
Protected Areas in the Occupied Palestinian Territories

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ABSTRACT

National designation and management of protected areas (PAs) are critical components in the global effort for biodiversity conservation and environmental protection. In areas of conflict like Palestine, this task becomes more complicated but is even more important considering the environmental challenges posed by colonialism and occupation. Nineteen protected areas were partially or wholly turned over to the Palestinian National Authority and, in 2010, seven others were designated by the Environmental Quality Authority for a total of 26. In 2015, the Palestinian ministerial committee approved a list of 49 protected areas but most of these fall in parts of the Occupied Palestinian Territories (OPT) that are under direct control by the occupying power. In effect only 8 protected areas totaling less than 15 km² are under Palestinian effective control making management difficult. In this paper we describe the status of protected areas and make a SWOT analysis and recommendations for issues of protected areas in OPT.

Keywords: Protected areas, Biodiversity, Palestine.

INTRODUCTION

The world's protected areas have grown in terms of land size and number of designated sites but there are many remaining challenges to having them provide a critical safeguard against habitat loss and other human activities that decrease biodiversity (Chape et al. 2008). Palestine as a nascent state still falls far behind on implementing provisions of the Convention on Biological Diversity (CBD) partly because it is a state that does not control most of its biodiversity important areas (EQA, 2015). The Palestinian Agriculture Law No. 2 for the year 2003 Article 1 of section 1 defines a protected area as: "A geographically delineated area that is organized and managed for the purpose of its protection and to conserve its biodiversity". Article 9 of section 1 states that: "The Ministry in cooperation with other competent authorities shall develop a protected areas management plan and conserve all plants and living organisms living in protected areas". Continuous increase in human populations as well as the demand for economic development has

severely affected all areas of Palestine, and the protected areas just might be our last hope of preserving our shrinking biodiversity; especially in an unstable political situation (UNEP, 2003; Garstecki *et al.*, 2010).

During the Israeli occupation since 1967, 48 natural reserves have been declared in the West Bank, with a total area of 69,939 hectares; forming 12.35% of the total area of the West Bank. However, the National Spatial Plan indicates that the total area of natural reserves in the West Bank is 51,157 hectares forming 9% of the total area of the Palestinian Territories (Isaac & Hilal, 2011). More recent detailed studies from the Applied Research Institute-Jerusalem (ARIJ) show a total of 576,491 dunums of Israeli designated PAs forming 10.2% of the West Bank region (ARIJ, 2015). The Palestinian Authority has expressed concern that some of these PAs have been established mainly for Israeli military objectives and for settlements, rather than conservation goals (UNEP, 2003). No PAs have been designated by Israel in Gaza, but the Palestinian Authority declared the Wadi Gaza protected area in June 2000.

Wadi Al-Quff is the first Palestinian protected area well studied in terms of fauna and flora and with a reasonable management plan (EQA, 2014; Qumsiyeh *et al.*, 2018). Another area being investigated intensively by our group is Wadi Zarqa Al-Ulwi (funded by UNDP/GEF/SGP). Very limited information is available on the fauna of the West Bank and most of it is from older literature that needs updating (e.g. Tristram, 1885; Bodenheimer, 1935; Qumsiyeh, 1996) or from nearby parts of Palestine (e.g. Zohary, 1966, 1972). The nascent Palestine Museum of Natural History (PMNH) started to change this (Qumsiyeh *et al.*, 2017) resulting in a number of scientific publications (e.g. Adawi *et al.*, 2017; Abusarhan *et al.*, 2016, 2017; Amr *et al.*, 2016; Handal *et al.*, 2015, 2016; Qumsiyeh *et al.*, 2013, 2014a,b; Salman *et al.*, 2014).

In this paper, we will briefly review the status of other protected areas in the Occupied Palestine Territories under the current political state, identify the authorities responsible for managing and protecting protected areas, and give recommendations for what can be done to preserve the rich areas in Palestine.

CURRENT PROTECTED AREAS

Israeli authorities handed over land belonging to 19 distinct areas to the Palestinian National Authority as PAs under the Oslo Agreements. Fifteen of these areas were studied in detail including a SWOT analysis for each area by the IUCN in collaboration with the Environmental Quality Authority (EQA) and key stakeholders (Table 1). In addition, the latter study analyzed seven more areas suggested by the EQA (four fully handed over to the Palestinian Authority): Al-Qarrin (50 dunums), Deir Razzeh (350 dunums), Ein Al-Uja (30,000 dunums but 0 handed over), Suba (200 dunums), Um Al-Safa (1500 dunums, 300 handed over), Wadi Al-Quff (2500 dunums), and Wadi Al-Qilt (15,000 dunums, 0 handed over).

Table 1. List of protected areas handed over to the Palestinian Authority under the Oslo agreements (Garstecki *et al.*, 2010). Area is area handed over in dunums and not the total area of the potential protected area.

Protected area	Governorate	Area (Dunum)	Habitat type
Al-Hashmee	Ramallah	200	<i>Pinus halepensis</i> and <i>Arbutus andrachnae</i> woodland
Deir Ammar	Ramallah	120	<i>Pinus halepensis</i> woodland
Ein Darra	Ramallah	250	<i>Quercus calliprinus</i> woodland on limestone
Fahmeh	Jenin	400	Semi-steppe batha
Jabal-Alkabeer	Nablus	9,500	Semi-steppe batha
Jerusalem Wilderness	Hebron and Bethlehem	172500	Steppe vegetation
Sheikh Katrawny	Ramallah	11	<i>Quercus calliprinus</i> woodland on limestone
Sheikh Zeyd	Nablus	52	<i>Quercus calliprinus</i> woodland on limestone
Shoubash	Jenin	5,000	<i>Ceratonia siliqua</i> and <i>Pistacia lentiscus</i> forest
Sirris	Jenin	1,118	<i>Quercus calliprinus</i> woodland on limestone
Tammoun	Tubas	4,300	Semi-steppe batha
Tayyasir	Jenin	1,200	<i>Ceratonia siliqua</i> and <i>Pistacia lentiscus</i> forest
Um-Altutt	Jenin	320	<i>Quercus calliprinus</i> woodland on limestone
Wadi Al-Dilb	Ramallah	800	<i>Quercus calliprinus</i> woodland on limestone
Wadi Zarqa Al-Elwey	Salfeet	2,700	<i>Quercus calliprinus</i> woodland on limestone

The 26 areas are varied in habitat and size. Al Qarin is only 50 dunums surrounded by agricultural and residential areas (including Al-Arroub refugee camp) while the Jerusalem Wilderness is over 172 km². These PAs include critical forested and other habitats with high biodiversity (ARIJ, 2013). However, most of them are located within Area C and under control of the Israeli civil administration and only 13 are within the Areas A and/or B accounting for 1.3% of the total reserve area and are therefore under Palestinian control (Görlach *et al.*, 2011; ARIJ 2015; EQA, 2015). The Ministry of Agriculture (MOA) through its Directorate of Forests, Rangelands and Wildlife has offices in all governorates in the OPT. 40 rangers are responsible for inspecting and patrolling protected areas and natural forests. The active areas they manage are 8 areas with a total of less than 15 sq km of land accounting for less than 1% of the protected areas (Table 2, Figure 1).

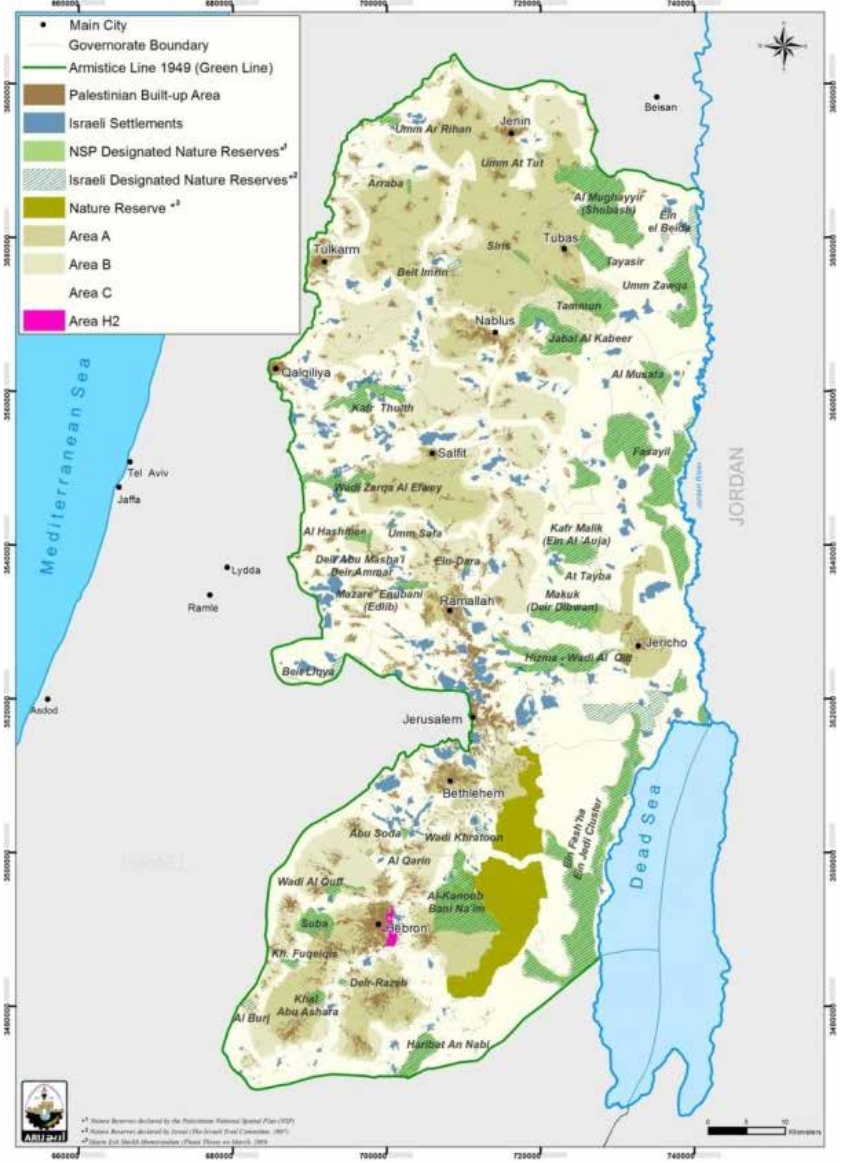


Figure 1: Protected areas in Palestine showing administrative areas (Isaac & Rishmawi, 2015).

Table 2: Protected areas under active management by the Ministry of Agriculture

Protected area	Governorate	Area in Dunums
Tayyasir	Jenin	1200
Sirris	Jenin	1118
Um-Altutt	Jenin	320
Shoubash	Jenin	5000
Tammoun	Tubas	4300
Al-Hashmee	Ramallah	200
Al Qarin	Hebron	50
Wadi Al-Quf	Hebron	2500
Total		14688

On 3 February 2015, the Palestinian Council of Ministers approved the recommendations of the National Committee for the Geographical Names in Palestine (consisting of members from the EQA, MOA and the MOPAD) on recognizing and approving protected areas in Palestine. This document includes 49 protected areas with their names and their locations. These names are approved and all governmental institutions are obliged to use them. Below we discuss those in the West Bank under three categories: Northern West Bank (Jenin, Salfit, Tubas, and Nablus governorates), Central West Bank (Jerusalem and Jericho governorates), and Southern West Bank (Bethlehem and Hebron Governorates).

NORTHERN WEST BANK

Jenin Governorate: Of the five proposed reserves, three were handed to the PA after the Oslo Agreement; Um Al Tut (=El Marj Protected area), Sirris (=El Miksar Protected area) and Fahmeh (=Dhahrat Hayis Protected area) (Table 3, Figure 2). The other two proposed reserves are new additions to the protected areas network. More data on the area, and biological and ecological characteristics are required to classify these reserves.

Table 3. Proposed protected areas in Jenin Governorate (Council of Ministers, 2015).

Proposed name in English	Proposed name in Arabic	Name on original documents
Umm er Rihan	محمية أم الريحان	أم الريحان
Jabel el Aqra	محمية جبل الاقرع	عراية
Dhahrat Hayis	محمية ظهرة حايس	فحمة
El Marj	محمية المرج	أم التوت
El Miksar	محمية المكسر	سيريس

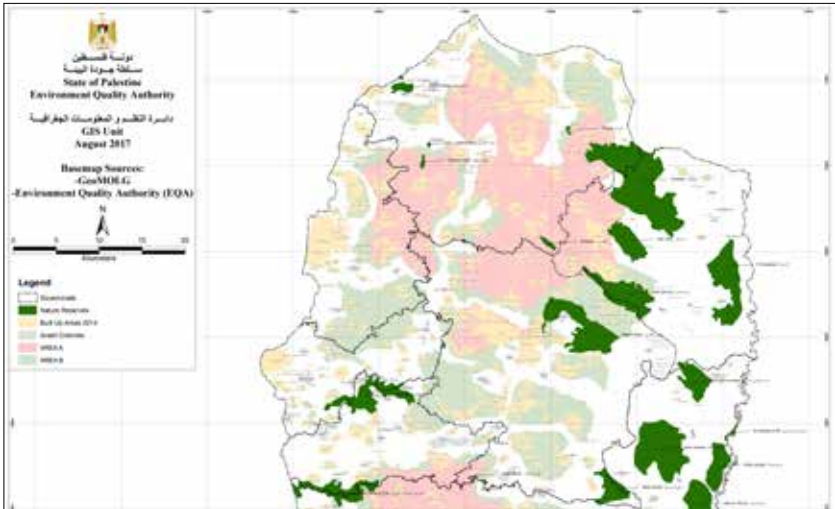


Figure 2: Proposed protected areas in Northern West Bank (Council of Ministers, 2015).

Tubas Governorate: Garstecki *et al.* (2010) listed both Shoubash (=Shubash) and Tayyasir (=Ras Jadir) protected areas in Jenin Governorate. Now both reserves are listed under Tubas Governorate (Council of Ministers, 2015). Only Jabal Tammun protected area is listed in Tubas (Garstecki *et al.*, 2010). All the three reserves were handed to the PA after the Oslo Agreement (Table 4, Figure 2). El Muzawqa is a new proposed protected area. More data on the area, biological and ecological characters are required for classification.

Table 4. Proposed protected areas in Tubas Governorate (Council of Ministers, 2015).

Proposed name in English	Proposed name in Arabic	Name on original documents
Shubash	محمية شوباش	المغير – شوباش
Ras Jadir	محمية راس جادر	تياسير (Har Gadir)
El Muzawqa	محمية المزوقة	امزوقة (Um Zawqa)
Jabel Tammun	محمية جبل الطمون	ظمون

Nablus Governorate: A total of three protected areas are listed (Table 5, Figure 2). Jabel el Kabir protected area is among the areas handed to the PA after the Oslo Agreement. Jebel Taruja and Wadi er Rashshash protected areas are two new proposed areas. Both requires additional surveys to identify their biological and ecological characteristics. The status of Sheikh Zeyd remains to be verified from the list proposed by Garstecki *et al.* (2010).

Table 5. Proposed protected areas in Nablus Governorate (Council of Ministers, 2015).

Proposed name in English	Proposed name in Arabic	Name on original documents
Wadi er Rashshash	محمية وادي فصايل	No name assigned
Jebel Taruja	محمية جبل طاروجا	No name assigned
Jabel el Kabir	محمية جبل الكبير	الجبل الكبير (Har Kabeir)

Ramallah and Al Bireh Governorate: In total, 13 protected areas were listed in the Palestinian Ministerial Cabinet list (Table 6; Figure 2). Wadi Ein ez Zarqa el Elwi was listed under Salfit Governorate and Al-Hashmee under Ramallah governorate as handed reserve after the Oslo Agreement by Garstecki *et al.* (2010) but both straddle the two governorates. Ein Darra (=Ein el Maghara), Deir Ammar (=Wadi Jannata), Wadi el Dilb and Esh Sh. Qatrawani were handed reserves after Oslo Agreement by Garstecki *et al.* (2010). Ein el Auja is proposed by Garstecki *et al.* (2010) as part of Jericho Governorate. The proposed Um Al-Saffa PA by Garstecki *et al.* (2010) is now subdivided into three new protected areas namely Ein Dara, Ein et Tileib and Ein Qawabish (Council of Ministers, 2015). Additional proposed reserves include Qubbat en Najma, Wadi el Makkuk, Latur and En Nabi Gheit. Verification for size of these proposed protected areas are needed as well as baseline surveys for their biological and ecological features. Wadi Ein ez Zarqa el Elwi is the first one in the Northern West Bank to be investigated scientifically now with significant data collected by the team of the Palestine Museum of Natural History at Bethlehem University producing data that shows rare species, some new, and some with new distributions. It is a remarkable area but under significant threats from both local activities and Israel occupation activities such as the wall and industrial settlements (Hammad & Qumsiyeh, 2013 and several publications forthcoming).

Table 6. Proposed protected areas in Ramallah and Al Bireh Governorate (Council of Ministers, 2015).

Proposed name in English	Proposed name in Arabic	Name on original documents
Wadi Ein ez Zarqa el Elwi	محمية وادي عين الزرقا العلوي	وادي الزرقا العلوي
Ein Dara	محمية عين دارة	غابة ام الصفا
Ein et Tileib	محمية عين الطليب	غابة ام الصفا
Ein Qawabish	محمية عين قوابيش	غابة ام الصفا
Wadi Jannata	محمية وادي جناتا	دبر ابو مشعل - دبر عمار - زرقا
Ein el Maghara	محمية عين المغارة	عين دارا
Wadi el Dilb	محمية وادي النلب	(مزارع النوباني) (النديب)
Ein el Auja	محمية عين العوجا	(كفر مالك) (ناحال بيتاف)
Qubbat en Najma	محمية قبة النجمة	No name assigned
Wadi el Makkuk	محمية وادي المكوك	ناحال مكوك
Latur	محمية اللطرون	No name assigned
Esh Sh. Qatrawani	محمية الشيخ القطرواني	No name assigned
En Nabi Gheit	النبى غيث	No name assigned

CENTRAL WEST BANK

Jerusalem Governorate: Two protected areas were listed in the Palestinian Ministerial Cabinet list (Table 7; Figure 3). Wadi Al Qilt protected area (Figure 4) is shared between Jericho and Jerusalem. Marj ez Zarur is a new proposed protected area by the Palestinian Ministerial Cabinet list (2015).

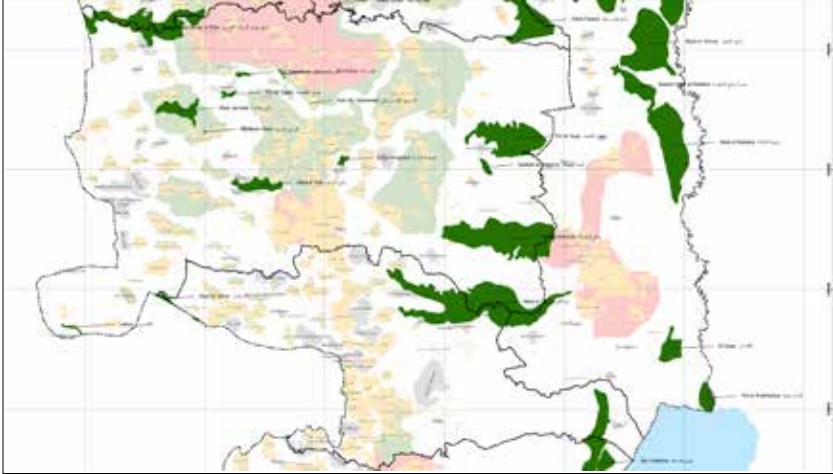


Figure 3: Proposed protected areas in Central West Bank (Council of Ministers, 2015).

Table 7. Proposed protected areas in Jerusalem Governorate (Council of Ministers, 2015).

Proposed name in English	Proposed name in Arabic	Name on original documents
Wadi el Qilt (Fig. 4)	وادي القلط	حزما (ناحال برات) وادي القلط
Marj ez Zarur	مرج الزعرور	بدون اسم



Figure 4: Wadi Al-Qilt.

Jericho Governorate: Nine protected areas have been listed in Jericho Governorate (Table 8, Figure 2 and 3). Wadi Al Qilt reserve is shared between Jericho and Jerusalem. All these proposed protected areas require baseline data on the floral and faunal compositions, as well descriptions for the ecosystems.

Table 8. Proposed protected areas in Jericho Governorate (Council of Ministers, 2015).

Proposed name in English	Proposed name in Arabic	Name on original documents
Ras Umm el Kharrub	محمية رأس ام الخروبة	No name assigned
Ein Bassat er Rih	محمية عين بصة الريح	No name assigned
Qarn Sartaba	محمية قرن صرطبه	No name assigned
Wadi Jauzala	محمية وادي جوزلة	No name assigned
Wadi el Ahmar	محمية وادي الاحمر	No name assigned
Bassat Wadi el Mallaha	محمية بصة وادي الملاحه	No name assigned
Wadi el Mallaha	محمية وادي الملاحه	No name assigned
El Katar	محمية الكتار	No name assigned
Tell er Rusheidiya	محمية الرشيدية	No name assigned

SOUTHERN WEST BANK

Bethlehem Governorate: Three protected areas were proposed by the Palestinian Ministerial Cabinet list (Table 9; Figure 5). All were not originally handed or proposed as stated by Garstecki *et al.* (2010). The status of what was previously known as Jerusalem Wilderness from the handed protected area after the Oslo Agreement remains to be clarified. This reserve is the largest protected area with estimated area of 172 km².

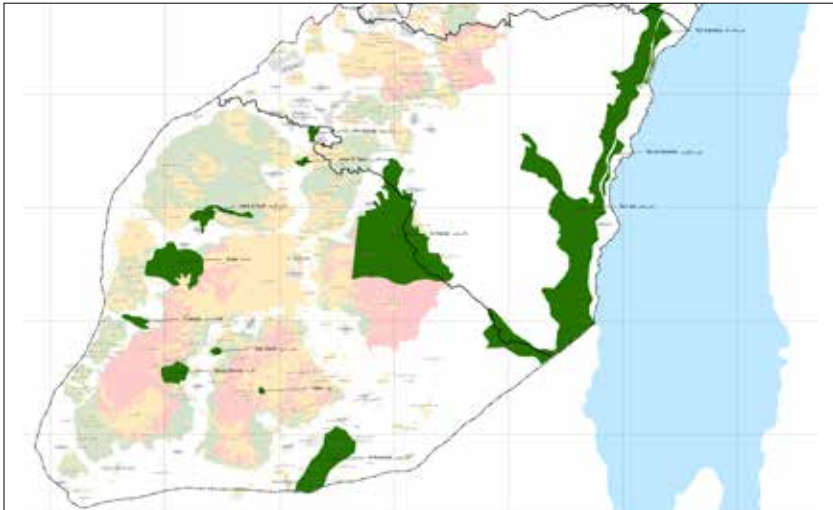


Figure 5. Proposed protected areas in Southern West Bank (Council of Ministers, 2015).

Table 9. Proposed protected areas in Bethlehem Governorate (Council of Ministers, 2015).

Proposed name in English	Proposed name in Arabic	Name on original documents
Ein Jidi	محمية عين جدي	عين الفشخة – تجمع عين جدي
Ein Fashkha	محمية عين فشخة	No name assigned
Ein el Ghuweir	محمية عين الغوير	No name assigned

Hebron Governorate: Ten protected areas were listed in the Palestinian Ministerial Cabinet list (Table 10; Figure 5). Al Qarin (=Jabel El Qarn), Wadi Al-Quff (=Wadi el Quff, Figure 6), Suba and Deir Razeh (=Deir Razih) reserves were proposed by Garstecki *et al.* (2010). Six newly proposed protected areas by the Palestinian Ministerial Cabinet (2015) include Abu Sauda, El Kanub, El Kuweiyis, Fuqeiqis, Karza (kurza) and Yatta.



Figure 6. Wadi Al-Quf.

POTENTIAL PROTECTED AREAS DEVELOPMENT AND CONSERVATION

The EQA designated 31 important biodiversity areas besides the ones listed above. Wadi Gaza in Gaza was designated a protected area in 2000 but for some reason was not included in the 49 areas listed above by the Council of Ministers (2015) and that would make for PA # 50. Israel has effectively shut off the water in the valley from its side of the border and the area is heavily pressured in terms of its environment with habitat destruction, pollution, and hunting. Another area is the very important area of Wadi Qana near

Salfit (Figure 7) which is effectively now surrounded by Israeli colonial settlements (preliminary unpublished studies show very rich biodiversity). Um Al Rihan Forest situated in Jenin District with an area of 11 km² has value both in natural and cultural heritage. Marj Sanoor and Wadi Al-Muquatta in Jenin area are also critical. The walls of Jerusalem which serve as shelter for a variety of birds including the threatened lesser kestrel, and the Jerusalem wilderness region, a semi-desert area are on the list of importance. Wadi Al Makhroun in Bethlehem and Wadi Haramya in Ramallah area are also important.

Table 10. Proposed protected areas in Hebron Governorate (Council of Ministers, 2015).

Proposed name in English	Proposed name in Arabic	Name on original documents
Abu Sauda	محمية أبو سؤدة	أبو سؤدة
Jabel El Qarn	محمية جبل القرن	القرن
El Kanub	محمية الكانوب	الكانوب
Wadi el Quff (Fig. 6)	محمية وادي القف	القف
Suba	محمية سوبا	غابة سوبا
Al Kuweiyis	محمية الكويس	حربة عين النبي (هار عمسة)
Fuqeiqis	محمية فقيقيس	No name assigned
Karza (kurza)	محمية كرزة	No name assigned
Yatta	محمية يطا	No name assigned
Deir Razih	محمية دير رازح	No name assigned



Figure 7. Wadi Qana PA.

PROTECTED AREAS CATEGORIES AND MANAGEMENT TYPE

The IUCN gave definitions, management categories and governance types for the protected areas and these guidelines should be followed in order to standardize the concept of protected areas worldwide. Garstecki *et al.* (2010) categorized the evaluated protected areas in the Palestinian Territories according to the IUCN categories for protected areas. Of the 22 evaluated protected areas, one was listed under category V as Protected Landscape, three under category III as natural monuments, four under category I as strict protected areas, and 14 under category IV as managed reserves (Table 11). Based on this IUCN categorization, the mosaic of natural and cultural landscapes around south-east of Jenin, including Shoubash and Um-Altutt, could potentially be designated as a UNESCO Biosphere Reserve (Garstecki *et al.*, 2010).

Table 11. Protected areas in the Palestinian Territories and their IUCN criteria.

Protected area	IUCN Criteria	Type
Al Qarin	I	Strict Nature Reserve
Al-Hashmee	I	Strict Nature Reserve
Deir Ammar	III or no PA at all	Natural Monument
Deir Razeh	IV	Managed Reserve
Ein Darra	IV	Managed Reserve
Ein El-Uja	IV	Managed Reserve
Fahmeh	IV	Managed Reserve
Jabal-Alkabeer	IV	Managed Reserve
Jerusalem Wilderness	IV	Managed Reserve
Sheikh Katrawny	III or no PA at all	Natural Monument
Sheikh Zeyd	III	Natural Monument
Shoubash	IV	Managed Reserve
Sirris	I	Strict Nature Reserve
Suba	I	Strict Nature Reserve
Tammoun	IV	Managed Reserve
Tayyasir	IV	Managed Reserve
Um Al-Saffa	IV	Managed Reserve
Um-Altutt	IV	Managed Reserve
Wadi Al-Dilb	IV	Managed Reserve
Wadi Al-Quff	V	Protected Landscape
Wadi El-Qilt	IV	Managed Reserve
Wadi Zarqa Al-Elwey	IV	Managed Reserve

Governmental authorities related to protected areas and Conservation

EQA as the legal successor of the Ministry of Environmental Affairs, and the MOA are the two main governmental bodies with legal authority designated to for nature protection, nature reserves, protected areas and national parks. However, it is not very clear which authority has the delegation over biodiversity and conservation, since both the Environmental Law for the year 1999 and the Agriculture Law for the year 2003 include articles related to nature protection.

The EQA has invested in the conservation of nature through their current activities and involvement in international conventions being the focal points of several initiatives. The EQA is responsible for the development of legislations, strategies and policies pertaining to environmental issues. In 2010, the EQA developed a three year strategy for 2011-2013 that identified and prioritized objectives for itself and for the Palestinian environment as a whole (EQA, 2010). EQA gave 48 specific objectives. Here are just some of those:

- Issuing legal and other directives
- Issuing information bulletins and statistical and other data information
- Building human capacity at EQA
- Documenting Israeli violations of the Palestinian Environment
- Founding of an environmental information center which issues regular reports
- Review and modernize the Palestinian Environmental Laws
- Review and evaluate institutional structures related to the environment

The structure of the EQA consists of the EQA President, a Vice President and six main administrative departments, each with a set of directorates. The General Directorate of Environmental Resources is the main body responsible for preparation of studies on biodiversity (Fauna and Flora), and cooperates in protecting designated areas. One important function of EQA is to monitor the NGO's related to environmental issues through the Law of Charitable Organizations and National Authorities for the year 2000.

Through the Agriculture Law for the year 2003, the Ministry is responsible for implementing Article 9 of section 1 of this Law that states: "*The Ministry in cooperation with other competent authorities shall develop a nature reserves management plan and conserve all plants and living organisms living in protected areas*". Two other laws are the Forest and Afforestation and the Rangelands Bylaws. A draft law for protected areas was prepared in 2005, however, it is still not approved yet. A national committee for nature protection would be formed under that law with membership from MoA, EQA, MOLG, MOT, MOL,

MOW, universities, local NGOs and persons with experience. In addition, this national committee has the authority to mandate the protected area issues to national organizations or authorities. The draft law also states *“The Ministry is the authorized authority for protecting targeted areas for the purpose of protection and includes nature reserves, protected areas, national parks and the natural heritage”*.

The Vice Minister of Natural resources of the MOA is responsible for three administrative units: General Directorate of Irrigation and Agricultural Water, General Directorate of Agricultural Land, and General Directorate of Forests, Rangelands and Wildlife. The latter Directorate is the main body responsible for managing nature reserves and protected areas. This directorate includes four divisions or departments: Forestry, Nature Reserves, Rangelands, and Nurseries.

LEGAL FRAMEWORK FOR PROTECTION

Jordanian laws on the environment were applied in the West Bank while the Egyptian laws applied in Gaza after the 1949 truce and until 1967. The Second Israeli Military Order designated immediately after the occupation in 1967 stated that all water resources in the newly occupied Palestinian Territories were to be “state owned by Israel” (UNEP, 2003). The PNA did attempt to legislate on issues of water and other natural resources via the water law signed by the late President Yasser Arafat on 17 July 2002. But these remain wishful thinking in context of continued occupation (UNEP, 2003).

The authority to issue laws was derived from signing Oslo agreements between the PLO and Israel which were supposed to be interim arrangements pending conclusions of negotiations on final status issues which include statehood, borders, security, refugees, and Jerusalem. As part of these agreements, the two parties agreed to protect the environment in compliance with International standards, conducts EIA, protect soil, and other natural resources etc. (UNEP, 2003). As early as January 1995, ARIJ and the Environmental Law Institute (Washington DC) drafted an environmental law for consideration by the nascent PNA (Amra, 1998). In 1995, the environmental planning directorate (EPD) was established within the Ministry of Planning and International Cooperation (MOPIC). In December 1996, the Palestinian Environment Authority was created and it was elevated to the Ministry of Environmental Affairs (MOEA) in 1998. A presidential decree in June 2002 created the Environmental Quality Authority (EQA) as a successor to the MOEA. The EQA mandate derives from the above mentioned law in addition to the national environment strategy (Amra, 1998).

In 1995-1996, the Ministry of Planning and International Cooperation developed an Emergency Natural Resources Protection Plan to counter

environmental concerns that will result from development of the newly established State. According to this plan, Gaza and the West Bank were divided into three regions according to their environmental sensitivity (high, medium and low). These regions were divided based on field studies for their importance in terms of biodiversity, nature reserves, water resources, agricultural land and landscape preservation (Amra, 1998). The aim of this plan was to direct all forms of development away from environmentally sensitive areas to the least sensitive areas.

Palestinian Environmental Law was approved by the PLC on 6th of June 1999 and signed by the Palestinian President on the 28th of December 1999. It consists of 82 articles. It states that the Palestinian National Authority (PNA) has the right and responsibility to study and assess any project for environmental impact and to protect the environment.

The EQA was given the task to "...prescribe bases and standards for the protection of natural reserves and national parks, monitor and declare them, and establish and designate the national parks and supervise them." Violations of the law theoretically would include penalties of fines and even imprisonment. But violations are common and we could not even find good examples of any successes in courts dealing with environmental law violations.

Besides the laws listed (especially the Palestinian Environmental Law), there are other laws relating to environmental issues that have indirect impacts on biodiversity: such as the Palestinian Local Government Law No. 1 of 1997, the Industrial Estates and Free Industrial Zones Law No. 10 of 1998, Natural Resources Law No. 1 of 1999, the Palestinian Water Law No. 3 of 2002, and the Protection of Animal Wealth Law No. 8 of 1998.

Agriculture Law No. 2 for the year 2003 is the legal reference for some aspects of protected areas or nature reserves. Article (1) of section (1) defines a protected area as: "*A geographically delineated area that is organized and managed for the purpose of its protection and to conserve its biodiversity*". Article (9) of section (1) of this Law states that: "*The Ministry in cooperation with other competent authorities shall develop nature reserves management plan and conserve all plants and living organisms living in protected areas*".

Finally, Palestine committed to obey international rules when it signed International agreements and conventions such as the Convention on Biological Diversity (CBD), the United Nations Convention to Combat Desertification (UNCCDE), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention on Migratory Species (CMS), the Convention to Combat Desertification (CCD), and the United Nations Framework Convention on Climate Change (UNFCCC). (Jaradat & Awad Allah, 2015).

DISCUSSION

Article 40 in Chapter 5 of the Palestinian Environmental Law of 1999 states that the Environmental Authority has the task to “prescribe bases and standards for the protection of natural reserves and national parks, monitor and declare them, and establish and designate the national parks and supervise them.” Violations of the law would include penalties of fine charges and imprisonment. Yet, as shown above, most of the protected areas are located within Area C where control continues to be under the exclusive authority of Israel. Further, 36.2% of the designated protected areas overlap with Israeli settlement “master plans” and 39.5% overlap with closed military areas and bases (Ghattas, 2008; EQA, 2015). There are many challenges that put stress the Palestinian environment and preclude appropriate protection ranging from rapid population growth, an impoverished economy, and an instable political situation. Collectively, this makes management of protected areas challenging.

Confiscation of land for settlements is one of the major threats to the Palestinian nature reserves. The confiscation of Ras Imweis and six adjacent areas, what is known as Nahal Shilo, located northwest of Ramallah is among the best examples for the Israeli practices of stealing Palestinian land. Previous cases of destruction and distortion of nature reserves in the occupied West Bank for the implementation of the various Israeli colonial projects is just an integral part of the Israeli practices. Israel exploited the term “Nature Reserve” for the sake of Israeli settlements. Such exploitation was obvious in Bethlehem Governorate, when Har Homa settlement was established in 1997 on Abu Ghneim Mountain, which was considered one of the largest forests in Bethlehem (POICA, 2013). Another report was published on the same context (Etkes & Ofran, 2007). It shows Israeli building of settlements in the Har Kabir reserve, and that Alonei Shilo and Elmatan outposts were built in the Nahal Kane reserve. Some Israeli settlements also dump toxic substances into the Palestinian environment including protected areas (Hammad & Qumsiyeh, 2013; EQA, 2015). As a result of these and other factors, some important areas have seen decline in biodiversity (e.g. Qumsiyeh *et al.*, 2014).

A challenge to the EQA and relevant agencies is that there are so few baseline studies on where the rich biodiversity areas are, and what they contain in the OPT. The Palestinian Authority designated Wadi Gaza as a nature reserve in Gaza containing 1.25 km² of a costal wetland only in June 2000 but it is an area of great promise with limited studies (Abed Rabou *et al.*, 2015). Wadi el-Far'a is an area of significant biodiversity stretching from Nablus to the Jordan Valley, including the ecotouristic sites like Badhan and also has significant potential (Abdulfattah & De Vries, 2006). The current work in this volume (see Qumsiyeh *et al.*, 2016) is the first detailed scientific study of just one of the 49 (potentially to go up to 51 or more with addition of Wadi Gaza and Wadi Qana among others).

A SWOT analysis for each of the 26 Palestinian protected areas was done by Garstecki *et al.* (2010). Table 12 provides an overall SWOT analysis for issues of protected areas and environmental conservation based on detailed analysis with more intensive work done in Wadi Quff and our current work on Wadi Zarqa Al-Ulwi and overall focus group study with stakeholders from all parts of the Palestinian areas.

Table 12. SWOT analysis (see also Alhirsh *et al.*, 2016)

Strengths	<ul style="list-style-type: none"> • More than 10% of the OPT can be actually protected areas • Rich biodiversity representative of many biomes. We have fragile but promising ecosystems. • 40 rangers available through Ministry of Agriculture. • Presence of legal framework laws pertaining to nature reserves. • Presence of national biodiversity strategy and action plan. • Presence of structured governmental organizations related to conservation and the environment. • Presence of several active NGOs in environmental issues. • High educational level and awareness among the local community in environmental issues. • Integration of environmental concepts in the Ministry of Education curricula. • Presence of research institutions concerned with biodiversity and the environment (e.g. Palestine Museum of Natural History).
Weaknesses	<ul style="list-style-type: none"> • Environmental Law (1999) is out of date and does not match with international agreements in terms of obligations on protected areas. • Little enforcement of existing laws. • The Agriculture Law is not comprehensive for nature reserves and their management. • Lack of coordination between the different authorities in the government and non-government sectors. • Limited knowledge: we need data on where biodiversity hotspots are, what areas to protect, and what is in them (scientific research). Lack of research on the protected areas (in terms of their delineation, status, and biodiversity). Only intensively studied one is Wadi Al-Quf and now some work on Wadi Zarqa Al-Ulwi. • Limited size of protected areas and presence near urban areas. • Protected areas mostly under Israeli control. • Increasing human pressures and habitat destruction. • Conflicts between some governmental stakeholders in who manages parks (MOA, EQA). • Significant deterioration in some areas may be irreversible. • Lack of proactive agendas.
Opportunities	<ul style="list-style-type: none"> • Presence of a trend in the Palestinian National Authority to regulate the environment as one active sector. • Presence of global and international attention and support to environmental issues with promising financial support. • The possibility of cooperation and coordination with governmental, NGOs and academic research institutions. • Presence of environmental conventions that guarantee the right of peoples under occupation to protect their environment. • Potentiality of developing ecotourism and natural park conservation awareness simultaneously. • Available knowledge bases could be mobilized (especially in academia). • Potentiality of small actions with limited budgets making huge impact on conservation but also potentially linked to poverty reduction (Adams <i>et al.</i>, 2004).
Threats	<ul style="list-style-type: none"> • Violations and destruction perpetrated by the Israeli occupation against the Palestinian environment. • Continued occupation/colonization and lack of sovereignty to act on urgent conservation issues including the lack of control over many of the environmental and natural resources due to administrative divisions of the occupied territories. • Global environmental problems such as climate change & desertification pollution etc. • Mismanagement of reserve areas (e.g. turning the reserve into a politically susceptible chip in local policy decisions) • Mobility and other obstructions to conservation programs under occupation. • Economic and social challenges. • The current political situation in the Palestinian territories.

RECOMMENDATIONS

- A comprehensive review and assessment of current environmental and agricultural laws is urgently needed to update and to resolve conservation issues. Revise and update Palestinian Environmental Law (1999) to create a stronger law in line with Palestine's obligations under international treaties signed and others potentially to sign. For example the current law lacks more detailed guidance on how the EQA should fulfill its obligations as stated mainly in Article (40) regarding the management of protected areas.
- Perform more detailed studies on human impact on the environment whether by Palestinians or Israeli settlers (see Tal, 2002; Ginsberg, 2006; Abdullah & Swaileh, 2011; Al-Haq, 2015; Qumsiyeh, 2017).
- Reform and strengthen governmental agencies especially in regard to enforcement of laws. Allocate resources for implementing laws and policies (no law or policy should be issued or revised without clear mechanisms of implementation) (see Esty & Porter, 2005).
- Review international agreements signed or potentially to sign in regards to implementation and obligations for Palestine. This included CBD, UNCCDE), CITES, CMS, CCD, and UNFCCC.
- There needs to be more vigorous and effective action by the EQA based on its mandate for example with regard to regulation of NGOs and regulation of industries based on solid EIAs and solid scientific data.
- There needs to be better coordination and consultation with academia especially to better utilize existing data and encourage collective acquisition of new.
- Palestine needs scientific data covering all areas of protected areas and potential protected areas by using the best available data collection methods on areas like geography, geology, hydrology, fauna, and flora. Such data can also help identify biodiversity hotspots for conservation priorities (Myers *et al.*, 2000).
- As a second step we need to develop management plans that use ecosystem approaches and take areas like social, cultural and economics into consideration (Slocombe, 1993; Adams *et al.*, 2004).
- Programs in EE in and around the protected areas need to be developed with a cohesive strategy that also helps creativity, innovation, and sustainability strategies. This includes comprehensive public engagement with the parks service resources to ensure communities benefit from protection of their natural resources.
- System wide participation addressing leaders and developing leaders who are able to take on tasks on protected area programs and strategies at a local regional and global scale.
- Increase awareness through marketing, education and cooperative associations which leads to increased interest, research, and protection.

- Due to limited resources, it is critical to identify hotspots and key species to direct resources for conservation (Myers *et al.*, 2000) and to use buffer zones around parks with local buy-in.
- The most critical is to solve the conflict between the MOA and the EQA and designate an authority responsible for managing protected areas effectively. There is talk of turning the first protected area properly studied, Wadi Al-Quf to the municipality of Hebron for management. This would be devastating to environmental issues. Local municipalities are subject to various pressures which cannot result in sustainable conservation efforts.

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