

1 of 4 DOCUMENTS

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The list of life on Earth

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How would you spend \$ 1 billion? One way is a mission to catalogue every living species on the planet

Kevin Kelly was at a dinner last year when he heard another guest make a startling remark. "A money manager for rich people was complaining about how difficult it is to give away a billion dollars," Kelly, a co-founder of Wired magazine, recalls.

The guest went on to explain that giving it away too slowly meant interest would accrue and the sum would never disappear; giving it away quickly meant frittering away a lot on the logistics of how to give it away. But it got Kelly thinking - what would he spend a billion dollars on?

He decided he would catalogue every species of life on Earth in the space of a generation. More than a year later his audacious vision is more than dinner-party speculation. After an initial gathering of interested scientists at the California Academy of Sciences, it is a fully fledged project with its own organisation, the All Species Foundation, and 40 prominent advisers.

Among them is Edward O. Wilson, a Nobel Prize-winning biologist and one of the most respected authorities on biodiversity, who finds it strange that science knows the number of stars in our galaxy but not the number of species on this planet. The foundation even has its first donation - \$ 1 million (Pounds 700,000) from the Schlinger Foundation, which was set up by an entomologist.

The idea is to record, name and take a genetic sample of every living thing on Earth within 25 years. The list would be made available on the Web, free to all. As Kelly says, if we discovered life on another planet, the first thing scientists would do would be to make an inventory. That has never been done for Earth.

He makes no bones about his hope that, in addition to donations from such institutions as the United Nations and the World Bank, an Internet or information technology pioneer will want to unburden his or her considerable wealth to this end. Kelly says: "The All Species Inventory meets almost all the criteria of a lean, cascading good deed. It is truly global, fast, deep, nature-based, technology-savvy, and entirely do-able. And it feels good." Despite the dot-com collapse, he believes there is a lot of money out there.

At the California meeting last year - there will be a second conference at Harvard University this autumn - supporters issued an explanation of why it was important to list all, not just some, species: "Because all is mythic, inclusive, and challengingly elusive. It captures the human imagination. The idea of all encompasses all species, all life, all geographic locations, and all nations...it has that shoot-for-the-moon, larger-than-life, over-the-top inspiring quality about it - and has

been the time-honoured dream of taxonomists and natural historians."

These are poetic words, but a practical nightmare. The All Species Inventory would be a logistical effort even more challenging than the International Human Genome Project, which sought to catalogue the chemical make-up of DNA. About 1.7 million species have been described and named; a small percentage of these are probably duplicates. However, there are thought to be up to 200 million forms of life. In other words, 99 per cent of all species have never even been looked at. Terry Gosliner, a biologist at the California Academy of Sciences, compares it to only knowing some of the periodic table of elements: "We are trying to do biology knowing perhaps only a tenth, or one hundredth, of our species. It is an immense handicap that does not need to exist."

Knowing all species, others say, is as important as knowing the complete anatomy of the human body. Species classification has tended to be undertaken in a rather piecemeal manner, with individual scientists or groups focusing on a particular habitat. Some put their results on the Web - these will be important sources of data for the All Species Inventory - but not all.

Also, while many plant samples are taken, they can languish in drawers for years; it can take up to seven years between collection and publication. Some samples are never afforded that distinction at all, which is why one aim of the project would be to uncover specimens gathering dust in herbariums and museums around the world.

Where the genome project was undertaken largely by two research groups - one in Washington and one in Cambridge - registering every species means exploring every country and every kind of territory. It means scouring the bottoms of the oceans and the peaks of mountains, visiting every forest and lake, sampling volcanic craters, coral reefs, deep soils and polar ice.

The cost extends far beyond just collecting samples in the field. Indigenous collectors need training, the samples need storing, expensive DNA extraction needs doing and computers and software need procuring. However, estimates of the total cost vary widely. Kelly puts the price tag somewhere near \$ 3 billion over 25 years. Wilson believes it will be about \$ 500 for each species, so an inventory of 100 million species - half the possible number of all species - would cost nearer Pounds 50 billion.

Kelly envisages it as a model 21st-century project - decentralised, with computers doing the managing and local people the taxonomy. It would bring badly needed money into some areas, while at the same time educating a new generation of taxonomists.

But, not everyone feels that this ambitious project is worthwhile, especially since there is a continuing dispute about what constitutes a species. (Kelly retorts that a huge project such as this would force the issue.)

Among a handful of those polled by The Scientist magazine, opinion on its merits were divided. David Hillis, from the University of Texas and an All Species adviser, thinks it "imperative": "Understanding the biodiversity of Earth certainly will not be easy, but is probably no bigger a technical problem than was sending people to the moon, and the potential pay-off is many times greater."

However, Norman Pace, from the University of Colorado, says: "The count-all-the-critters folks are frankly naive." Paul Ehrlich, from Stanford University, adds: "I see little point in trying to catalogue all species on Earth. Before significant information can be gathered on them, most will have become extinct."

Kelly, who doesn't hold a college degree and describes himself as a science groupie, brushes off such scepticism. On the foundation's website, he asks: "Can you imagine a project other than the All Species Inventory with a larger global impact, that would consume less internal resources, require fewer staff, generate more scientific knowledge and more commercial products, serve the beleaguered environment more, further increase appreciation of Earth as much, and do a better job of satisfying our longing to do something bigger than ourselves?"

I wonder if the billionaires are listening.

The website for the foundation can be found at www.all-species.org

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