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# Species, the Value of

When animals, birds, and plants vanish from the landscape, this raises public concern. The Millennium Ecosystem Assessment, reporting a multinational consensus of hundreds of experts, concluded: “Over the past few hundred years, humans have increased species extinction rates by as much as 1,000 times background rates that were typical over Earth’s history” (2005a: 3). The US Congress, deploring the lack of “adequate concern [for] and conservation [of]” species, passed the Endangered Species Act (1973: §2(a)(1)). A quite effective international convention from the same year is CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora; CITES 1973). Loss of species seems intuitively bad, but why? What values are attached to species?

### Values of Species to Humans

Persons are helped or hurt by the condition of their environment, which includes a wealth of wild species. Humans often value species by finding instrumental uses – medical, agricultural, industrial (Chivian and Bernstein 2008). To give only a few examples: vincristine and vinblastine, extracted from a Madagascar periwinkle (*Catharantus roseus*), are used to treat Hodgkin’s disease and leukemia. A variety of wild tomato (*Lycopersicon chmielewskii*), found in Peru, has been bred into and enhanced the tomato for the US industry, making a firmer tomato for machine handling, resulting in multimillion dollar profits.

An obscure Yellowstone thermophilic microbe, *Thermophus aquaticus*, was discovered to contain a heat-stable enzyme, which can be used to drive the polymerase chain reaction (PCR), used in a gene-copying technique. The rights to the process sold in 1991 for \$300 million, and the process is now earning \$100 million a year. Norman Myers (2009) urges “conserving our global stock.” “To keep every cog and wheel is the first precaution of intelligent tinkering,” cautioned Aldo Leopold (1970: 190). Save all the parts. Who knows what might be useful?

Wild species may be indirectly important for the roles they play in ecosystems. They are “rivets” in the airplane, the Earthship in which we humans are flying (Ehrlich and Ehrlich 1981). The loss of a few species may have no evident results now, but the loss of many species imperils the resilience and stability of the ecosystems on which humans depend. Critics have responded that it is difficult to argue that every species is a rivet; rare ones are unlikely to be. The metaphor is faulty; Earth is not a well-engineered machine that needs all its parts. Ecosystems are more pluralist and loosely structured than that, even if there is sometimes truth to the “rivets” argument.

A further argument is that species, now especially the rare ones, are often clues to natural history. No sensible person would destroy the Rosetta Stone (named after the obelisk found at Rosetta in Egypt in 1799, which enabled deciphering forgotten languages of the ancient past). No self-respecting humans will destroy the mouse lemur, endangered in Madagascar and thought to be the nearest modern animal to the primates from which the human line evolved. Destroying species is like tearing pages out of an unread book, written in a language humans hardly know how to read, about the place where we live. But what if species are not resources, rivets, or Rosetta Stones?

A frequent argument is that, in a more enlightened view, human well-being depends on relationships not only with other humans, but with life on Earth. David Schmidtz explains: “It would be a failure of self-interest to care only about ourselves. We must care about something beyond ourselves. Otherwise we won’t have enough to care about, and will as a result be unhealthy” (2008: 3). If humans live on a wonderland Earth, they will be impoverished so long as they remain unappreciative of their rich surroundings – even if they do find some uses for these other species.

White persons in the US South became better persons when they abolished slavery, and stopped thinking of blacks only in terms of utility. Male whites are richer as a result of the liberation of women in their societies. A person who reforms his or her evaluation of wild species benefits because such a person is now living in a richer and more harmonious relationship with nature. This appeals to those advocating a virtue ethics: generous persons save the whales and butterflies and are the better off because of their increased virtues.

## **Noblesse Oblige**

At a basic level, a healthy and productive life in harmony with nature is quite possible without wolves on the landscape. But still more fundamentally, Bryan Norton argues, considering wolf policy (in Norway, similarly in Montana), legislation is needed to force the sheepherders to accept the wolves; and, accompanying that, they need to be persuaded to see that the wolves are good for them: “I would argue that in this case the local people ... should be pushed to change somewhat in the direction of wolf protection.” Otherwise, those sheepherders will “have sacrificed their birthright of wildness for a few sheep.” People should want wolves on the landscape lest future generations “feel profoundly the loss of wilderness experiences.” “Too often, local communities have acted on the basis of short-term interests, only to learn that they have irretrievably deprived their children of something of great value” (Norton 1999: 397–8, 308). Keep the wolves, and other endangered species, so that we and our children can tingle in awe. This may be a human benefit, but it also seems to be recognizing some value in the awesome wolves.

More pragmatically, there are debates about ownership of values associated with biodiversity. Historically, wild plant species, seeds, and germplasm have been

considered in the public domain, or part of “the common heritage of mankind.” But, increasingly, Third World nations have been claiming that species within their boundaries are their national property. The Convention on Biological Diversity begins: “States have sovereign rights over their own biological resources” and continues, “Recognizing the sovereign rights of States over the natural resources, the authority to determine access to genetic resources rests with the national governments and is subject to national legislation” (United Nations Conference on Environment and Development 1992: Preamble; Article 15). These nations are, at the same time, resisting patents and other intellectual property rights based on the development of genetic resources found on their lands, and held by developed nations.

Some natural resources, such as ores and trees, can be national resources, but it is not clear that nations can or should own species, which is more like owning the structure of gold than owning a deposit of gold. Did the Peruvian government, or the people of Peru, or the local indigenous people, own the tomato species found wild in their forests from which geneticists bred a useful gene into agricultural tomatoes? The Convention’s language of “access to genetic resources” may bypass questions of ownership, creating both problems and opportunities for the conservation of genetic biodiversity.

### **Species as Good in Themselves**

By a more radical account – one I have developed (Rolston 1988) – many claim that species are good in their own right, whether or not they are good for anything. The United Nations World Charter for Nature states, “Every form of life is unique, warranting respect regardless of its worth to man” (United Nations General Assembly 1982). The Convention on Biological Diversity affirms “the intrinsic value of biological diversity” (United Nations Conference on Environment and Development 1992: Preamble). Both are signed by most nations on Earth. An appraisal finding values in species as goods of their kind faces challenges, both biological and philosophical, which, from another perspective, offer opportunities for enlarging traditional frameworks of value (*see* INTRINSIC VALUE).

A consideration of species offers a biologically based counterexample to the focus on individuals characteristic in Western ethics. In an evolutionary ecosystem, it is not mere individuality that counts. The life that the individual has is something passing through the individual as much as something it intrinsically possesses, and a comprehensive respect for life finds it appropriate to attach duty dynamically to the specific forms of life. The individual represents, or re-presents anew, a species in each subsequent generation. It is a token of a type, and the type is more important than the token. Though species are not moral agents, a biological identity – a kind of value – is here defended. The dignity resides in the dynamic form; the individual inherits this, exemplifies it, and passes it on. Having a biological identity reasserted genetically over time is as true of the species as of the individual. Respecting that identity generates duties to species.

The appropriate survival unit is the appropriate location of persistent valuing, where the defense of life goes on in regeneration, as individual members of a species are given over to survival of their kind. Plants and animals not only defend their own lives; they defend their kinds. Such kinds are the dynamism of life. A shutdown of the life stream on Earth would be the most destructive event possible. In threatening Earth's biodiversity, the wrong that humans are doing is stopping the historical vitality of life.

Critics may respond that species can seem as made up as discovered, since systematists regularly revise species designations and routinely put after a species the name of the "author" who, they say, "erected" the taxon. No one proposes duties to genera, families, orders, phyla; biologists concede that these do not exist in nature. But on a more realist account, a biological species is a living historical form (Latin: species), propagated in individual organisms, that flows dynamically over generations. A species is a coherent, ongoing, dynamic lineage expressed in organisms, encoded in gene flow. In this sense, species are objectively there – found, not made by taxonomists. Species are real historical entities, interbreeding populations. By contrast, families, orders, and genera are not levels where biological reproduction takes place. This claim – that there are specific forms of life historically maintained over time – seems about as certain as anything else we believe about the empirical world, even though at times scientists revise the theories and taxa with which they map these forms. So far from being arbitrary, species are the real survival units.

The species is a bigger event than the individual, although species are always exemplified in individuals. Biological conservation goes on at this level too; and, really, this level is more appropriate for moral concern, a more comprehensive survival unit than the individual organism. For example, if the predators are removed, and the carrying capacity of a landscape is exceeded, wildlife managers may have to benefit a species by culling its member individuals.

Critics may continue that, even if species are biologically real, they are not valuable in a philosophically relevant sense, because they have no interests. Nicholas Rescher says,

Moral obligation is thus always interest-oriented. But only individuals can be said to have interests; one only has moral obligations to particular individuals or particular groups thereof. Accordingly, the duty to save a species is not a matter of moral duty toward it, because moral duties are only oriented to individuals. A species as such is the wrong sort of target for a moral obligation. (1980: 83)

But concern for species may transcend the coordinates of classical ethical systems. True, a species has no self-defending its life. There is no analog to the nervous hookups or metabolisms that characterize individual organisms, and no sentient interests. But perhaps this singular somatic identity, the good of its own, which is respected in individual organisms, especially those with felt experiences, is not the only process that is valuable (*see ANIMALS, MORAL STATUS OF*). Biology is multileveled, with processes at molecular, cellular, metabolic, organismic, species, ecosystems, and even global levels.

In the birth-death-birth-death system a series of replacements is required. Reproduction is typically assumed to be a need of individuals, but since any particular individual can flourish somatically without reproducing at all, indeed may be put through duress and risk or spend much energy reproducing, by another logic we can interpret reproduction as the species staying in place by its replacements. In this sense a female jaguar does not bear cubs to be healthy herself. Rather, her cubs are *Panthera onca* recreating itself by continuous performance.

A female animal does not have mammary glands nor a male testicles in order to preserve its own life; these organs are defending the line of life bigger than the somatic individual. The locus of the value that is defended over generations is as much in the form of life, since the individuals are genetically impelled to sacrifice themselves in the interests of reproducing their kind. The species line too is value-able, able to conserve a biological identity. Indeed it is more real, more value-able than the individual, necessary though individuals are for the continuance of this lineage (Rolston 1988). The species line is the vital living system, the whole, of which individual organisms are the essential parts. The species defends a particular form of life, pursuing a pathway through the world, resisting death (extinction), by regeneration maintaining a normative identity over time. The value resides in the dynamic form; the individual inherits this, exemplifies it, and passes it on. If so, what prevents value existing at that level?

## **Species Lines in Ecosystems**

A species is what it is, where it is. Particular species may not be essential in the sense that the ecosystem can survive the loss of individual species. But habitats are essential to species, and an endangered species often means an endangered habitat. The species and the community are complementary goods in synthesis, parallel to, but a level above, the way the species and individual organisms have distinguishable but entwined goods. It is not preservation of species that protects the relevant values, but the preservation of species in the system. It is not merely what they are, but where they are that one must value correctly (Ehrlich and Ehrlich 1981).

This limits the otherwise important role that zoos and botanical gardens can play in the conservation of species. They can provide research, a refuge for species, breeding programs, aid on public education, and so forth, but they cannot simulate the ongoing dynamism of gene flow over time under the selection pressures in a wild biome. They only lock up a collection of individuals; they amputate the species from its habitat. The species can only be preserved in situ; the species ought to be preserved in situ. That moves from scientific facts to ethical duties, but what ought to be has to be based on what can be.

Neither individual nor species stands alone; both are embedded in an ecosystem. Plants, which are autotrophs, have a certain independence that animals and other heterotrophs do not have. Plants need only water, sunshine, soil, nutrients, local

conditions of growth; animals, often mobile and higher up the trophic pyramid, may range more widely but in this alternate form of independence depend on the primary production of plants. Every natural form of life came to be what it is, where it is, shaped as an adaptive fit, even when species acquire a fitness that enables them to track into differing environments. A problem with exotic species, introduced by humans, is often that they are not good fits in their alien ecosystems. But the whole population or species survives when selected by natural forces in the environment for a niche it can occupy.

In addition to placing species in ecosystems in natural history, in environmental policy, the legislation to protect endangered species has often been used to protect as well the ecosystems of which they are part (such as the old growth forests of the Pacific Northwest, containing the spotted owl) (*see* WILDERNESS, VALUE OF). An ecosystems approach is increasingly regarded as more efficient than a single-species approach.

It might seem that for humans to terminate species now and again is quite natural. Species go extinct all the time. But there are important theoretical and practical differences between natural and anthropogenic (human-generated) extinctions. In natural extinction, a species dies when it has become unfit in habitat, and other species, competing more successfully, typically appear in its place, a normal turnover. By contrast, artificial extinction shuts down speciation. One opens doors, the other closes them. Humans generate and regenerate nothing; they dead-end these lines. Relevant differences make the two as morally distinct as death by natural causes is from murder. Extinction shuts down the generative processes, a kind of superkilling. This kills forms (species) beyond individuals, kills collectively, not just distributively. To kill a particular animal is to stop a life of a few years or decades, while other lives of such kind continue unabated; to superkill a particular species is to shut down a story of many millennia, and leave no future possibilities.

## **Win–Win Conservation**

Conservationists may advocate a “win–win ecology” so that “the Earth’s species can survive in the midst of human enterprise” (Rosenzweig 2003). The values of species must complement human values. When persons are in harmony with nature, everyone wins, equally people, rhinos, and tigers. These conservatives also may be skeptics. The best you can do is enlighten self-interest. That is all that is politically, economically, sociologically, biologically feasible, or even imaginable. But then again, we defend our interests against others only to learn that many of our interests are not a zero sum game, as we often learn in the human–human parliament of interests. Many community goods are goods in common (*see* CIVIC VIRTUE). We can learn that again in the human–nature community of interests. The best strategy, on this view, is to argue that persons living abundant lives need to experience the wonderland natural world. Biodiversity was formerly too much devalued, as if it were nothing but consumable resources. Biodiversity in place

benefits people. People and species can win together. “In the long run, what is good for our species will also be good for other species, taken as species” (Norton et al. 1995: 115).

David Schmitz puts this appealingly: “If we do not tend to what is good for nature, we will not be tending to what is good for people either ... We need to be human-centered to be properly nature-centered, for if we do not tend to what is good for people, we will not be tending to what is good for nature either.” In Africa, he continues, “threatened species will have to contribute to the local economy if they are to have any hope of survival” (2008: 235–6, 231). He follows Brian Child: “wildlife will survive in Africa only where it can compete financially for space” (1993: 60). Likewise and more bluntly, Norman Myers: “In emergent Africa, you either use wildlife or lose it. If it pays its own way, some of it will survive” (1981: 36).

Such accounts start with appeal. They advocate realistic compromise. They also can become blatantly pragmatic. They result in saving endangered species only if they are worth more alive than dead. Many would argue that even if, lamentably, such evaluations of species are inescapable in Africa and other developing nations, they ought not to be taken as morally commendable in developed nations. Only the charismatic megafauna bring in tourist dollars; most endangered species cannot pay their own way, and will be lost. Surely it is morally superior to respect more inclusively the values present in, and at jeopardy in, endangered fauna and flora, large and small. Perhaps it is not moral at all to respect species only so far as they have cash value.

But even in developed countries there are trade-offs. The win-win account, if sometimes true, can be naïve about conflicting priorities. The Delhi Sands flower-loving fly was standing in the way of building a hospital in California, and also blocking an industrial development with 20,000 jobs (Booth 1997). A California state senator exclaimed, “I’m for people, not for flies.” In such a context, one might try to find some usefulness for the flies – as rivet, resource, or Rosetta Stone. This is likely to fail. As promising an argument as any is to urge respect for a unique species with clever form of life defending a good of its own. The fly (and other interesting species) inhabits only a few hundred acres of ancient inland dunes, reduced from once 40 square miles. It cannot move, but the hospital and other developments could be built elsewhere.

Sometimes the win-win argument does seem to work. The California gnatcatcher (*Polioptila californica*), a threatened species, inhabits some undeveloped but expensive real estate in southern California. Developers reluctantly agreed to a checkerboard pattern of development, reserving lands for the small bird and other species of concern. They found, somewhat to their surprise, that the parcels they did develop had considerably increased value, as homeowners greatly valued homes near the conservation areas punctuating the sprawl of subdivisions (Mann and Plummer 1995). Gnatcatchers got their habitat and people got homes they valued more with the open space.

## Biodiversity on Earth

Concern for “endangered species” has broadened to become concern for “biodiversity.” This recognizes values present at all levels: genes, organisms, species, ecosystems, regional biomes, landscapes, oceans (Wilson 1992). Such a perspective is found in the Convention on Biological Diversity, signed by 192 nations. The Ecological Society of America urges: “Achieving a sustainable biosphere is the single most important task facing humankind today” (Risser et al. 1991: 627). The Millennium Ecosystem Assessment is blunt: “At the heart of this assessment is a stark warning. Human activity is putting such strain on the natural functions of Earth that the ability of the planet’s ecosystems to sustain future generations can no longer be taken for granted” (2005b: 5).

Persisting through vicissitudes for two and a half billion years, speciation is about as long-continuing as anything on Earth can be, generating the fundamental life-values on the planet. What humans are doing, or allowing to happen through carelessness, is shutting down the life stream, the most destructive event possible. On the scale of evolutionary time, humans appear late and suddenly. Even more lately and suddenly they increase the extinction rate dramatically. What is offensive in such conduct is not merely senseless loss of resources, but the maelstrom of killing and insensitivity to forms of life. What is required is not prudence but principled responsibility to the biospheric Earth. Only the human species contains moral agents, but conscience ought not to be used to exempt every other form of life from consideration, with the resulting paradox that the sole moral species acts only in its collective self-interest toward all the rest (*see ENVIRONMENTAL ETHICS*).

**See also:** ANIMALS, MORAL STATUS OF; CIVIC VIRTUE; ENVIRONMENTAL ETHICS; INTRINSIC VALUE; WILDERNESS, VALUE OF

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