and conservation efforts.
<i>Wood Cutting of Cedar & Acacia Tortilis</i>	<ul style="list-style-type: none"> Strengthen enforcement against illegal wood cutting by increasing ranger patrols in high-risk areas and collaborating with local leaders to promote conservation-friendly alternatives.

5.2. ZONING AND PHASING STRATEGY

5.2.1. ZONATION

The zoning plan for the PA was developed to include a set of zonation categories that are firstly responsive to the IUCN categories, and secondly responsive to the natural, man-made, and cultural historic environment of the Jabal Shada protected area.

The key information to the zoning plan includes the following:

- Topography and gradient.
- Areas of biodiversity importance.
- Habitats and land cover.
- Existing anthropogenic impacts, include infrastructural development (HQ complex, ranger stations, homestead, farmsteads, agricultural lands, and other deforested areas), and linear utilities such as roads and powerlines.
- The presence of high-intensity human activity in very close proximity to the protected area.
- Existing high-value visitor areas.



The defined zoning categories are as follows (described from least intensive to most intensive use):

Wilderness Zone (8.67 km² or 11%)

This zone includes the higher elevations of the Reserve, including Jabal Shada Peak. This zone is largely pristine, is only accessible by foot, and is characterized by very steep mid-slopes and vertical scarp faces.

Wildland Zone (40,69 km² or 52%)

This zone almost exclusively includes the steeper gradients and undisturbed areas of the Reserve.

Managed Resource Use Zone (28,32 km² or 36.5%)

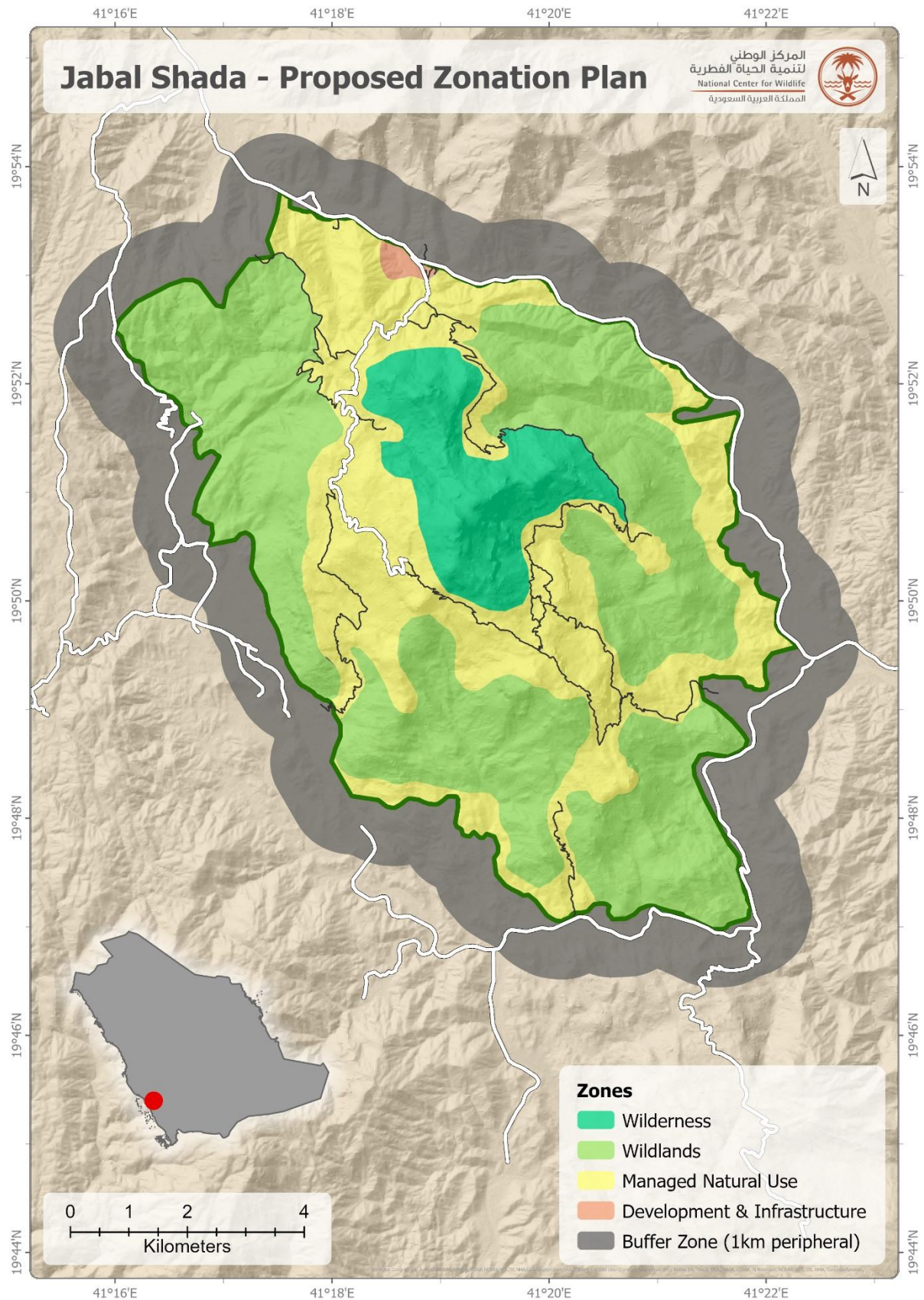
The Managed Resource Use Zone covers areas that are moderately disturbed, are easily accessible by vehicle, and in most cases include man-made structures (most notably, Shada village) and utilities, a patchwork of cultivated lands, most of which are serviced by a network of 4x4 tracks.

Development and Infrastructure Zone (0,38 km² or 0.5%)

The Development and Infrastructure Zone covers areas that are heavily disturbed, are easily accessible by vehicle, and in most cases include man-made structures and utilities. Importantly, this includes an area in very close proximity to the main entrance to the Protected Area and the Protected Area HQ.

Buffer Zone

A dedicated buffer zone is an important component of the zonation for Jabal Shada to secure protected integrity and enable close collaboration between protected area staff and neighboring communities. Conceptually it is envisaged as a 1000m buffer, but on the ground, hard barriers as well as natural catchment boundaries will modify its location as agreements are secured.



Map 4: Proposed zonation for Jabal Shada PA



5.3. OPERATIONS

The PA's operations aim to achieve its conservation vision and objectives. To meet these goals, there is a clear need for upscaling and expanding operations and enhancing operational capacity. This requirement spans various aspects of the PA's management, including law enforcement and protection, zoning, wildlife re-establishment, habitat restoration, tourism, community engagement, and research and monitoring.

Detailed planning and execution of these activities, as outlined in various supporting plans, are instrumental in guiding the PA toward achieving its conservation goals effectively and sustainably.

Details are described in each of the accompanying plans as follows:

- PA's operations & Governance Structure (Operational plan)
- Community outreach (Contact and Communication Plan)
- Zoning (Zoning Plan)
- Tourism plan implementation (Visitor Management Plan)

SECTION SIX: ENABLERS AND IMPLEMENTATION PLAN

6.1. OPERATIONAL DESIGN

6.1.1. GOVERNANCE STRUCTURE

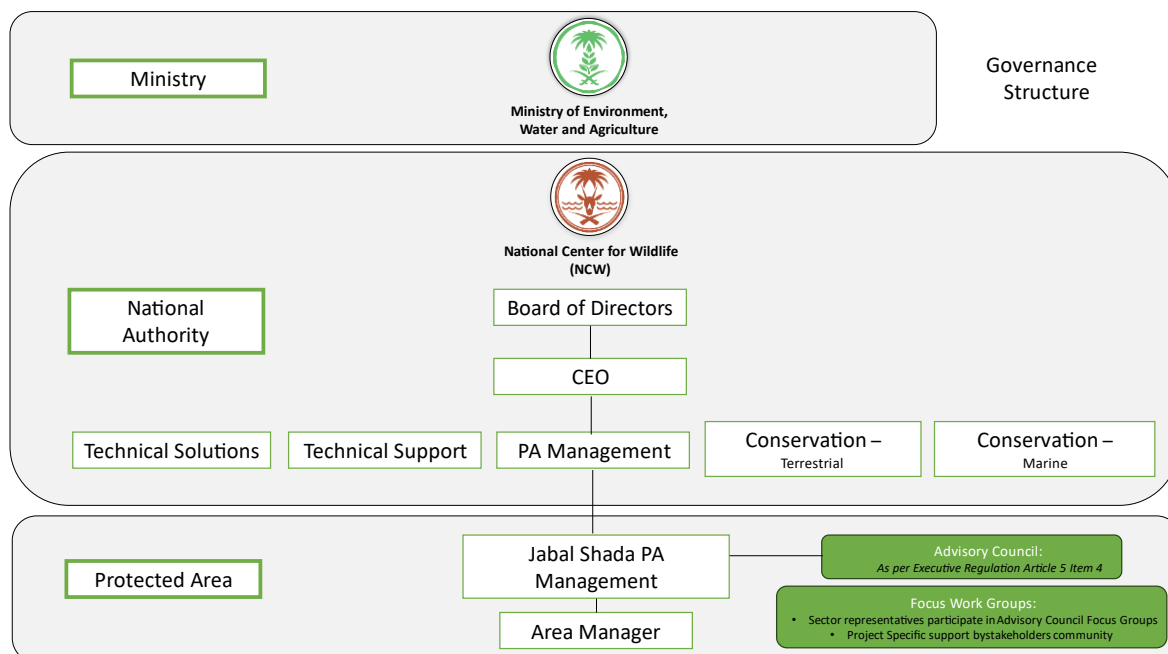


Figure 6: National Level Governance Structure

The current national-level governance structure for the Jabal Shada Protected Area is considered adequate. However, devolving implementation responsibilities to the local level is essential to effectively achieve the management plan's objectives. This devolution is crucial for addressing Jabal Shada's unique challenges, such as managing the steep terrain, invasive species, and community-driven pressures like livestock grazing and agriculture. Relying solely on centralized operations could severely hinder progress, making building site-level capacity tailored to the PA's specific needs necessary. The proposed departmental and organizational structure supports this localized capacity, allowing Jabal Shada to function semi-autonomously within the national authority's framework while ensuring timely and effective management responses.

6.1.2. ORGANIZATION

Departmental Structure & Functions

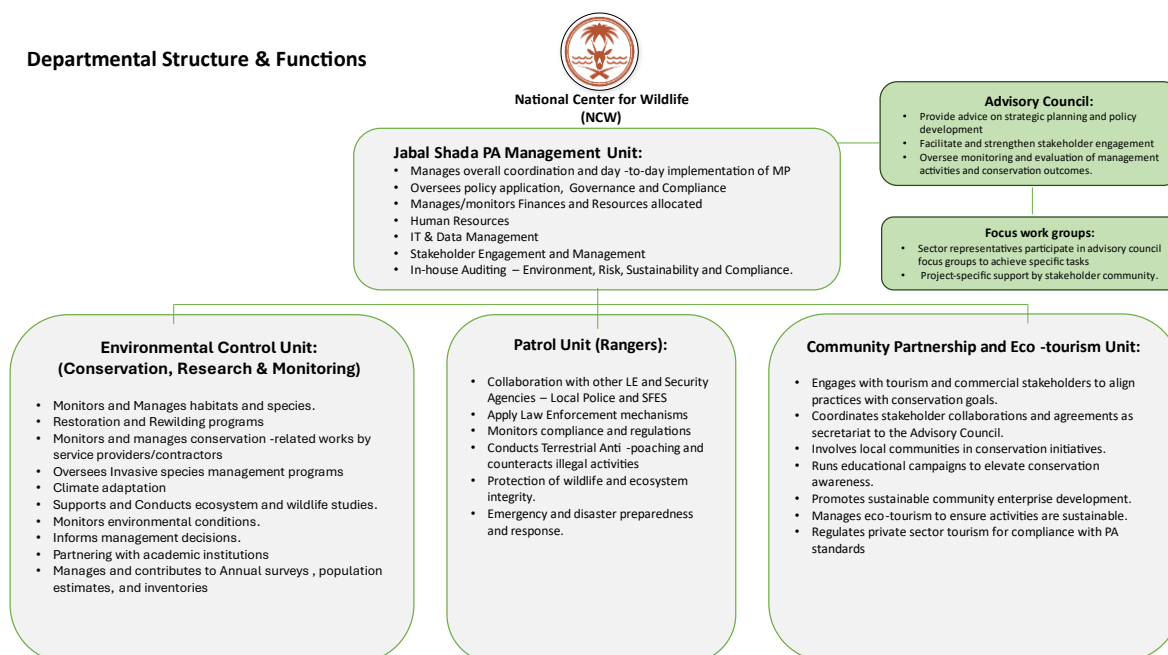


Figure 7: Proposed Departmental Structure

The staffing organizational structure proposal is tailored to align with the principles of devolution and semi-autonomy. This design aims to empower the PA to independently and effectively address its unique challenges and manage day-to-day operations. The structure is reflective of the necessary site-level capacity, allowing the PA to operate efficiently while adhering to guidance from the national authority, advisory council, and management plan.

6.1.3. PEOPLE

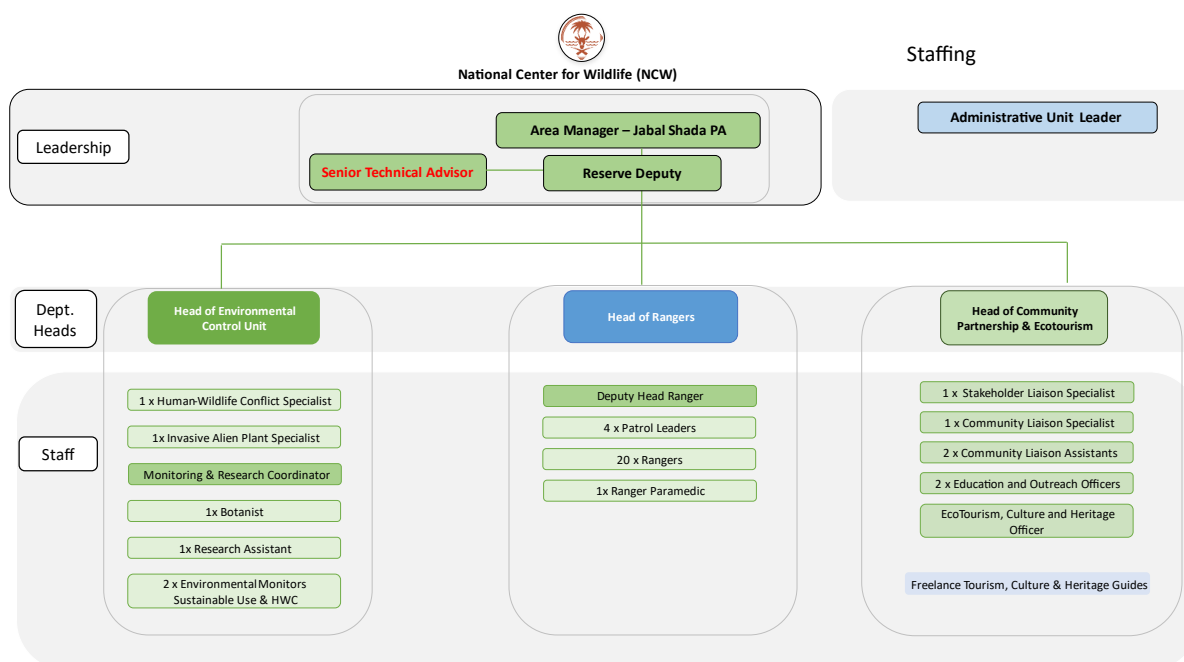


Figure 8: Staff



Rationale: 5-year progressive capacity building and staffing

To realize its full restoration and conservation potential, Jabal Shada Protected Area must significantly enhance its current staff capacity, training, support services, and management. The existing staffing and human resources are currently sufficient to meet the PA's objectives and vision. And in the future the site needs expansion and One of the first steps in this expansion will be appointing department heads for various functions, including conservation, tourism, and community outreach. Additionally, hiring technical advisors with hands-on experience will be critical, ensuring that each operational aspect aligns with the PA's vision and objectives. Practical experience must remain a priority in recruitment to ensure the successful implementation of restoration and conservation initiatives.

The National Center for Wildlife (NCW) is committed to improving gender equity, aiming for women to represent 30% of the Jabal Shada workforce by 2030. Women's involvement in the PA will not only contribute to operational success but also serve as role models for young girls, inspiring future career choices. Furthermore, women on the team will play a key role in environmental education, particularly when engaging with local women and girls in surrounding communities.

The accompanying operations plan will detail the full staffing requirements and progressive capacity-building strategy. The figures provided are indicative and based on estimates aligned with the proposed vision and objectives outlined in this document.

6.2. RISK MITIGATION APPROACH

To ensure the sustainability of Jabal Shada PA, including the safety of its wildlife, natural assets, and staff, it is essential to develop proactive and preventive risk mitigation strategies at all levels. This approach helps avoid the pitfalls of reactive measures, which are often costlier and less effective, as they address issues only after damage has occurred.

The Risk Mitigation Strategy aims to identify, assess, and manage risks that could impede the implementation of the Management Plan. This strategy must be integrated into both the plan and daily operations to ensure resilience and adaptability in facing uncertainties.

Key Elements of the Risk Mitigation Strategy:

- **Unified Risk Management:** Promote a consistent organizational approach through training and standardized protocols. Ensure all staff and visitors are informed of potential risks.
- **Informed Decision-Making and Resource Allocation:** Integrate risk assessments into decision-making processes and resource allocation. Establish a dedicated risk management budget and committee to oversee these efforts.
- **Strategic Foresight and Scenario-Based Planning:** Anticipate future risks through scenario-based planning and regular reviews. Develop plans and allocate resources for various potential scenarios.
- **Innovative Solutions:** Explore and implement innovative risk management approaches, such as advanced wildlife monitoring technology and habitat restoration techniques.
- **Transparency and Governance:** Foster a transparent approach to governance and communication. Engage stakeholders in risk management efforts and maintain clear communication channels.

6.3. IMPLEMENTATION STRATEGY

6.3.1. INFRASTRUCTURE DEVELOPMENT



There are key areas of conservation management infrastructure in Jabal Shada that need to be prioritized and developed: facilities and buildings for management, the road and track network, communication systems, and strategic fencing. Each of these elements is essential for improving the effectiveness of conservation efforts and ensuring the long-term sustainability of the protected area.

Table 13: Development schedule for infrastructure.

ACTIONS	2025	2026	2027	2028	2029	2030
<i>Consultant Engagement: Hire a consultant to evaluate the current road network and recommend erosion control measures and mitigation.</i>						
<i>Erosion Control and mitigation implemented. Gabions, Drainage</i>						
<i>Ranger Station Upgrades: Conduct necessary annual maintenance, repairs, and upgrades to existing Main station.</i>						
<i>Erect radio communication tower and repeater system on the Jabal Shada Peak</i>						
<i>Mobile Ranger Stations: Procure and deploy two mobile ranger stations</i>						

6.3.2. TOURISM DEVELOPMENT

The visitor management plan recognizes the 2030 Vision for the Kingdom and consequently projects massive growth in the local and foreign tourism market. In response to these projections, as well as the opportunities and constraints offered by the PA, several nature, adventure, and cultural-based tourism experiences have been identified as appropriate for the development of tourism within the PA.

The tourism development plan for the PA harnesses the many opportunities provided for the development of nature-based, adventure, cultural, and agrotourism. The PA also provides opportunities for specialist pursuits such as birding, as well as opportunities for extreme or high adrenalin sports.

Three key tourism focus areas (TFAs) have been identified to accommodate the abovementioned activities.

- TFA 1: The mid-elevation areas of the PA, especially in the south-west, are characterized by villages and small-scale farmlands. These areas are ideally suited for homestays with immersive cultural experiences where visitors can engage with the local culture, way of life, and cuisine. This area also presents great opportunities for agrotourism, especially related to the bee farming and coffee growing that is so prevalent.
- TFA 2: The midslope areas, especially in the northeastern sections of the PA, provide excellent opportunities for guided 4x4, e-quadbike, or pony trails. Numerous 4x4 tracks wind their way around the mountain side linking several smaller settlements and farming communities.
- TFA 3: The core of the PA, viz. the Wilderness Zone which encompasses the higher-lying, pristine mountainous areas, is predisposed to non-motorized adventure tourism and extreme sports. This area can accommodate overnight hiking trails with sleep-out options in caves, as well as rock climbing, abseiling, and paragliding.

It is strongly recommended that the local community be encouraged and empowered to fully participate in the tourism plan for the area through the development of homestay amenities, specialist guiding and interpretation, and agrotourism.



The tourism development plan makes provision for the development of camping and day visitor facilities. These facilities are linked by 4x4 routes and non-motorized trails, allowing visitors to traverse the breadth of the PA. Provision is also made for a mid-market eco-lodge in the Shada village that can be used as a base for further exploration of the PA.

Within the PA, provision is made for a total visitor capacity of 272 visitors daily or approximately 40,000 visitors annually at a 40% occupancy, with a strong bias towards accommodating the local, regional, and GCC markets.

Table 14: Development schedule for tourism facilities

ACTIONS TO BE UNDERTAKEN	2025	2026	2027	2028	2029	2030
<i>Concessions/lease agreement process undertaken with the private sector for management of all visitor activities and facilities</i>						
<i>Detailed designs for tourism developments drafted</i>						
<i>Environmental Impact Assessments undertaken.</i>						
<i>Visitor Centre developed at the main gate.</i>						
<i>Viewpoints points, hides, trails, and signage developed (within the PA)</i>						
<i>2x Day visitor sites developed, 40 visitors each (Shada village and south gate)</i>						
<i>3x Pitch and strike campsites developed</i>						
<i>Mountain eco-lodge developed</i>						
<i>Local guides recruited, trained, and equipped.</i>						
<i>Environmental education, training, and participatory programmes developed</i>						
<i>Environmental monitoring of visitor impact on biodiversity and habitats</i>						
<i>Environmental monitoring and auditing of all visitor activities and facilities</i>						
<i>Visitor satisfaction & feedback monitoring system in place</i>						
<i>LACs are established and adjusted based on visitor satisfaction and environmental monitoring.</i>						

It is anticipated that concessioned tourism facilities will be developed by the concession operators on a Build, Operate, and Transfer (BOT) basis, and will all become operational by 2028.



6.3.3. OPUNTIA ERADICATION PROGRAMME

Opuntia spp are by far the most prominent and threatening alien invasive species known to occur in the PA. Both PA management and the resident community have recognized it as a threat to biodiversity integrity and livelihoods respectively. The aim of this program is by 2030 to have eradicated *Opuntia* from at least 95 % of its current range in the PA, including the Sustainable Use Zone.

Table 15: Development schedule for *Opuntia* eradication

ACTIONS TO BE UNDERTAKEN	2025	2026	2027	2028	2029	2030
<i>Engage a consultant to develop an Opuntia eradication and control programme.</i>						
<i>Train management staff and equip them with the technical skills to implement an Opuntia eradication programme.</i>						
<i>Implement Opuntia eradication and management plan.</i>						

6.3.4. COMMUNITY MANAGED SUSTAINABLE RESOURCE USE ZONES

Since the areas designated as Sustainable Resource Use Zones overlap spatially with the area identified as the area of biodiversity importance, residents must understand this and are fully capacitated to undertake their livelihood activities in a manner that minimizes impact on important biodiversity and ecological processes. The overall aim of this intervention therefore is to: Ensure no net loss of biodiversity within the designated Sustainable Resource use Zones.

Table 16: Development schedule for Sustainable Resource Use Zones.

ACTIONS TO BE UNDERTAKEN	2025	2026	2027	2028	2029	2030
<i>Establish rightful beneficiaries of resources in the Sustainable Resource Use Zone.</i>						
<i>Engage a consultancy to develop a resource use guideline incorporating Indigenous knowledge.</i>						
<i>Commence implementation of resource use guidelines through collaboration and extension.</i>						
<i>Adaptively manage the implementation of resource use guidelines.</i>						

6.3.5. NUBIAN IBEX RE-ESTABLISHMENT PROGRAMME

Jabal Shada is well within the historical range of Nubian Ibex and its re-establishment within the PA would both add value to the conservation importance of the PA as well as contribute significantly towards improving the species status. With a higher rainfall and vegetation productivity than other desert protected areas in Saudi Arabia, Jabal Shada once secured could act as a breeding area for ibex from where they could be removed live for translocation to other protected areas or for designated hunting areas.

The proposed 2030 goal for Ibex re-establishment is:

Re-establish a minimum founder population (minimum 20 surviving founders) of Nubian ibex, in the re-establishment zone and based on population responses, develop a plan for future extension of the boundary fence and expansion of the population in the PA to a point where it can be live harvested for translocation to other PA's.



A recommended development schedule is outlined in the table below.

Table 17: Development schedule for Ibex re-establishment.

ACTIONS TO BE TAKEN	2025	2026	2027	2028	2029	2030
<i>Fence off east eastern PA boundary and implement strict access control</i>						
<i>The northern and Southern extensions of the fence to the steep inaccessible ground</i>						
<i>Procure 20 Nubian ibex in the sex ratio of 8 Males to 12 Females.</i>						
<i>Free release of Nubian Ibex into the re-establishment zone</i>						
<i>Post-release monitoring of Ibex releases</i>						

6.3.6. BABOON CONFLICT MANAGEMENT PROGRAMME

The escalating conflict between humans and baboons in the PA is loudly voiced by management and the resident human population. This affects tourism attractiveness, litter management, and livelihoods of people living within and on the periphery of the PA. The resolution of this conflict at the PA level is complicated by the fact that there is a dispersed resident population of people within the PA making the resolution complex and beyond the scope of this plan. We, therefore, recommend that a dedicated consultancy be engaged to study the problem in detail and collaborate with management and residents to develop a plan for a lasting solution to the problem.

Table 18: Development schedule for baboon conflict mitigation.

ACTIONS	2025	2026	2027	2028	2029	2030
<i>Engage consultancy to develop a PA-specific baboon conflict management plan.</i>						
<i>Implement management plan, learn, and adapt through implementation.</i>						

6.3.7. WASTE MANAGEMENT

Waste management requires the following steps:

- Engage with a waste management and disposal group to identify and quantify all waste streams and waste types within the PA (including rating the potential for reduction or recycling) then prepare a detailed waste management plan.
- Develop and implement a waste reduction strategy and targets.
- Outline the expected structure and content of a typical tourism establishment waste management plan.
- Formalize waste management agreements with municipalities and neighboring villages.
- Prepare waste management plan for NCW-operated tourism facilities.
- Prepare and implement a waste education and awareness strategy.

Table 19: Waste management activity schedule.



ACTIONS TO BE UNDERTAKEN	2025	2026	2027	2028	2029	2030
<i>Engage waste management company to quantify waste streams and prepare waste disposal plan.</i>						
<i>Implement a waste disposal plan.</i>						
<i>Formalize waste management agreements with municipalities and neighboring villages.</i>						
<i>Prepare a waste management plan for NCW-operated tourism facilities and implement it.</i>						
<i>As part of the outreach programme assists neighboring communities in developing waste awareness and disposal strategies.</i>						

6.3.8. CLIMATE CHANGE MITIGATION AND ADAPTATION

Climate change is expected to have significant impacts on central Saudi Arabia including increased temperatures and evaporative demand, reduced precipitation (overall decrease in mean annual rainfall), and increased drought frequency. It is not clear as to the actual impacts this will have on biodiversity yet. From a protected area perspective other than regulating carbon dioxide emissions few actions can be implemented that will affect global change. At a protected area level, the following strategy roadmap is advocated:

- Keep CO₂ emissions to the minimum based on the essential use of fossil fuels.
- Maximize the use of solar and wind as an energy source in buildings and transport.
- Reduce utilization stress (grazing and browsing) on plants to compensate for increased climate-induced stress.
- Reduce increased runoff caused by poorly aligned road networks and poor drainage.
- Assess the potential impacts of climate change on the protected area and its biodiversity and monitor changes based on likely impacts (Climate change impact assessment).

Table 20: Development schedule for climate change and mitigation.

ACTIONS TO BE UNDERTAKEN	2025	2026	2027	2028	2029	2030
<i>Audit CO₂ emissions and set and implement targets to minimize them.</i>						
<i>Incorporate renewable energy generation and storage into all new building construction.</i>						
<i>Implement herbivore plant utilization regimes that will compensate for climate change-induced stress on plant life.</i>						
<i>Design road network to minimize water runoff and capture by poorly aligned roads and tracks</i>						
<i>Assess the potential impacts of climate change and monitor changes based on likely impacts.</i>						



6.3.9. ZONING PLAN PHASING STRATEGY

The implementation of the zoning plan will be aided by the following:

- Discuss proposed zoning within NCW (conservation specialists and management staff) as to applicability and detailed boundary alignment.
- Revise zoning based on feedback (including fine-scale adjustment to make it easier to recognize zone boundaries in the field (alignment with roads or track or with natural features);
- Demarcate zone boundaries where necessary (this is only to avoid conflict or unintended impacts where zone boundaries are difficult to visualize).
- Disseminate zoning typology to staff to be familiar with the do's and don'ts of each zone;
- Inform relevant external stakeholders, especially where it concerns tourism operators, of the boundaries of the zones and their do's and don'ts.
- Ensure in-house capacity to understand zoning maps, zoning typology, and the potential or actual impacts of developments and activities.
- Awareness building amongst staff and relevant stakeholders as to the boundaries of the zones and the associated restrictions.
- Ensure in-house capacity (new appointment or training).
- Investigate the need for 'micro zonation' of ecologically sensitive hotspots, where a higher level of protection may be required.

6.4. MONITORING APPROACH

Monitoring, evaluating, and reporting the implementation of the management plan and the outcomes of protected area management activities is a critical activity in the day-to-day management of a protected area. Monitoring and evaluation form the basis of the adaptive management and learning cycle.

- Monitoring, evaluation, and reporting enable the objective assessment of the outcomes of management interventions and, if necessary, their modification to achieve the vision and objectives of the protected area.
- Monitoring should be designed and implemented to determine the effectiveness of the implementation of the protected areas management plan and as such should be designed to be straightforward and practical for implementation by on-site staff.
- Records of key management interventions should be maintained, as set out in the management plan.
- Scientific monitoring programs may be established to monitor specific management interventions such as those that relate to the need to understand vegetation biomass and composition change, species diversity changes, wildlife population performance and trend, and specific measures required for individual species.
- The outcomes of the monitoring process must be captured in an appropriate report linked to the management cycle. The results should then be used to inform the plan of operation that is developed for the discipline in the following management cycle or iteration.
- Transparency in communicating outcomes must be instituted as part of the monitoring, evaluation, and reporting process to ensure that the protected area maintains legitimacy regarding the activities and developments undertaken within it.
- A critical component of any monitoring endeavor is the storage and safekeeping of the results. Data management is commonly documented in a data management plan. (Soler, 2016) provides a valuable introduction to data management, and an essential starting point for developing a deeper understanding of monitoring biodiversity in protected areas (Dalton, 2024).

The basic monitoring requirements per domain are presented below.



Table 21: Basic monitoring requirements per domain

DOMAIN	MONITORING REQUIREMENTS
<i>Biodiversity Conservation</i>	<ul style="list-style-type: none"> Climate monitoring – at least 1 automatic weather station at the headquarters and 3 manual rain gauges read daily - one southwest ranger station one southeast east ranger station and one at the village below Jabal Shada. Vegetation greenness – PA wide download of MODIS/Terra Vegetation Index 16-Day 250m. Long-term understanding of vegetation recovery and comparison with sustainable use zones and beyond Rare and endemic plant species abundance monitoring. Amphibia species richness and abundance monitoring. Population trend of re-established ibex population. Animal body/ physical condition as a proxy of habitat quality. Monitor species interactions (intensity of competition – if any). Monitor timing, duration, and frequency (presence/ absence) of habitat occupancy. Monitor wildlife distribution which reflects habitat preference/habitat selection. Monitor the quality and quantity of key habitat attributes (food, water, nesting sites, cover, etc.). Monitor demographic attributes (species density, survival, and reproduction). Monitor the intensity and extent of the threats. Monitor health status, body conditions, and activities of key indicator species such as predatory birds and ungulates.
<i>Visitor Mgt. & Tourism</i>	<ul style="list-style-type: none"> Visitor numbers with information on the date of visit, entrance point used, and provenance (local, GCC, international) Visitor satisfaction
<i>Community Engagement;</i>	<ul style="list-style-type: none"> Number of jobs filled by local people (annually) The number of community groups formed. Number of community members registered. Monetary amount in beneficitation through local service contracts and supplies (annually) Number of active resource management committees or cooperations
<i>Park Management</i>	<ul style="list-style-type: none"> Monthly inspections of park infrastructure to identify and address maintenance needs Quarterly reviews of resource allocation and utility usage Regular compliance and enforcement audits covering health and safety, environmental, risk, and law enforcement to ensure policies are being followed Annual protected area management effectiveness assessment (Stolton, 2007)
<i>Sustainability (Waste, energy, climate change, pollution control)</i>	<ul style="list-style-type: none"> Measurement of water use at each of the sites where amenities are provided Bi-annual environmental audit



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