



## **Lesson #18: The Glory in Creation: Valuing Biodiversity**

By Rabbi Shaul David Judelman

We live in an amazingly diverse world, with approximately 8.3 million unique species described by scientists, and likely twice that number that have not yet been discovered.<sup>1</sup> Jewish sources teach that G-d has joy in the diversity and continuity of creation, and that G-d sees a purpose in each of these species. This biodiversity is an expression of G-d's glory, a testament to the extraordinary creativity of our Creator. As Chief Rabbi Jonathan Sacks<sup>2</sup> teaches, "the unity of God is to be found in the diversity of creation."<sup>3</sup>

One of Judaism's greatest beliefs is in the intention invested by the Creator in His Creation. Our tradition has a tremendous sense of appreciation for the diverse and numerous species on this earth. In addition, we benefit from and can learn a great deal from other species. As human beings, masters and stewards of the world, it is our responsibility to support the continuity of this diverse and extraordinary creation. Recognizing this should impel us to utilize the natural world with great care and responsibility.

### **Intentions of the Creator**

At the beginning of Genesis, the Torah describes human dominion over all things. These verses have shown themselves to be deeply prescient. Today's modern human technological development has demonstrated this dominion to the greatest extent. The metals in our computers, the organic compounds in our medicines and even the paper in our hands are all examples of our mastery over the world.

But in addition to being used by human beings, each species also has a Divine-given purpose. According to the Talmudic sage Rav, "Of all the things that the Holy One, Blessed be He created in this world, He created nothing without a purpose."<sup>4</sup> For example, the Midrash (Oral tradition) teaches, "Even things which appear to you to be superfluous in this world, like flies, fleas and mosquitoes, they are a part of the creation, and they carry forth the will of the Holy One, even the snake, the mosquito and even the frogs!"<sup>5</sup> All creatures from humans to mice to rivers to sand are seen as a manifestation of G-d's wisdom and glory. This incredible diversity is one of the wonders of our world.

This biodiversity can be a source of wisdom and inspiration for human beings. Scattered across the Oral Tradition are recordings of our Torah sages with appreciation of the great intricacies in the natural world. For example, Psalm 104 teaches us about the habitats of many animals and the perfection with which they fit into the natural order: "As for the stork, the cypress trees are her house. The high hills are a refuge for the wild

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<sup>1</sup> This figure does not count the potential millions of bacterial species See "Number of species on Earth tagged at 8.7 million," by Lee Sweetlove, 8.23.11, *Nature News*, based on a study published in PLoS Biology, online at <http://www.nature.com/news/2011/110823/full/news.2011.498.html>

<sup>2</sup> Chief Rabbi Lord Jonathan Sacks is Chief Rabbi of the United Hebrew Congregations of the Commonwealth, selected by the United Synagogue in Britain.

<sup>3</sup> *The Dignity of Difference*, Continuum: New York, 2003, p..53

<sup>4</sup> Babylonian Talmud, Tractate Shabbat 77b

<sup>5</sup> Bereishit Raba 10:7

goats; the rocks for the badgers.”<sup>6</sup> Ethics of the Fathers further teaches us what we can learn from other species: “Yehudah Ben Teima says, be bold like a leopard, with ease like an eagle, run like a deer and be valiant like a lion to do the Will of your Father in Heaven.”<sup>7</sup>

Often, to understand what our texts intend we are referred back to the plants and geographies of the land of Israel. Psalms 128:3 states, "Your children are like olive shoots around your table." Without knowing how olive trees grow shoots around the base of the trunk, and that the olive is unique in its refusal to accept grafts from other trees, the blessing of the psalm is rather empty and lost. These and countless other references across the Oral tradition demonstrate that our Sages had an intimate awareness of their natural world.

Maimonides teaches that contemplating creation helps us fulfill the commandment of loving the Creator. He writes:

“And what is the way to love G-d and fear G-d? When a person will contemplate in the incredible creation and the great creatures and see in them G-d’s inestimable and limitless wisdom- [that person] will love and praise and desire a great urge to know the Great Name. As King David said, ‘My soul thirsts for G-d, the Source of Life.’...As the sages said regarding love, that through love of G-d, we come to know [the One who] spoke and the world came to be”<sup>8</sup>

### **Continuity of Creation**

The Jewish tradition is rich with sources indicating the importance that G-d places on the continuity of species, from the prohibition against mixing species (kilayim)<sup>9</sup> to the requirement to send away the mother bird before taking eggs (shiluach haken).<sup>10</sup> The Ramban understands the “permanent existence” of creation to be the key reason for why G-d considered it “very good” on the sixth day,<sup>11</sup> and understands G-d’s instruction ‘*Let the earth sprout forth sprouts*’ to represent the intentional incorporation of the capability of renewal and regeneration into the scheme of creation.<sup>12</sup>

In the following excerpt from the Talmud, Rabbi Hanina bar Papa explores the source of G-d’s great joy in the Creation: from the fact that a certain species reproduces “according to its kind.”

Rabbi Hanina bar Papa explained the verse (from Psalms 104:31) “Let G-d’s Glory (Kavod) be forever, as G-d rejoiced with His creation.” [What was G-d’s great joy in Creation? What is the connection between the joy and the Glory?] The ministering angel of the world exclaimed this verse at the moment when the Holy One, blessed be He, told the trees to bring forth seed specific to each species, [for] the grasses, on their own accord, made a Talmudic deduction. [They reasoned:] “If the Creator desires for all the species to be mixed together, then why would He command ‘seed for each species’ to the trees?! [Apparently, therefore, He wants them to preserve their integrity and not be interbred.] And further- the trees stand each one distinctly yet they were commanded to bring forth their own seed- [therefore] we, the grasses must even more so need [to bring forth] our own seeds.” Immediately each grass brought forth seed for its own species and the Minister Angel of the world proclaimed, “Let His Glory be Forever, as G-d rejoiced about His creation.”<sup>13</sup> ”

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<sup>6</sup> Psalm 104:17-18. This lesson is elucidated in “L’ovda Uleshomra: Judaism and the Environmental Ethic,” by Ilana Stein, *Compendium of Sources in Halacha and the Environment*, 2005, published by Canfei Nesharim.

<sup>7</sup> Pirke Avot 5:23

<sup>8</sup> Hilchot Yesodei Hatorah, 2:2

<sup>9</sup> Leviticus 19:19

<sup>10</sup> See commentaries of Ramban and Abarbanel to Deuteronomy 22:6.

<sup>11</sup> Ramban to Genesis 1:11

<sup>12</sup> Ramban to Genesis 1:31. The Ramban makes a similar point in his commentary to Genesis 1:4.

<sup>14</sup> There are many Jewish sources that also teach this understanding. For example, see Midrash Rabbah - Leviticus 22:1, (Vilna edition), translation adapted from Soncino translation “And the superiority (yitron) of earth is in everything...” (Ecclesiastes 5:8)... Rabbi Judah said: Even things that seem to you superfluities in the world are also included among the things that are a benefit to the

In this teaching, G-d's glory is expressed by the Sages through the multitude of species, and their ability to procreate - to last "l'olam"- forever. The Sages saw G-d being joyous that the creations (in this case, the grasses) were seeking to continue their existence. It seems that the grasses recognized the effort invested in creating them and sought to preserve the unique character of their species. G-d rejoices when an element of creation understands and implements His will, in the same way as a parent rejoices upon seeing its child continue a path of goodness.

Jewish tradition teaches us that G-d considers the continuity of creation to be of importance. While of course species come and go, if by our actions we are directly causing the extinction of species, and certainly if human actions are as a group causing a mass extinction event at this time in history, we must pause to wonder if we are disrespecting the value of those creations in G-d's plan – and perhaps destroying aspects of creation imbued with Divine wisdom and intention.

Today, our actions have started to threaten the well-being of many eco-systems and the species therein. We are surely having dominion; but are we fulfilling our job as stewards? In our actions, how well are we applying the Creator's intention toward His Creation?

### **Biodiversity in Our Time**

Ecologists have discovered the extent of interdependence within all the disparate elements of creation. Without the sun, water and microbes in our topsoil we would have nothing to eat. Without the vast acreage of rain forests converting carbon dioxide to oxygen we would have trouble breathing. Even the most minute of species sometimes plays a critical role in the concert of life.<sup>14</sup>

Our sources allude to this incredible phenomenon every time we partake of this world - even after a simple drink of water. The after-blessing proclaims: "Blessed are You, Creator of many living beings and their lackings, for all you have created to sustain them - Blessed is the Life-Giver of all!" This blessing highlights the interdependence of all things.

Scientists define biodiversity as "all species of plants, animals and micro-organisms existing and interacting within an ecosystem."<sup>15</sup> Species diversity in an ecosystem enhances its ability to adapt to change. Just as the success of a sport team depends on a variety of skills in each player to adapt and address various challenges, a diverse spectrum of plant and animal life in each bio-sphere is needed to flourish amidst natural changes.

Maintaining species biodiversity is a global challenge which requires a global partnership for meaningful results. To address this challenge, in 2002, the 193 nations signing onto the United Nations Convention on Biological Diversity<sup>16</sup> adopted a 2010 target to achieve "a significant reduction of the current rate of biodiversity loss at the global, regional and national level, as a contribution to poverty alleviation and to the

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world; bast is for making ropes, twigs are for hedging gardens." Additional examples have been provided in the source sheet accompanying this article.

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<sup>15</sup> Vandermeer and Perfecto, Breakfast of Biodiversity: the Truth about Rainforest Destruction, 1995, Food First Books: Oakland, p. 185 as cited in Dr. Miguel A. Altieri, "The Ecological Role of Biodiversity in Agroecosystems," *Agriculture, Ecosystems and Environment* 74 (1999) p. 19–31, online at <http://www.geography.siu.edu/courses/429/AgroEco/AgroEcoC.pdf>

<sup>16</sup> The United States is not a party to this convention. Israel is. See the full list of parties at <http://www.cbd.int/convention/parties/list/>.

benefit of all life on Earth.” Later in 2002, this target was endorsed by world leaders at the World Summit on Sustainable Development in Johannesburg, South Africa.<sup>17</sup>

The second Global Biodiversity Outlook (GBO-2) in 2005 urged the importance of meeting this target, stating that “we are currently responsible for the sixth major extinction event in the history of the Earth, and the greatest since the dinosaurs disappeared, 65 million years ago.”<sup>18</sup> The GBO reports track approximately 3,000 wild populations of species.

The third Global Biodiversity Outlook (GBO-3), produced in 2012, acknowledged the failure of governments to meet their 2010 target. The report warned that “there is a high risk of dramatic biodiversity loss and accompanying degradation of a broad range of ecosystem services if ecosystems are pushed beyond certain thresholds or tipping points.”<sup>19</sup>

According to the GBO-3, amphibians are “deteriorating” in status, and nearly 25% of all plant species are estimated to be threatened with extinction. The report shows that between 1970 and 2006, the wild vertebrate species fell by an average of 31% globally, with the decline “especially severe in the tropics (59%) and in freshwater ecosystems (41%).” Findings indicate that species in all groups with known trends are, on average, being driven closer to extinction.<sup>20</sup>

Human welfare depends on the services provided by healthy, biodiverse ecosystems. However, as the GBO-3 reported, tropical forests, inland water and wetlands throughout the world continue to be lost at a rapid rate.<sup>21</sup>

According to the UN Environment Program, “Biodiversity loss makes ecosystems more vulnerable to shocks and disturbances, less resilient, and less able to supply humans with needed services.”<sup>22</sup> The GBO-3 report forecasts that effects of biodiversity loss and ecosystem disruption will be disproportionately felt by the rural poor, as they depend directly on biodiversity for a particularly high proportion of their basic needs.<sup>23</sup> One driver of biodiversity loss is habitat destruction, and this too affects human beings. For example, the damage to coastal communities from floods and storms can be dramatically increased when wetland habitats have been destroyed or weakened.

The effects of lost biodiversity will also be felt by humans in other ways, since we rely on plants and animals for food and medicine. This poses a threat to the health and well-being of millions of people directly dependent on the availability of wild species. Globally, about 80% of people in developing countries rely on traditional medicines, most of which are derived from plants.<sup>24</sup>

With respect to these losses, the Rambam taught,

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<sup>17</sup> Secretariat of the Convention on Biological Diversity (2006) Global Biodiversity Outlook 2. Montreal, 81 + vii pages, online at <http://www.cbd.int/doc/gbo/gbo2/cbd-gbo2-en.pdf>

<sup>18</sup> Ibid.

<sup>19</sup> Secretariat of the Convention on Biological Diversity (2012) Global Biodiversity Outlook 3. Montreal, 95 + vii pages, online at <http://www.cbd.int/gbo3/?pub=6667&section=6729>

<sup>20</sup> Ibid. The Food and Agriculture Organization (FAO) estimates that 19% of marine fish stocks are overexploited, 8% are depleted or recovering from depletion, while more than half are fully exploited.

<sup>21</sup> Ibid. Between 56% and 65% of inland water systems suitable for use in intensive agriculture in Europe and North America had been drained by 1985. The respective figures for Asia and South America were 27% and 6%. The report notes that “the overall projected degradation of inland waters threatens the prospects for food production from freshwater ecosystems. Coastal habitats continue to decline, which threatens highly valuable ecosystem services including the removal of “significant quantities” of carbon dioxide from the atmosphere.”

<sup>22</sup> “Biodiversity,” by Neville Ash and Asghar Fazel, UN Environment Program, online at [http://www.unep.org/geo/geo4/report/05\\_Biodiversity.pdf](http://www.unep.org/geo/geo4/report/05_Biodiversity.pdf)

<sup>23</sup> Ibid.

<sup>24</sup> GBO-3, “Species populations and extinction risks”: <http://www.cbd.int/gbo3/?pub=6667&section=6691>

“in every generation new benefits from herbs and types of fruits are discovered that were not known earlier, and many benefits are derived from them, and [while] it is not in man's capability [presently] to derive the benefits from everything that grows ... it will be revealed through experimentation as the generations pass.”<sup>25</sup>

In our times the prescient words of Maimonides have transpired.<sup>26</sup> Of 520 new drugs approved in the United States between 1983 and 1994, 39% were natural products or derived from them. In addition, nine of the twenty best-selling non-protein drugs in 1999, were derived, directly or indirectly, from natural products. These had combined annual sales of over \$16 billion.<sup>27</sup> On average, species of birds and mammals used for food and medicines face a greater extinction risk than species that are not so used. They are moving more quickly into higher risk categories, partly due to over-exploitation and habitat loss.

The five principal pressures directly driving biodiversity loss are habitat change, overexploitation, pollution, invasive alien species and climate change.<sup>28</sup> To address this threat, we need to improve our efficiency in the use of land, energy, fresh water, and materials, and support efforts to minimize wasteful consumption.<sup>29</sup>

Habitat loss is a key contributor to biodiversity decline. For example, in the United States, more than 85 percent of forest habitats have been permanently destroyed or logged in the United States and 99% of the eastern United States' forests have been cut.<sup>30</sup> We exacerbate this problem by buying unsustainable wood products. One of the main causes of forest destruction is illegal logging, fed by the high demand for timber and timber products in our stores and homes. The international trade of illegally logged products has been estimated at \$5 billion per year.

To help protect species diversity, ask questions about where your wood products (like garden furniture, tools or wood flooring) come from. Look for the Forest Stewardship Council label. If you don't see it, ask!<sup>31</sup> You can also buy used furniture and other products. And when disposing of furniture, give it to others, instead of throwing it out.

If you eat fish, another way to reduce species decline is to buy fish with robust populations. The Monterey Bay Aquarium's Seafood Watch provides helpful information to make more informed decisions.<sup>32</sup> Finally, do not buy products made from the skin, fur, bone, shell, beak or hooves of endangered species.<sup>33</sup>

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<sup>25</sup> Rambam, Introduction to the Mishna

<sup>26</sup> As of 1993, 121 prescription drugs sold worldwide came from plant-derived sources, and 25% of Western pharmaceuticals were derived from rainforest ingredients. Yet less than 1% of these tropical trees and plants had been tested by scientists. Over 100 pharmaceutical companies and several branches of the US government, including giants like Merck and The National Cancer Institute, engage in plant research projects for possible drugs and cures for viruses, infections, cancer and even AIDS. From James A. Duke. “Medicinal plants and the pharmaceutical industry,” p. 664-669. In: J. Janick and J.E. Simon (eds.), *New Crops*. Wiley, New York, 1993, online at <http://www.hort.purdue.edu/newcrop/proceedings1993/v2-664.html>

<sup>27</sup> Harvey, A., “Strategies for discovering drugs from previously unexplored natural products,” *Drug Discovery Today* #5, 2000, p. 294 –300, online at <http://www.sciencedirect.com/science/article/pii/S1359644600015117>. *Drug Discovery Today* is a monthly peer-reviewed scientific journal. As cited in Gaston, Kevin J., and John I. Spicer. *Biodiversity: An Introduction*. Wiley-Blackwell, 2003. An earlier study noted that 47 pharmaceuticals have been developed from rainforest plant extracts, and estimated that an additional 328 remain to be discovered. See Mendelsohn, R. & Balick, M.J.(1995) *The value of undiscovered pharmaceuticals in tropical forests*. *Economic Botany*, 49,223–228.

<sup>28</sup> *Global Biodiversity Outlook 3, Executive Summary*, available at <http://www.cbd.int/gbo3/?pub=6667&section=6673>. According to the GBO-3, as of 2010, these drivers are all either constant or increasing in intensity.

<sup>29</sup> Ibid.

<sup>30</sup> The US Department of Fish and Wildlife, “Important Facts about Habitat Loss and Birds,” May, 1999, online at <http://digitalmedia.fws.gov/cdm/ref/collection/document/id/272>

<sup>31</sup> See : <http://us.fsc.org/>

<sup>32</sup> The Seafood Watch is available at <http://www.montereybayaquarium.org/cr/seafoodwatch.aspx>.

<sup>33</sup> This applies especially when buying souvenirs when travelling. See

[http://wwf.panda.org/about\\_our\\_earth/biodiversity/what\\_you\\_can\\_do/](http://wwf.panda.org/about_our_earth/biodiversity/what_you_can_do/) for information on this and other ways to protect species.

In this article we have learned about G-d's intentionality behind the diversity of species in creation, the unfolding mystery of how each species is doing its part for the sustaining of the whole, and the potential medicines, insights and wonder we have yet to uncover in these species. Imitating the attributes of G-d is a central Jewish value,<sup>34</sup> and we must emulate G-d's concern for the diversity of His Creation. We can start by better preserving, observing and appreciating the incredible creatures living alongside us. Let us emulate the Creator with our appreciation of all of the creation, and take actions now to protect biodiversity for ourselves and our fellow creatures on the planet.

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<sup>34</sup> Babylonian Talmud, Tractate Sota 14a. There is a famous Midrash dealing with a conundrum presented in the verse "You, who cleaved to the Lord your G-d, are all alive today." (Deut. 4:4) After all, G-d is incorporeal- how could we be described as "cleaving" to a non-physical G-d? The Talmud answers that the intention is really that we will emulate G-d: "Rather, this means you should cleave to God's attributes. Just as God clothed the naked [Adam and Eve], so too you should cloth the naked. Just as God visited the sick [Abraham after his circumcision], so too you should visit the sick. Just as God consoled the mourners [Isaac after Abraham's death], so too you should console the mourners. Just as God buried the dead [Moses], so too you should bury the dead."