

- \_\_\_\_ (2016), *Protected Areas in the Occupied Palestine Territories*. Jordan Journal of Natural History, Special issue 1, Vol. 3, pp. 25-46.
- Qumsiyeh, M. B., Zavala, S. S. & Amr, Z. S. (2014), *Decline In Vertebrate Biodiversity In Bethlehem, Palestine*. Jordan Journal Of Biological Sciences, Vol. 7, pp. 101-107.
- Qumsiyeh, M. B., Handal, E. N. , Chang, J., Abualia, K., Najajreh, M., Abusarhan, M. A. (2017), *Role of museums and botanical gardens in ecosystem services in developing countries: Case study and outlook*. Intl J Env Studies, Vol. 74 , N.º 2, pp. 340-350.
- Roué, M. and Molnar, Z. (2017), *Knowing our lands and resources: Indigenous and local knowledge of biodiversity and ecosystem services in Europe and Central Asia*, Vol. 9. UNESCO Publishing.
- Roy, Sara and Pfeifer, Karen (Editors) (1999), *The Economics Of Middle East Peace: A Reassessment*, Jai Press.
- Sands, Philip (2003), *Principles of International Environmental Law*. Cambridge University Press, New York and London, second edition.
- Tal, A. (2002), *Pollution In A Promised Land: An Environmental History Of Israel*. University Of California Press.
- Vogel, D. (1997), *Trading Up and Governing Across: Transnational Governance And Environmental Protection*. Journal Of European Public Policy, Vol. 4, pp. 556-571.
- Weizman, Eitan (2012), *Hollow land: Israel's architecture of occupation*. Verso Books.
- Wilshusen, P. R. (2019), *Environmental governance in motion: Practices of assemblage and the political performativity of economic conservation*. World Development, Vol. 124, pp. 104-626.

# Impact of the Israeli Segregation and Annexation Wall on Palestinian Biodiversity

Duaa Husein\* e Mazin B. Qumsiyeh\*


pp. 19-26

## Introduction

The natural landscape includes ecological boundaries (ecozones, gradients, transition zones etc.) (Cadenasso *et al.*, 2003: 750). These boundaries reflect spatial heterogeneity and play an important role for the function and the structure of the ecosystem and biodiversity. During the domestication of plants in the Fertile Crescent some 12 million years ago (Kilian and Salamini, 2010: 137), human started building small terraces which increased during the Hellenistic period and especially during the Islamic period of the last 700 years. These terraces intended to maximize land for agriculture and to facilitate the preservation of the soil. (Ron, 1966: 33; Sayej, 1999: 201; Pastor, 2013: 1; Arnáez *et al.*, 2015: 122; Gadot *et al.*, 2016: 397). However, another class of boundaries are socio-political such as the political borders that rarely reflect geographic or ecological aspects (Dallimer and Strange, 2015: 132). This class, constructed not for ecological reasons, can affect the management of biodiversity and conservation because the borders can separate one contiguous ecosystem and impact its management (Dallimer and Strange, 2015: 132; Miller, 2020: 473).

The domestication of plants and animals in Palestine was followed by the formation of city states and then kingdoms and empires which this created shifting socio-political borders that also did not correspond to the geographic or ecological borders (Bar-Yosef, 1998: 159; Hatuka, 2012: 347). Cities like Bethlehem, Jerusalem, and Jericho also had built defensive walls around them. Yet, the city remained in direct contact and dependency on the rural areas that supplied food and other raw materials (Walmsley, 1996: 126).

During the human dominance established over the past few millennia (the Anthropocene), physical borders have indeed contributed to the global reduction in biodiversity (Tucker *et al.*, 2018: 466). We were thus interested in understanding effect of physical structures built for political purposes on biodiversity in Palestine. Israel's annexation and segregation wall built in the occupied Palestinian territories began in the 1990s in Gaza and in 2003 in the West Bank. It did have a negative impact on human and environmental health (EQA, 2010: 1; OCHA, 2022). Anecdotal data also suggest it has an impact on biodiversity (Abdallah & Swaileh, 2011: 543). Data on biodiversity shows a decline in the

 <https://doi.org/10.21747/0874-2375/af137a2>

\* The Biodiversity Center, Palestine Institute for Biodiversity and Sustainability, Bethlehem University, Bethlehem, Palestine.

West Bank caused by colonial activities (including walls) as well as other human activities (Qumsiyeh *et al.*, 2014: 101, and 2016: 6; Saeed and Qumsiyeh, 2020: 69; Salman *et al.*, 2014: 86; Handal *et al.*, 2020: 20; Amr *et al.*, 2016: 75).

## Methodology

This work is meta-analysis dependent on: **a)** literature review, **b)** author's own observations, **c)** the eight year experience of the Palestine Institute for Biodiversity and Sustainability at Bethlehem University (PIBS-BU see [Palestinenature.org](http://Palestinenature.org) especially annual reports and section on conservation and research) in examining biodiversity in Palestine in areas of the wall completed or partially completed. Our own studies at PIBS-BU accumulated mostly short-term observations and data on things like fauna and flora which were reported on in alpha level studies (e.g. PMNH, 2018; Qumsiyeh *et al.*, 2016: 6; Al-Sheikh and Qumsiyeh, 2021: 1).

## The Israeli Segregation and Annexation Wall

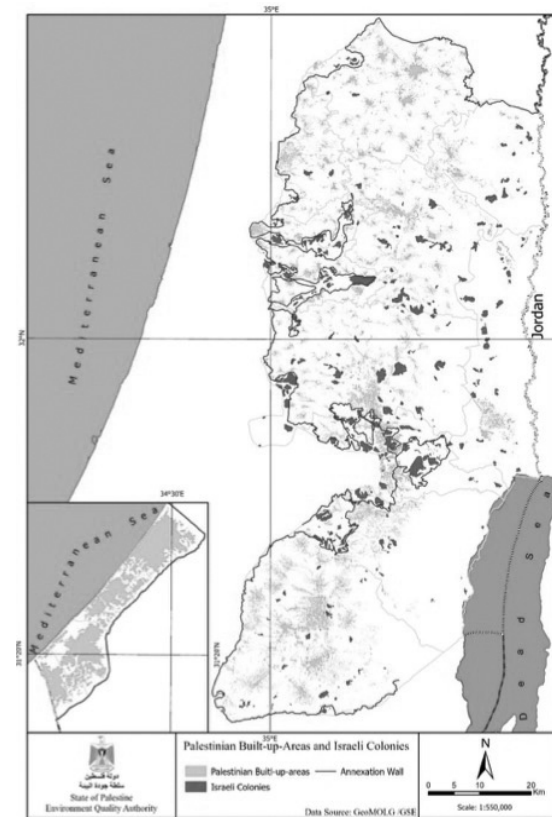
From its foundation as a Jewish state in a land that was multiethnic, multicultural and multireligious, Israeli policy makers believed in segregation and in the removal of natives enclosing them behind borders and walls. But walls were also used as a system of pressure to force the natives to leave. For example after the ethnic cleansing of 1948-1949, the nascent state of Israel wanted to remove the last remaining Palestinians in some areas. The villages of Faluja and Iraq Al-Manshiya were actually populated after the war and the withdrawal of Israeli army was predicated on allowing the natives to continue living there. But Israeli planners wanted them out so after setting the villagers in bordered villages (large prisons), they pressured them economically to finally “volunteer to leave”. Martial law was declared to other villages in the Galilee and the Negev (Qumsiyeh, 2004: 41).

Walls were set up around inhabitants of Gaza started in 1967 and accelerated as colonies were established in the Gaza strip. The Israeli partial withdrawal from the strip in 2005 eliminated some walls and added others. The Israeli planners hoped to get rid of the burden of internal policing of Gaza's population replacing it by external policing. At the same time, the plan was to intensify colonization in the West Bank. The plans for walls and fences in the West Bank started in 1993-1994 by the time the Oslo accords where Israel were supposed to give limited autonomy in Palestinians in urban areas (designated area A in the parlance of Oslo). Meanwhile there was an increasing colonization throughout the West Bank. Settler population mushroomed from in 1993 to over 600,000 by the year 2000 when all the delusions of Oslo “peace” accords evaporated (Qumsiyeh, 2004: 133).

The Outbreak of another uprising in 2000 gave the Israeli state the excuse to make more collective punishment and restrictions in both the West Bank and Gaza. The isolation of Jerusalem from its Palestinian suburbs intensified and the siege and blockade on Gaza became a hermetic seal that ensured impoverishment of nearly 2 million Palestinians. Having completed the wall around Gaza (with the aid of Egypt's dictatorships, in 2002, the Israeli government formalized its policy of segregation in the West Bank by starting massive building projects of segregation walls and barriers in the northern parts of the West Bank. The walls were billed “security barriers” in projections to Western Media but were not related to security. Evidence for this is very clear: **a)** there were Palestinians on

both sides of the wall (e.g. 250,000 Palestinians in Jerusalem on the “Israeli” side of the wall), **b)** there are Israelis on both sides of the wall with dozens of colonial Jewish settlements on the so called “Palestinian” side of the wall, **c)** suicide bombings had started in 1994 after the attack by a Jewish settler in the Ibrahimi mosque. The uprising and militant attacks ended in late 2005 when Hamas was convinced to enter elections. At that time the segregation walls were less than 30 % completed and yet continued while a public relations effort was built claiming the wall was meant for ending “terrorist attacks” (Qumsiyeh, 2012: 107).

The Wall cuts through the western part of the West Bank with a 721 km length, and a height of 8-12 meters - twice the height of the Berlin Wall. The Wall is composed of vehicle-barrier trenches, exclusion zones, electric fences and thick concrete slabs (ARIJ, 2015: 1). Most of the wall build is inside the West Bank well away from the green line and it is cutting more than 150 Palestinian communities from their lands and taking about 1/10<sup>th</sup> of the land mass of the West Bank to potentially annex it to Israel (part of it in Jerusalem was already annexed, EQA, 2010: 1; B'Tselem, 2017: 1). (Ilustração 01).



**Ilustração 01** – Map of the Israeli segregation and annexation wall (Courtesy of Environment Quality Authority).



Ilustração 02 – A section of the wall (Creative Commons).

### Impact of the wall on the environment and biodiversity

The impact on biodiversity and the environment includes:

1. Restriction on movement of land mammals. Our own studies on distribution of land mammals like the hyena (Handal *et al.*, 2020: 20) and gazelles (PIBS unpublished data) show a large reduction in population of these species (see also ecological data in Qumsiyeh 1996).
2. Land and soil degradation due to altered geophysical features (EQA, 2010: 1). Our own observations in areas like Wadi Zarqa (PMNH, 2018: 1) and Wadi Al-Makhrou (Qumsiyeh *et al.*, 2022) shows altered water courses which affect on natural habitats.
3. Habitat destruction and fragmentation. Already over 2 million trees were uprooted to build the wall, fences, associated roads and buffer zones (see stopthewall.org). The wall caused a fragmentation of the farms, forests, grasslands and water resources preventing access and use of lands and natural resources (ARIJ, 2015: 1; EQA, 2019: 1). Forests, Protected Areas and nature reserves were also disrupted by the wall construction. Almost 42 000 dunums of forests area were included in the wall area in addition to the annexation of forests and protected areas with high ecological value in west of the wall such as Umm Al Rayhan forest (EQA, 2010: 1).
4. Restructuring socioeconomics in environmentally damaging ways: farms segregated from land owners decreased local food production and added to unsustainable practices of consumption. The loss of lands and uprooting of many plants is damaging and endangering agro-biodiversity with high ecological and socio-economical value (ARIJ, 2005: 1). Many vegetables and crops are threatened to disappear especially the ones cultivated in plains and less rainfall areas (EQA, 2010: 1).

5. Overgrazing is a consequence of smaller areas allowed for people to access, which is causing depletion of plants and soil erosion (Abdallah & Swaileh, 2011: 543).
6. Impact on invasiveness and other species population changes: the wall likely explains local changes such as increased invasiveness of certain species and expansion of populations of animals like wild boars and hyrax while it decreases others like the gazelles (due to habitat changes). For large mammals like Hyenas, the wall impedes their movements in ways that reduces availability of food because they have large foraging areas (Handal *et al.*, 2020: 20). Spread of some invasive species that are not restricted by walls is noticeable such as the Indian myna bird (Handal and Qumsiyeh 2021: 129). A survey of areas around walls in Bethlehem Governorates showed many invasive species proliferating including *Ricinus communis*, *Ailanthus altissima*, *Nicotiana glauca*, and *Ambrosia confertiflora*.
7. The walls and the siphoning of spring water in many areas including those in this area has already produced a decline in Amphibian populations (Salman *et al.*, 2014: 86) and freshwater snails and plants (see also Al-Shaikh and Qumsiyeh, 2021: 6).
8. The restrictions on movement imposed on the Palestinian population via the walls and plant checkpoints impedes access of conservation crews (Amr *et al.*, 2016: 75; Qumsiyeh *et al.*, 2016: 6) and the imbalance of power endangers conservation efforts (Qumsiyeh and Albardeiya, 2022).

Loss of biodiversity can be attributed partly to these issues (Qumsiyeh *et al.*, 2014: 101, 2016: 6; Saeed and Qumsiyeh 2020: 69; Salman *et al.*, 2014: 86; Handal *et al.*, 2020: 20; Amr *et al.*, 2016: 75). Saeed and Qumsiyeh (2020: 69) also showed that going back to old travelers' books like those of Tristram can show significant negative changes in fauna like birds. A good example of a bird that was impacted by human activity is the Eagle Owl whose diet has significantly deteriorated from a very rich diet including hedgehogs, various birds and lizards to be dominated mostly by house rats (Amr *et al.*, 2016: 75). We did notice that climate change coupled with colonial activities do impact sensitive invertebrate species like land snails (Amr *et al.*, 2018: 25).

The actual damage to the environment goes beyond the construction aspect of the wall. Technically, in most of the areas except in the middle of urban areas like Eizariya in Jerusalem, the barrier is much more than simply a wall or a fence. It includes clearing large swaths of land around it in the form of "buffer zones".

### Discussion

Stonewalls used in agriculture can have a positive impact on biodiversity by supporting endemic flora and fauna, including providing refuge for seeds, for soil preservation, and for easy access to habitats (Collier, 2012: 141; Manenti, 2014: 1879; Assandri, 2018: 200). By contrast, socio-political barriers have a negative impact on biodiversity. This study and others (e.g. Fowler *et al.*, 2018: 137; Ogden, 2017: 498) demonstrate that border walls and other socio-political physical barriers do impact biodiversity and should be taken into account in planning conservation strategies (Dallimer and Strange, 2015: 132). Walls and barriers are not new in the world but the effect of barriers is now more visible because its extension and because it is also related to new phenomena like climate change. The border wall build between the USA and Mexico is similar to the separation wall inside the West Bank and clearly showed a impact for wildlife and people along the border (Best,

2021: 255; Fowler *et al.*, 2018: 137; Gladstone *et al.*, 2021: 18). By contrast, the Berlin wall (smaller in length and height) was in the middle of the city of Berlin and therefore did not impact so much the biodiversity. The impact on Palestine of such barriers is even worse due to its smaller geographical extension and to the much more convoluted route of the barriers in an area with diverse topography and five phytogeographic zones (see above). Conversely, removing borders and fences had shown positive impact on the ecosystems. In Europe: see for instance what happened after the removal of the European borders and the restoration of an open landscape had helped biodiversity (Ogden, 2017: 498). The importance of open landscapes in natural resources management and conservation cannot be overstated.

The colonial Zionist project to this day refuses to define the borders of its ambitions or even its state. Its ambitions can range from the area of the “Nile to the Euphrates” to the southern Levant plans proposed at the 1919 Paris Peace Conference (that includes Palestine, Jordan, and parts of Syria and Lebanon), to the area west of the rift valley plus the Golan Heights (annexed Syrian territory). But the physical alteration of the landscape here has been clearly devastating to the environment. For the native Palestinians, challenging walls as forms of oppression joins the struggles of oppressed communities and is critical to sustainability in a healthy environment (Harsha 2012; Quintanilla and Moganam, 2015: 1039; Salem, 2019: 149; Masri, 2021: 85).

## Acknowledgements

The work done at the Biodiversity Center established via a grant from the European Union Peacebuilding Initiative titled “Unity and Diversity in Nature and Society” (ENI/2019/162124/83). Funders are not responsible for contents of the work. We thank an anonymous reviewer for comments and edits.

## Bibliographic references

- Abdallah, T. and Swaileh, K. (2011), *Effects of the Israeli Segregation Wall on biodiversity and environmental sustainable development in the West Bank, Palestine*. International journal of environmental studies, Vol. 68, N.º 4, pp. 543-555.
- Al-Sheikh, B. and Qumsiyeh, M. B. (2021), *Imperiled ecosystems in Palestine: Rare plants as Indicators*, pp. 1-7. In Dominic DiPaolo & John Villella Imperiled: The Encyclopedia of Conservation”, Reference Module in Earth Systems and Environmental Sciences, Elsevier.
- Amr, Z. S., Najajreh, M. H., Zawahreh, M., Neubert, E., Handal, E. N., Abu Baker, M. A., & Qumsiyeh, M. B. (2018), *Diversity and Ecology of the land snails of the Occupied Palestinian Territories*. Zoology and Ecology, Vol. 28, N.º 1, pp. 25-35.
- Amr, Z. S., Handal, E. N., Bibi, F., Najajreh, M. H. and Qumsiyeh, M. B. (2016), *Change of diet of the Eurasian Eagle Owl, Bubo bubo, suggest decline in biodiversity in Wadi Al Makhrou, Bethlehem Governorate, Palestinian Territories*. Slovak Raptor Journal, Vol. 10, pp. 75-79.
- ARIJ (2015), *The Segregation Wall impacts on Palestinian Environment*. The Applied Research Institute – Jerusalem (ARIJ). Bethlehem, West Bank, Palestine.
- Arnáez, J., Lana-Renault, N., Lasanta, T., Ruiz-Flaño, P. and Castroviejo, J. (2015), *Effects of farming terraces on hydrological and geomorphological processes. A review*. Catena, Vol. 128, pp. 122-134.

- Assandri, G., Bogliani, G., Pedrini, P. and Brambilla, M. (2018), *Beautiful agricultural landscapes promote cultural ecosystem services and biodiversity conservation*. Agriculture, Ecosystems & Environment, Vol. 256, pp. 200-210.
- B'Tselem (2017), *The Separation Barrier*. [Online]. [Consult. 21.March.2022]. Available at: [https://www.btselem.org/separation\\_barrier](https://www.btselem.org/separation_barrier).
- Bar-Yosef, O. (1998), *The Natufian culture in the Levant, threshold to the origins of agriculture*. Evolutionary Anthropology: Issues, News, and Reviews, Vol. 6, N.º 5, pp. 159-177.
- Best, S. (2021), *The Costs of a Wall: The Impact of Pseudo-Security Policies on Communities, Wildlife, and Ecosystems on the US-Mexico Border*. In Like an Animal: Critical Animal Studies Approaches to Borders, Displacement, and Othering, pp. 255-280. Brill.
- Cadenasso, M. L., Pickett, S. T., Weathers, K. C. and Jones, C. G. (2003), *A framework for a theory of ecological boundaries*. BioScience, Vol. 53, N.º 8, pp. 750-758.
- Collier, M. J. (2013), *Field boundary stone walls as examples of 'novel' ecosystems*. Landscape Research, Vol. 38, N.º 1, pp. 141-150.
- Dallimer, M. and Strange, N. (2015), *Why socio-political borders and boundaries matter in conservation*. Trends in Ecology & Evolution, Vol. 30, N.º 3, pp. 132-139.
- Environment Quality Authority (EQA) (2010), *The impact of annexation and expansion wall on the Palestinian environment*. Ramallah, Palestine.
- Fowler, N., Keitt, T., Schmidt, O., Terry, M. and Trout, K. (2018), *Border wall: bad for biodiversity*. Frontiers in Ecology and the Environment, Vol. 16, N.º 3, pp. 137-138.
- Gadot, Y., Davidovich, U., Avni, G., Avni, Y., Piasetzky, M., Faershtein, G., Golan, D. and Porat, N. (2016) *The formation of a Mediterranean terraced landscape: Mount Eitan, Judean Highlands, Israel*. Journal of Archaeological Science: Reports, Vol. 6, pp. 397-417.
- Gladstone, F., Liverman, D., Rodríguez, R.A.S. and Santos, A. E. M. (2021), *NAFTA and environment after 25 years: A retrospective analysis of the US-Mexico border*. Environmental Science & Policy, Vol. 119, pp. 18-33.
- Handal, E. N. and Qumsiyeh, M. B. (2021), *Status and Distribution of the invasive Myna Acridotheres tristis (Linnaeus, 1766) in the Occupied Palestinian Territories (West Bank)*. Sandgrouse, Vol. 43, pp. 129-132.
- Handal, E. N., Qumsieh, G. H., Hammash, Shayma Y. and Qumsiyeh, M. B. (2020), *Status and Conservation of the Striped Hyena (Hyaena hyaena) in the Occupied Palestinian territories (West Bank)*. Jordan Journal of Natural History 6, pp. 11-18.
- Hatuka, T. (2012), *Civilian consciousness of the mutable nature of borders: The power of appearance along a fragmented border in Israel/Palestine*. Political Geography, Vol. 31, N.º 6, pp. 347-357.
- Kilian, B., Martin, W. and Salamini, F. (2010), *Genetic diversity, evolution and domestication of wheat and barley in the Fertile Crescent*. In Evolution in Action, pp. 137-166. Springer, Berlin, Heidelberg.
- Manenti, R. (2014), *Dry stone walls favour biodiversity: a case-study from the Apennines*. Biodiversity and conservation, Vol. 23, N.º 8, pp. 1879-1893.
- Masri, H. (2021), *'From Palestine to Mexico, all the walls have got to go': rhetorical bordering as transnational settler colonial project*. Communication and Critical/Cultural Studies, Vol. 18, N.º 1, pp. 85-93.

- Miller, M.A. (2020), *B/ordering the environmental commons*. Progress in Human Geography, vol. 44, N.º 3, pp. 473-491.
- OCHA (2022), *Barrier and access restriction map*. [Online]. [Consult. 21.March.2022]. Available at: <https://www.ochaopt.org/content/west-bank-access-restrictions-june-2020>.
- Ogden, L. E. (2017), *Border Walls and Biodiversity: New barriers, new horizons*. BioScience, Vol. 67, N.º 6, pp. 498-505.
- Pastor, J. (2013), *Land and economy in ancient Palestine*. Routledge, New York.
- PMNH - Palestine Museum of Natural History (2018), *Actions for Environmental Sustainability in Wadi Zarqa Protected Area*. UNDP-GEF-SGP
- Quintanilla, L. and Mogannam, J. (2015), *Borders Are Obsolete: Relations beyond the "Borderlands" of Palestine and US-Mexico*. American Quarterly, Vol. 67, N.º 4, pp. 1039-1046.
- Qumsiyeh, M. B. (2012), *Popular Resistance in Palestine: A History of Hope and Empowerment*. Pluto Press, London.
- \_\_\_\_\_. (2004), *Sharing the Land of Canaan: Human Rights and the Israeli-Palestinian Struggle*. Pluto Press, London.
- \_\_\_\_\_. (1996). *Mammals of the Holy Land*, Texas Tech Press, 1996. ISBN 9780896723641.
- Qumsiyeh, M. B. and Albardeiya, I. M. (2022), *Politics, powers, and the environment in Palestine*. Africana Studia (this issue).
- Qumsiyeh, M. B., Khalilieh, A., Albardeiya, I. M. and Al-Shaikh, B. (2016), *Biodiversity Conservation of Wadi Al-Quff Protected Area: Challenges And Opportunities*. Jordan Journal of Natural History, Special issue 1, Vol. 3, pp. 6-24.
- Qumsiyeh, M. B., Zavala, S., and Amr, Z. S. (2014), *Decline in Vertebrate biodiversity in Bethlehem, Palestine*. Jordan Journal of Biological Sciences, Vol. 7, N.º 2, pp. 101-107.
- Ron, Z. (1966), *Agricultural terraces in the Judean Mountains*. Israel Exploration Journal, Vol. 16, N.º 1, pp. 33-49.
- Saeed, R. and Qumsiyeh, M. B. (2020), *Are 19th century studies relevant to understanding changes in raptor bird fauna in the Fertile Crescent? An example from Tristram's work*. Sandgrouse. Journal of the Ornithological Society of the Middle East, Vol. 42, pp. 69-77.
- Salem, H. S. (2019), *No sustainable development in the lack of environmental justice*. Environmental Justice, Vol. 12, N.º 3, pp. 140-157.
- Sayej, G. (1999), *The origin of terraces in the central hills of Palestine: theories and explanations*. The Landscape of Palestine: Equivocal Poetry, pp. 201-210.
- Salman, I., Salsaa', M. and Qumsiyeh, M. B. (2014), *Distribution and Cytogenetics of Amphibians from the occupied Palestinian territories (West Bank of Jordan)*. Jordan Journal of Natural History, Vol. 1, N.º 1, pp. 86-98.
- Tucker, M. A., Böhning-Gaese, K., Fagan, W. F., Fryxell, J. M., Van Moorter, B., Alberts, S. C., Ali, A. H., Allen, A. M., Attias, N., Avgar, T. and Bartlam-Brooks, H. (2018), *Moving in the Anthropocene: Global reductions in terrestrial mammalian movements*. Science, Vol. 359, N.º 6374, pp. 466-469.
- Walmsley, A. (1996), *Byzantine Palestine and Arabia: urban prosperity in late antiquity*. Towns in transition: urban evolution in late antiquity and the early Middle Ages, p. 126.

## The exploitation of natural resources in Area C of the West Bank as indicator of annexation

María Fernanda Cáceres Sánchez\*


pp. 27-47

According to the international community, the Occupied Palestinian Territory (OPT) refers to the territories occupied by Israel as of 1967, i.e. the West Bank (including East Jerusalem) and the Gaza Strip, two non-contiguous areas but considered as one territorial unit under Israeli occupation (see Ilustração 01) (Power, 2015: 8).



Ilustração 01 – Occupied Palestinian Territory.  
Source: OCHA, 2022.

The Oslo Accords concluded between Israel and the Palestine Liberation Organization between 1993 and 1995 divided the West Bank into Areas A, B, and C, shown on the map below (Ilustração 02). The first area refers to the parts under Palestinian civil and security

 <https://doi.org/10.21747/0874-2375/af37a3>

\* Palestine Institute for Biodiversity and Sustainability, Bethlehem University, Palestine.