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IN PRAISE AND DEFENSE OF BIODIVERSITY

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I come as a conservative speaking out against a radical situation. I want to speak about a miracle and a tragedy, about despair and hope.

I will start with the miracle . Something amazing occurred on this planet about two-and-a-half billion years ago. From a few elemental building blocks, life created itself. And in the intervening millenia, a spectacular diversity and abundance of life has evolved. We know that there are at least 1.4 million kinds of living things. Actually biologists agree that this figure greatly underestimates what is really out there; we simply have not discovered most species yet, especially in places like the canopy of tropical rainforests, or in the depths of the seas. Estimates of the actual number of species in the world vary between biologists, ranging from five million to thirty million species. You can see that we are just beginning to get to know our neighbours.

Biological diversity exists on other levels than just the sheer numbers of species. Looking among ourselves shows the incredible genetic diversity within just one of these millions of species. And on the level of landscapes , we all know that a desert is as different from a rainforest as is the arctic plain from a coral reef.

We live on a stunning planet. And the farther away we travel from it, the more unique we see it to be. Space travellers have consistently been moved by the beauty of our blue-green orb floating in the black of the universe. Our planet's remarkable festival of life interacts with itself in miraculous ways of which we are just beginning to understanding. What could be a bigger miracle, a greater gift, than this rich legacy of diverse life?

The tragedy , of course, is that we are mindlessly throwing it all away, and not slowly, but in a huge hurry. As I said, this is a radical situation, quite unprecedented in the history of the Earth.

However, there is nothing unusual about extinction; it has always happened. As our planet's surface has changed shape and climate, some species have died off and new ones have evolved to take their places. We estimate that throughout Earth's history roughly 450 million species have existed. In other words, the incredible diversity we see today represents less than five percent of what has existed. But the extinction of the other 420 million species occurred over the immense vastness of evolutionary time, which is long enough to allow new lifeforms to arise. As some species died off, others arrived on the scene. The larders of biological diversity were replenished with vigorous new forms of life, trying new experiments in adaptation to an ever-changing world.

Just yesterday an unusual new form appeared on the scene: a gangly, almost furless mammal, which was not particularly strong and not particularly fast, but which had a knack for figuring things out. Yet another new way of doing things! We think of our species as very special, and in fact we are. Our evolution has been amazingly rapid and dramatic, our tool-using ways have developed into stunning technological prowess.

This brings us again to the tragedy of our tale: we are destroying the handiwork of creation. We are unravelling the mysterious webs of interrelationship on this planet just as we begin to understand them. Almost every scientist who has studied our current extinction crisis agrees that currently several species per day are going extinct, never to exist again. This rate of extinction is at least one thousand times higher than ever before in the history of the world. Worse, if we keep on this track, this rate will accelerate to several species per hour going extinct by the turn of the century. If we do not change our ways, biologists estimate that by a century or two from now, as many as half the forms of life on Earth may have gone extinct. Perhaps saddest of all is that we can no longer blame ignorance for our behaviour: we know full well what we are doing, yet we continue to knowingly let our sister species perish.

Why does all this matter? Do these numbers really mean anything? Numbers are abstractions, but out on the land and in the water and in the sky real animals and real plants are dying, and their unique ways of life coming to abrupt ends.

Aldo Leopold, the visionary ecologist of the first half of the century, had a knack for summing things up neatly. He noted that the first rule for intelligent tinkerers is to never throw away any parts. When we try to fix our car we would never think of throwing away the carburetor, or even any bolts or nuts. Yet we blithely toss away our very evolutionary heritage, all the parts that make our planet home and whole. It seems we treat our cars better than we treat our planet.

How has all this come about? How are we killing off all these forms of life? In many cases we directly and intentionally persecute other species. We hunt alligators to make shoes, dig up saguaro cacti to sell to gardeners, and kill elephants for their tusks. Earlier in this century the federal government, in good but misguided faith, exterminated the native populations of predators who threatened our dreams of economic expansion and our feelings of dominance. Wolves, grizzlies, and mountain lions all ran free throughout the West in our grandparents' day. But the howl of wolves is heard here no more, and mountain lions hide out only in deep havens.

I am an optimist by nature and perceive a glimmer of hope from the way our attitudes towards predators have changed since those days. Now our government spends more time protecting wildlife than killing it. No, we are not completely enlightened — being imperfect humans, we probably never will be — but we have come a long way.

The greatest threat to biodiversity, however, is not abating, it is only getting worse. This is the destruction of habitat, the destruction of home for all those lifeforms. A grizzly bear cannot live in the urban and suburban sprawl of today any more than any of us could live in the arctic without clothes or shelter. And yet we know that grizzlies used to live here, in the mountains and on the plains, where now we find Denver, Phoenix, and innumerable other settlements. We destroy plant and wildlife habitat by almost everything we do: building cities and housing developments, farming and ranching, logging, building dams, overgrazing, spraying pesticides, herbicides, and over-pumping groundwater.

Not only is habitat getting destroyed, but it is getting chopped up into little pieces. Not only do we lack enough total habitat, but we lack expanses of unbroken habitat. One reason we do not have more mountain lions is that there are too few areas of undisturbed habitat large enough for a lion to roam around, find dinner, find another lion, and not find you or me. Biologists refer to this process of chopping up habitat as "habitat fragmentation," and recognize it as a crucial factor in the destruction of species.

About a century ago we began to set aside a few tracts of land, in an attempt to keep them in some semblance of their natural state. This idea of national parks, Nature preserves, wildlife refuges, and the like spread from the American West throughout the world. Although originally motivated by utilitarian desires, the concept of preserving wild Nature is one of the best ideas of our species. But less than 3Earth's surface is set aside to protect wildlife.

A recent study looked at the sizes of some of the largest Nature reserves in the Western United States and Canada. The shocking news was that none of the eight reserves studied appeared to be large and whole enough to really protect and preserve its widest-ranging mammal inhabitants. The sad and horrifying news is that Nature preserves do not preserve Nature. The reason is that Nature preserves are never designed with that end in mind. In fact, they are never designed at all. The truth of the matter is that when it comes to preserving lands for Nature, we take what we can get, not what other species need. Human politics takes precedence over biological realities.

One of my occupational hazards is being a doom-speaker. Talking about the destruction of Nature does not exactly make me the life of the party. But as I said, I am an optimistic sort, and I do see some encouraging trends.

The most fundamental heartening news is that we as a species are becoming more aware. It is only through actively changing our consciousness that we can hope to change the world. General public awareness of environmental issues and ecological interrelationship is much greater than it was a couple decades ago. When I entered high school in the late sixties even the word "ecology" was almost unheard of by all but a handful of scientists. The first Earth Day — not quite twenty years ago — changed all that.

Second, academics are leaving their ivory towers and becoming activists. In the past decade an entire new discipline has sprung up, known as conservation biology. Conservation biology is self-defined as a crisis discipline, and its practitioners are called upon to take action. This new interdisciplinary science applies biological principles to conservation problems. This elevation of biology above politics is absolutely essential.

Third, a great diversity of humans are coming together to seek solutions to the problems we inflict on those millions of other species. Participants at one recent conference on these issues, for example, included bankers, philosophers, politicians, and even the Dalai Lama of Tibet, as well as a great many biologists.

And fourth, government is beginning to respond. (This reminds me of my favorite bumper sticker: "If the people lead, someday the leaders will follow.") In the last twenty-five years several laws have been passed in this country (U.S.A.) which bring hope. The Wilderness Act of 1964 demands that we save our wild lands; thus far we have set aside over 90 million acres as designated wilderness. The National Environmental Policy Act (NEPA) of 1969 requires us to consider the consequences on non-humans of any federal land management plans and procedures. The Endangered Species Act of 1973 reminds us of our responsibility to act on behalf of species which have been pushed to the brink of extinction. In 1976 we passed the National Forest Management Act, which specifically directs the Forest Service to preserve biological diversity in our national forests. And as I write, Congress is considering a biodiversity bill, which would further strengthen our national commitment to a sustainable future for all species.

To me, this is all heartening. But it is dangerous to pat ourselves on the back prematurely, to delude ourselves into thinking we have solved anything. The trends I have just mentioned merely indicate that we have taken the first tentative steps down a better path for the world. Let us feel good about changing our course, but let us not cease our efforts on the long journey we have just begun. And we would be deluding ourselves to think we have solved anything yet. Laws, especially, are only as good as we let them be, and there are major flaws in all of the laws mentioned.

From a biological point of view, the way we designate wilderness areas is often a travesty. Right now, Congress deliberates on the fate of proposed Bureau of Land Management (BLM) wilderness areas here in Arizona. To choose one example, Burro Creek is an exceptionally diverse ecosystem, which includes one of the largest populations of black-hawks in the world, and one of the few remaining free-flowing streams in Arizona. That it is an ecological treasure is undeniable. Yet its future as wilderness is in doubt because the employees of the nearby Cyprus Bagdad mine, fearful of losing their jobs, mounted a letter-writing campaign (at the suggestion of their employer). Ironically, their jobs will disappear anyway, as all mining jobs do. The culprit will not be wilderness, but the inherent boom- and-bust nature of the mining industry. Meanwhile, the planet may lose a unique biological treasure, in an ill-fated attempt to delay the

inevitable collapse of this local economy.

The National Environmental Policy Act has been a major step in the right direction, but also has proliferated a mind-boggling morass of paperwork, court boondoggles, and pricey consulting firms that do not in themselves further the cause of saving the planet.

The Endangered Species Act was a visionary law when it was passed, but it has not worked very well. The intention of the law, of course, was to bring species from the edge of extinction back to health, or in the language of the law, to "recovery." Last year the General Accounting Office (GAO), the research branch of Congress, examined the effectiveness of the Act and arrived at a disappointing conclusion. Since 1973 only five American species have recovered, while twelve have gone extinct. Of the five recoveries, only one was due to conscious action on our part. And the listing of species in the first place is often blocked by political and commercial self-interest groups, as in the well-publicized case of the northern spotted owl. But politicians still pat their own backs for being environmentalists, whether the law they passed works or not.

And as for the National Forest Management Act, and the planning it mandated each national forest to do, suffice it to say that commodity industries such as timber, mining, and ranching continue to speak with louder voices than those representing biodiversity.

So what can we do? Thinking about these vital concerns, I have assembled a set of "Ten Commandments for Biodiversity:"

1. Participate in the decisions our species makes: write letters to politicians, newspapers and friends, testify at hearing and meetings;
2. Consume less and recycle the rest;
3. Learn all you can about how Nature works, about how human power works, about the relationship between the two;
4. Be good to each other — even those with different views — and to yourself; how we treat the Earth reflects how we treat each other, and how we feel about ourselves;
5. Bond with Nature: go for walks, watch birds, listen to the rain;
6. Get to know a piece of Earth and speak for it;
7. Place biology — which is to say life — above politics; few biological decisions are ever made on purely biological grounds;
8. Think like a mountain: develop a long-term sense of time, which transcends your own life;

9. Respect the fact that all forms of life have value and dignity in and of themselves;
10. Remember that change happens slowly, and solutions are rarely simple.

The Dalai Lama wrote recently on conservation and extinction, and his words bear repeating: "The only cure for present world problems, including that of the natural environment, is for people to replace ignorance with knowledge, greed with generosity, and lack of respect for life with humanitarian values."

Ecology teaches us that all beings have an essential role to play in maintaining a healthy planet. We would all do well to remember that part of our job is

to listen

to feel

to speak

and to act

for all.

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