Top conservation issues to look out for in 2013

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Top conservation issues to look out for in 2013

6 December 2012, by Tamera Jones

A UK-led team of researchers has identified 15 issues that could affect the diversity of life on Earth in 2013.

Concentrating solar power plant.

They include using synthetic DNA to genetically modify organisms, soaring demand for coconut water, and competition for land to grow plants for fish farming.

Other topics the researchers highlight include dam-building in the Andean Amazon, using coral nurseries to restore reefs, and the commercial use of short portions of antimicrobial proteins.

The emerging issues are the result of an attempt to pinpoint threats, opportunities and developments that aren't widely recognised, but which need further research in case they turn into big problems for biodiversity.

> 'This kind of horizon scanning exercise can be useful to avoid situations where we're ill-prepared to deal with the consequences.'
> **Professor Bill Sutherland, University of Cambridge**

The thinking behind the exercise is to identify potential concerns, so we can respond more effectively if the researchers' projections prove accurate.

Indeed, so-called horizon scanning is used by private and public organisations to inform processes related to policy, risk assessment, strategic planning, and innovation.

'This kind of horizon scanning exercise can be useful to avoid situations where we're ill-prepared to deal with the consequences. One example is biofuels. They were promised to be a green alternative to fossil fuels, but no-one anticipated that pristine rainforest would be cleared for them,' explains Professor Bill Sutherland of the University of Cambridge who led this study.

Sutherland led similar exercises in previous years to figure out which issues most need conservationists' attention, given limited research funds.

In this latest study, published in *Trends in Ecology & Evolution*, he invited 19 experts to submit up to five little-known emerging issues they thought could affect global biodiversity in the near future. The group came up with 72, which – after

some debating – they whittled down to 15.

Many of them relate to new forms of energy production, changes in how we produce or store food, and synthetic biology – the creation of new forms of life in the lab. Most sit squarely in the 'threat' camp, but a few could be seen as opportunities that might end up benefiting the diversity of life on Earth.

Detecting invasive species

One includes using super-sensitive molecular techniques to extract tiny amounts of DNA from the environment to detect the presence of rare or invasive species. These techniques have been successfully used to detect a secretive frog and a salamander in the US, as well as invasive American bullfrogs at 38 places in France where before they were thought to exist in just seven.

The scientists highlight other opportunities such as protecting and restoring tropical forests using tiny unmanned aerial vehicles. Remotely-controlled drones could be used to collect and plant local seeds. This approach is a lot cheaper than raising seedlings in nurseries then planting them out. And recent advances in GPS technology means the process could be automated.

Another includes using coral nurseries to help restore damaged reefs. Conservationists have already set up at least ten coral nurseries in the Caribbean, where major reef-building corals are now rare.

Some of the topics identified by the researchers, like 3D printing or the rapid growth of concentrated solar power, while in many ways beneficial to the environment, could also have their downsides. The point is that right now, nobody knows how or even if these technologies will affect biodiversity.

'We hope horizon scanning will help us identify emerging threats to biodiversity before rather than after they've had a major impact,' says co-author Professor Ken Norris from the University of Reading, and biodiversity theme leader for the Natural Environment Research Council.

'In this paper we've once again identified both new threats and opportunities presented by a number of emerging issues. It is perhaps telling however, that most of the effects we have on the natural environment continue to give rise to negative consequences for biodiversity and ecosystem services,' says Professor Michael Depledge from the European Centre for Environment & Human Health, another co-author of the study.

The study was funded by the Natural Environment Research Council, the European Centre for Environment and Human Health and the Royal Society for the Protection of Birds.

The 15 issues that could affect biodiversity in 2013

- Rapid growth of concentrated solar power
- Widespread development of thorium-fuelled nuclear power
- Seabed located oil drilling and processing
- Accelerating water cycle
- Proliferation of hydropower in the Andean Amazon
- Species loss as a driver of global environmental change
- Vegetarian aquaculture feed
- Rapid rise in global demand for coconut water
- Detecting aquatic species with environmental DNA
- Use of coral nurseries for reef restoration
- Forest conservation and restoration by micro unmanned aerial vehicles
- The 3D printing revolution
- A link between biodiversity, allergy and autoimmune disease
- The commercial use of antimicrobial peptides
- Synthetic genetics

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