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**Conservation Across
a Middle East Conflict Zone** CellPress

Science & Society 'Nature Knows No Boundaries': The Role of Nature Conservation in Peacebuilding

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Humanity is facing a biodiversity crisis. To solve environmental problems, we bring people from Israel, Jordan, and the Palestinian Authority to the same table. Conservation efforts are beneficial for all communities and facilitate constructive dialog across divides in conflict zones. This pleads for the integration of nature conservation into peacebuilding interventions.

Nature Conservation As a Tool for Peace

Nature is sometimes a source of conflicts [1], but more often suffers as a result of them [2]. Although in some instances warfare might benefit wildlife by depopulating wilderness areas and reducing resource exploitation, conflicts are usually harmful to ecosystems [3]. The destruction of natural resources can be deliberately used as a weapon, illustrating the vicious circle of armed conflicts: natural resources can be the source of conflict and conflicts can destroy these resources [4].

The road to the first dialog between war opponents is long and full of challenges, requiring interactions at all levels of society. Resolutions signed by politicians might have little effect if citizens are not prepared for peace and politicians of

countries in conflict may engage in peace negotiations if their citizens have already started to reconstruct dialog [5]. The importance of cross-border interactions between civil societies in the resolution of conflicts has been demonstrated on numerous occasions [6]. This is a first step towards building trust, which can be difficult to achieve through official political channels. Nature conservation can provide an incentive for joint cooperative actions between communities (Box 1) [4,6,7]. This approach, while promising, presents challenges in bringing people from communities experiencing a conflict to the same table [6,8].

Because nature knows no sociopolitical boundaries, conservation measures cannot be implemented without considering the human component and societal issues across political or religious divides [9]. By promoting dialog between communities, ecosystems shared by multiple countries can be reconnected, favoring both nature conservation and peacebuilding [10]. We stress that recognizing the role of nature conservation in the reconciliation between communities in conflict has the potential to inspire more conservation efforts around the world, particularly in societies not yet involved in nature conservation.

Ecology and Conservation in a Major Conflict Zone: Cross-Border Projects in the Middle East

Our goal here is to show the important role that nature conservation can play

in reconciling communities in conflict. Nature conservation is an ideal platform for dialog because it can bridge culture, tradition, and religious divides. Hence, it has the potential to consolidate friendship and mutual trust between the communities without the need to bring forth the sensitive issues that are at the root of the conflict. Nature conservation is also of interest because communities across a conflict divide share the same interest in preserving ecosystems [4]. Although working at the international level is often beyond the reach of practitioners on the ground, conservationists working on environmental issues in multiple countries have to work at three levels: local, national, and international. (i) At the local scale, the rationale is to favor a bottom-up approach where people from both sides of a border initiate nature conservation programs. (ii) To be locally successful, national leaders need to support and invest financial and human resources to promote human contacts emanating from nature conservation projects. (iii) The international community needs a common-ground platform to act as a referee between communities in war, and nature conservation offers this platform. This new perspective can be the starting point of new peace initiatives that would help resolve deadlock situations. We describe the three key levels, as well as the challenges (Table 1), of a project we developed in the Middle East (Israel, Jordan, and the Palestinian Authority), a region of intense conflict.

Box 1. Bottom-Up Peacebuilding

Placing local grassroots actors at the center of peacebuilding processes presents a promising and complementary approach to top-down elite governance [21]. Bottom-up peacebuilding aspires to be more sustainable than institutional peace-making, because it favors coexistence based on cooperative interactions and is not motivated by short-term political consideration and underlying agendas [22]. Initiatives from civil society have the power to unite people from both sides of a border around a universal issue shared by all parties spanning beyond the conflict, culture, tradition, and religion. For instance, climate change and other anthropogenic global environmental changes are threatening ecosystems worldwide and are hence a concern for all regardless of historical backgrounds. Other themes and issues have successfully united civil societies, including business, women's rights, sport, and art [23]. This pragmatic approach promotes bridging between parties and the identification of shared challenges addressable through cooperation [24,25]. This approach has the potential to maximize the number of people that can appreciate the benefits of cross-border, people-to-people contacts.

Table 1. Joint Projects on Peacebuilding and Nature Conservation: Challenges and Keys to Success in the Specific Projects Occurring between Israel, Jordan, and the Palestinian Authority

Challenges and costs	Key elements of success
<p>Different priorities for each community</p> <ul style="list-style-type: none"> • Dealing with different goals and priorities for different actors. • Nature conservation issues are not a priority when basic human needs are not fulfilled. • Big gaps in the ability of undeveloped countries to be partners at the required academic level. 	<p>Win-win activity</p> <ul style="list-style-type: none"> • Be pragmatic; define short-term and long-term goals focusing on direct opportunities for mutual gains. • Funds for nature conservation projects should be coupled with humanitarian funds. • Academic assistance from Western countries is necessary.
<p>Logistical problems</p> <ul style="list-style-type: none"> • Working with different communities in conflict generates transaction and logistical costs (communication, language barriers, travel) and delays of action. • Difficult for local actors to cross borders and obtain visas for international meetings (travel permits not issued), which prevents them meeting and receiving training and makes stakeholders feel unequal and untrusted. 	<p>Diverse pathways for social and knowledge exchange</p> <ul style="list-style-type: none"> • Harness internet technologies to facilitate training and data exchange. Importance of funding to provide internet access to stakeholders and permit travel. • Simplify border procedures and reduce the cost of visas for people having to cross a border to meet their colleagues on the other side of the border.
<p>Trust issues</p> <ul style="list-style-type: none"> • People can boycott transborder projects initiated by people from the other side of the border. • People involved in cross-border projects may have the impression that their actions are not taken into account. • People involved in cross-border projects may be considered traitors. 	<p>Third (neutral) actors</p> <ul style="list-style-type: none"> • Importance of regular meetings and human contact to build sustainable relationships. • Third (neutral) actors can organize and moderate joint seminars between communities in the Middle East or in a neutral country with no hidden agenda and be perceived as trustworthy peacemakers. • Avoid unnecessary publicity about joint actions (e.g., seminars), ensuring full anonymity of all parties involved.
<p>Local versus global</p> <ul style="list-style-type: none"> • Even if stakeholders cooperate at the local level, they might not believe it will help peace as long as underlying problems at broader scales are unresolved. 	<p>Promoting spillover</p> <ul style="list-style-type: none"> • Importance of project visibility, to advertise the success of cooperation and promote lasting change in public opinion. Harnessing multiple modes of interaction: local and political.
<p>Asymmetries</p> <ul style="list-style-type: none"> • Disparity and inequality between communities in resources and ability to generate data and apply policy leads to distrust between partners. 	<p>Financial support</p> <ul style="list-style-type: none"> • Fund capacity-building initiatives and promote the exchange of data and technology with partners with the greatest needs to help them become independent in data collection and project management.
<p>Cheaters</p> <ul style="list-style-type: none"> • Opportunistic actors might use environmental issues and cross-border cooperation to obtain international financial support. 	<p>Transparency</p> <ul style="list-style-type: none"> • Grants should be divided between the different communities and third (neutral) actors should monitor projects to determine that funds are used correctly.
<p>Impact assessment</p> <ul style="list-style-type: none"> • Difficulty in assessing long-term project impacts, particularly the sustainability of durable cooperation and the larger effect on peacebuilding. This is particularly difficult because the impact is on the long term (building trust takes time). 	<p>Long-term commitment</p> <ul style="list-style-type: none"> • Long-term and short-term objectives are crucial in implementing the project. Scientific expertise helps to ensure the realism and sustainability of conservation projects and to follow the impact on the ground.

As in many other regions on Earth, environmental issues are far reaching in the Middle East: water is rare, animals are over-hunted, and poison is used extensively to eradicate small mammals and many other animals [11]. Because these problems extend beyond political borders

in the region, their resolution requires cross-country initiatives applied at a large geographic scale. The projects promote people-to-people activities between members of the Israeli, Jordanian, and Palestinian communities, by means of science.

Local: Build the Dialog – Bottom-Up Conflict Transformation

Cooperation projects across conflict zones should have a firm local rooting and be beneficial within each country. This is necessary for cross-border interactions to be credible, if the ultimate aim is

to build confidence between communities in conflict and improve intergroup relations [12]. By working together on a common, politically neutral goal, actors can change their vision of the neighboring cross-border community [13] and strengthen common regional identities.

In the Middle East, the essence of the project 'Birds Know No Boundaries' is threefold: (i) to convince individuals and communities to protect their environment in their own country; (ii) to favor communication between countries to foster experience; and (iii) to use the project to raise awareness about environmental and peacebuilding issues. The intensive use of agricultural pesticides throughout the Middle East poses a grave threat to the environment and its biological diversity. The Jordan Valley, located at the junction of Europe, Asia, and Africa, is an important diversity hotspot and is an important bottleneck on the world's principle bird migration routes [14]. To protect birds migrating from Europe and Asia from poisoning, we developed a project to replace pesticides with biological pest control agents in agricultural fields. Israeli,

Jordanian, and Palestinian farmers participate in this joint integrative pest management project with the ultimate aim of promoting more sustainable and environmentally friendly farming habits. Barn owls (*Tyto alba*) and kestrels (*Falco tinnunculus*) are common throughout Israel, Jordan, and the Palestinian Authority, especially in agricultural areas. Each pair of barn owls produces up to 11 offspring, which eat between 2000 and 6000 rodents per year, making them an efficient alternative to pesticides for the farmers. As both species make their nests in cavities, either natural or manmade, they constitute perfect candidates for populating the nest boxes specifically erected for this purpose [15] – 3000 in Israel and 220 each in Jordan and the Palestinian Authority. Demonstrating the success of this project, farmers decreased the spread of pesticides without compromising crop production, the barn owl population size increased, and, since 2002, Israelis, Jordanians, and Palestinians regularly exchange experience during joint seminars (Figure 1). The project has continued without a break, even during the periods of conflict in the region. A central

component of the project is ecological education for farmers and their children, with documents prepared for the Jewish and Arabic communities in Hebrew and Arabic (Figure 2A). The study of owls raises public awareness about ecology and the interconnectivity between world regions. Because barn owls know no boundaries, owls breeding in Israel hunt rodents not only in this country but also in Jordan and the Palestinian Authority (Figure 2B), the reverse also being true with owls from the Palestinian Authority or Jordan hunting in Israel. Another symbol of interconnectivity is the finding of mixed couples comprising one owl born in Israel and another born in Jordan (Figure 2C).

Nature conservation projects can also be integrated with popular leisure and sport activities. During the so-called 'Crane Race', groups of runners from Israel, Jordan, and the Palestinian Authority run around Agamon Hula Lake. Because 35 000 common cranes (*Grus grus*) winter there, this leisure project raises awareness about nature while promoting cooperation between the different communities. Conservation and art can be also a source of inspiration to protect the environment. In 2017 artists from the region and worldwide will come together to paint the Dead Sea region to raise awareness of the importance of protecting this unique habitat and its wildlife.

National: Consolidating the Dialog – Top-Down Conflict Transformation

Local actors participating in cross-border cooperation projects need to unite high-profile partners to promote impact. The spirit of a project, and of its initiators, is decisive in convincing politicians and decision-makers to finance and develop new projects. National leaders are particularly sensitive to economically sustainable concepts, such as ecotourism, that increase regional reputation and give opportunities to build new contacts with neighboring countries. That local and



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Figure 1. Jordanian Farmer Holding a Barn Owl, Which Was Once Considered a Bad Omen. Behind him, an Israeli farmer next to a nest box. © Hagai Aharon.



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Figure 2. Barn Owls Know No Boundaries. (A) Posters explaining the ecological importance of owls to the Jewish and Arab communities. (B) Using a GPS transmitter, we could show that a barn owl pair was breeding in Israel while mainly hunting in the Palestinian Authority. © Motti Charter. (C) A breeding pair of barn owls, one hatched in Israel and the other in Jordan. The nest box is located in Israel; behind, the Jordanian hills. © Motti Charter.

national projects permit the building of a strong web of relationships among local partners, schools, and farmers from the different regions involved is likely to galvanize further interest. By integrating the needs of national leaders, scientists can substantially increase the impact of cooperation around nature conservation. The involvement of governmental interest can favor the long-lasting success of joint projects between nature conservation and peacebuilding [16].

In the Middle East, local cooperation around nature conservation projects started to interest politicians and other members of society, including those interested in peace processes, such as the late Honorable Shimon Peres (Figure 3A). The 1994 Peace Treaty between Israel and Jordan was instrumental in this respect. It resulted in several cross-

border environmental projects aimed at creating shared opportunity for ecotourism and the promotion of natural heritage across territories. This includes the Red Sea Marine Peace Park between Israel and Jordan, which promotes cooperation between the countries to protect the

transboundary coral reefs [17]. In this context, generals from Jordan (Mansour Abu Rashid) and Israel (Baruch Spiegel) who participated in the peace negotiations (Figure 3B) realized the power of nature for peacebuilding (Box 2) and became strong advocates of nature conservation. While

Box 2. The Wolf Story: Cooperation on Nature Projects As First Sign of Mutual Trust

The Israeli General Baruch Spiegel and the Jordanian General Mansour Abu Rashid recall an anecdote that was decisive in the Peace Treaty between Israel and Jordan. General Baruch Spiegel studied biology and was an adept of natural history. Before the Peace Treaty with Jordan, Israeli researchers tracking wolves with radiocollars lost track of an individual that crossed the Jordanian border in 1993. Bedouins killed the wolf and handed the radio collar to Jordanian soldiers, which was subsequently sent to the Intelligence service in Amman over spying concerns. General Baruch Spiegel, who was at the time in close contact with General Mansour Abu Rashid to discuss peace, requested back the collar for scientific purposes. In Jordan the Intelligence service suspected that the collar was used for spying purposes and General Abu Rashid had to convince his colleagues to give it back, in which finally he succeeded. General Spiegel received the collar, in addition to another collar they had lost years ago. General Spiegel reported the incident of the two collars to Prime Minister Yitzhak Rabin. Prime Minister Rabin was moved, as the 'collar story' was a signal of possible cooperation and trust. He told General Baruch Spiegel to pursue harder than ever the effort to reach a peace agreement with Jordan. He predicted that peace would be signed in 1 year. However, it was signed just 8 months later. The wolf story was decisive in reaching this peace resolution, serving as a testament to how nature conservation can bring people together.



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Figure 3. Uniting High-Profile Partners to Consolidate Dialog between Communities. (A) The late Honorable Shimon Peres, winner of the Nobel Peace Prize in 1994 shared with the late Yitzhak Rabin and Yasser Arafat, holding a barn owl with Yossi Leshem (courtesy of Hagai Aharon). (B) The Jordanian General Mansour Abu Rashid (extreme left) and the Israeli General Baruch Spiegel (in green) bringing the Peace Treaty between Israel and Jordan to the late Israeli Prime Minister Yitzhak Rabin and the late His Majesty King Hussein with the US President Bill Clinton and the late Israeli President Ezer Weitzmann. (C) The Jordanian General Mansour Abu Rashid talking at the Knesset (Israeli parliament) about how nature conservation can reconcile people at war. Mutual interest in nature conservation facilitated his presence, one of the rare instances of a Jordanian talking at the Knesset (courtesy of Amir Ezer). (D) Alexandre Roulin offering a painting of a bearded vulture (*Gypaetus barbatus*; in Hebrew, *peres* means 'bearded vulture') to the late honorable Shimon Peres as a symbol of the reintroduction of this species in the Middle East after it disappeared in 1982; General Mansour Abu Rashid is sitting. (E) Contact with members of the Swiss Army; from left to right, Alexandre Roulin, General Mansour Abu Rashid, Yossi Leshem, and former chief of staff of the Swiss Army Lieutenant General Christophe Keckeis.

military forces are at the front line of conflicts, they can also play central roles in peacebuilding and can help motivate societies to take responsibility for their environment. Nature around the border of a conflict divide offers the possibility of promoting collaboration between different armies. This is a highly symbolic undertaking and we successfully convinced the Israeli and Jordanian armies, which were previously fighting against each other, to promote nature protection. An example of cooperation following the Israel–Jordan Peace Treaty is the preservation of many bunkers abandoned along the border, which provide a suitable habitat for

twelve species of bats, some rare and endangered (such as the trident bat *Asellia tridens*, Geoffroy's horseshoe bat *Rhinolophus clivosus*, and the Egyptian mouse-tailed bat *Rhinopoma cystops*). Today the Israeli and Jordanian armies are working hand in hand to conserve the bats by adding bat-gripping areas to the ceilings.

Despite its immense cultural and natural richness, the Middle East is often not the first destination of tourists. Decision-makers are thus interested in initiatives promoting alternative images of the region. To promote ecotourism a network

of 15 birding centers has been deployed throughout Israel, enabling teachers to receive professional guidance in ecology and natural history. The ultimate aim is to create similar centers in Jordan and the Palestinian Authority to offer tourists the possibility of enjoying nature across the three regions. Tourism can serve as a tool to connect local people and help sustain sites of international importance. In the Hula Valley, the 35 000 wintering common cranes are fed 7 tons of corn daily to keep them from damaging the crops in the surrounding agricultural fields [18]. About half a million people visit this site each year from October to March,

channeling an income of US\$25 million annually to surrounding villages. Similar projects should be developed in Jordan and other countries in the Middle East where many marshes have been dried out.

International: From Cooperation to Peacebuilding

A proposition emanating from one side of the border can be viewed as an intolerable intrusion by people from the other side of the border, although local cooperation can be built and attitudes towards other groups can evolve [19]. The involvement of third parties as peacemakers, such as neutral countries, international NGOs, or institutions, can play an important role in this process [20]. They can help to organize international support, raise funds, and increase the prestige of local projects. It is therefore of critical importance to advertise internationally the success of cooperation between countries in conflict around nature conservation projects to promote the spread of new initiatives. Because of a shared concern for both environmental and peacebuilding beyond political divides, they can harness the support of international leaders [19].

The cooperation of local stakeholders through conservation projects can stimulate cooperation among politicians for conflict resolution [5] (Figure 3C), which the international community should support and raise awareness of. We started to advertise the projects performed in the Middle East on the international scene. As on the regional level in the Middle East, convincing influential political figures was key to success. We therefore started in Switzerland, where Philippe Roch, a well-known politician strongly involved in nature conservation, opened doors of key institutions. His support was instrumental in presenting the cooperation projects at the Geneva Peace Week in 2015, followed by an event at the World Economic Forum in Davos under the auspices of the Honorable Shimon Peres in 2016 (Figure 3D). We also met key actors from the Swiss government to obtain support

from the Geneva Centre for Security Policy, former chief of staff of the Swiss Army Christophe Keckeis (Figure 3E), and diplomats. From Switzerland the next steps will be to unite other countries around this project.

From the Middle East to Other Regions in Conflict

Developing cooperation between countries in conflict is an endeavor requiring time and full dedication. This requires the long-term work of resilient actors able to support the initiatives through testing periods. This is particularly true where conflicts are deeply rooted in culture, tradition, and religion. Patience and creativity are required to devise an interdisciplinary approach satisfying all protagonists. The next ambitious step is using regional cooperation to pave the way for the signing of a peace treaty.

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