

## **Biodiversity**

This issue of the *Radar* journal takes a closer look at biodiversity and its potential to contribute to liability exposure. Several recent publications have helped set out the issues.

Environmental Regulation has developed very significantly over the past 30 years, principally with respect to pollution prevention and, protection of valuable sites and resources such as drinking water. But biodiversity is a more generalisable concept which helps in the understanding of the "Common Good" that nature provides. Protection of this could be achieved by a combination of regulation and liability for remediation. The scope of the latter is currently unpredictable, but would initially operate through regulation and nuisance. This could change if concepts such as material interest, proximity and foreseeability are changed to suit political ends. While there is uncertainty, there is a need for insurers to engage with politicians.

### **Biodiversity: An Introduction**

#### Insurance

Insurable interest in the environment is far from new. Third party liability has been thoroughly tested in the courts and EC Directives have increased the scope and extent of insurable expenditure.

In the past decade politicians and theoreticians e.g. at the United Nations Environment Programme (UNEP), have begun to draw together the various forms of financial interest in the environment under the heading "biodiversity". Engaging with politicians is of course a strategic concern of insurers; politicians need to understand that insurers are already operating in this field. Availability and sustainability of insurance to support legal initiatives ought to be of interest to politicians.

UNEP has an insurance industry initiative for the environment, begun in 1995, and part of the Finance Initiative. It is voluntary. Along with intentions to be energy conscious, the signatories to this initiative promised to assess environmental issues when assessing risk, preventing loss, handling claims and making investments and promised to let everyone know what they were doing to keep their own house in good shape. More complex was the promise to design insurance products that would promote environmental protection.

#### Current regulatory framework

Conservation of species, protection of habitats, safety of water supply, management of fisheries and forests etc. are all attempts to ensure meaningful control of the environment. Specific regulatory components such as the environmental liability directive and the many and various directives on waste, water quality and protected habitats etc. form parts of a more coherent (but as yet, fuzzy) picture under the heading of biodiversity. The Convention on Biological Diversity, the EC Biodiversity Vision, the *Ramsar* Convention on wetlands (1971), the Bonn Convention on migratory species (1979), the Convention on International Trade in Endangered Species (CITES, 1973), the Bern Convention on the Conservation of European Wildlife and Natural Habitats (1980) the Ministerial Conference on the Protection of Forests in Europe (MCPFE), and the EU biodiversity baseline are all manifestations of this political interest. As yet unclear in their implementation are the Renewable Energy Directive (EC, 2009) The National Emission Ceiling Directive (EC, 2001) Marine Strategy Framework Directive (EC, 2008)

#### Biodiversity: background

The intention of using the term biodiversity is to convey the idea that our lives depend on a variety of biological systems both natural and man-made and, that the interactions between these systems and our well-being are complex and interdependent. Although technically complex, the basic principle is 'not putting all your eggs in one basket'. Diversity in nature is equivalent to diversity in a risk portfolio.

At an emotional level, reducing the diversity of natural resources and biological systems is generally regarded as a threat, or "bad thing". It is usually expressed as a concern about loss even though some loss of biodiversity could well be rationally viewed as beneficial. For example, in nature there is the potential for resistance to most antibiotics. Loss of such resistance genes should increase the usefulness of these medicines...but would be result of a reduction in biodiversity. Smallpox has all but been eradicated. Diversity is not always welcome.

The complexity of these interactions and dependencies is such that a man-made intervention could have a direct intended effect on one system but unintentional and wide-ranging effects on other systems. Complexity also means that it is unclear which parts of the system are most important now or will be in the future. Complexity is made even more sensitive by the existence of feedback loops in the system, leading to non-linear (apparently disproportionate) effects of change.

Foreseeability of loss and estimation of loss are key principles driving insurance. Even at a basic level of understanding, it is quite clear that ecosystems are very unpredictable. Insurance may be the right way to manage such uncertainties, but insurers would probably have to impose very complex constraints.

#### Biodiversity building blocks.

From a technical point of view, the four basic building blocks of biodiversity are:

- genes,
- species,
- habitats and
- ecosystems.



Our dependency and influence on these building blocks are mediated by economic, social and environmental drivers. It is in the attempt to manage biodiversity by economic measures that new insurance issues directly arise, e.g. remediation costs as part of the environmental liability directive. But indirect effects on insurance, e.g. demand for cover, can also be influenced perhaps as a result of economic decline or as a result of new land use, both of which could occur as a result of environmental change.

It must be noted that nature has continually changed each of the basic building blocks listed above: genes, habitats, ecosystems and species. Natural processes are not emotionally identified as threats to biodiversity. For some people conservation of habitats and species is a duty based on very dearly held principles of responsible stewardship. Potentially irreversible blots on this 'landscape' have a fascination which is emotional in origin. Biodiversity proponents often appeal to such notions as a short-cut for debate.

There may be a rational explanation for this: natural change is usually on a time scale that is slow when compared with infrastructure renewal. Slow change allows time for adaptation, demand for capital is predictable. As a general rule, human needs over the centuries have been met by gradually adapting to the available ecosystems and habitats. Historic investment in successful adaptation is enormous e.g. water supply networks are designed on the basis of predictable inputs and outputs.

Adaptation investment is so large that short term remodelling on a regional or national scale is a significant threat to capital supply. Man-made threats to the sustainability of such infrastructure must be regarded as risky and necessarily invite the attentions of politicians. It is proposed here that if adequate adaptation to new standards of biodiversity was always cheap and quick it is unlikely that much notice would be taken of this subject at all. If the cost of maintaining predictable support from natural systems was low, there would be little rational debate of biodiversity as an ideal.

The word sustainability is usually prompted at this point. Sustainability has also become a by-word for good practice. It has become an ideal. As with biodiversity, the proposal here is that sustainability is only really important as a concept if the cost of adaptation or the cost of failing to adapt is too high.

#### Strategy

Insurance could be seen as the intermediate level of risk management taking its place between individual and national levels of investment. Investment in response to adverse events could be insured, e.g. remediation of contaminated land. If this route is favoured then the price of insurance will depend very strongly on the specified quality of an adequate intervention. Adequacy could be determined by sentimental or economic standards. E.g. a preference for returning land to its pre-contamination state would be sentimental, returning land to pre-contamination state of utility would be economic. The civil courts would tend to identify with economic standards (via the concept of indemnity), the statute approach could follow both sentimental and economic models. The price would vary accordingly.

#### Ecosystem resources

Biological systems provide:

- a number of basic functions that are essential for human well being, e.g. good soil quality for agriculture, supply of oxygen, rain water management...
- a number of services could be assigned a net worth or natural capital e.g. forests, water supply, fisheries, landscapes, recreation space. Deciding how to make such evaluations is a political matter but which could affect the insurance regime.

These services are now formally classified as follows:

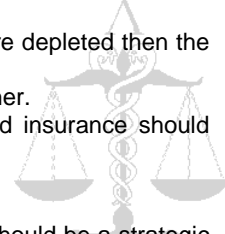
- Provisioning Resources, e.g. harvestable food stuffs, wood, clean water...
- Regulating functions, e.g. carbon sinks, bioremediation, water flow management
- Cultural services, e.g. beauty spots

- Support services which underpin each of the above e.g. soil development, habitats, oxygen production...

Of these, the ones with the most obvious direct insurable interest are provisioning resources. For example, wild fish may be poisoned by a pollution event, the polluter should pay. Forest fires, tannery spills etc. are all potentially insurable either by first or third party policies.

Indirect effects on regulation and support functions should also influence insurance market capacity. For example:

- If an economic activity ceases because the necessary natural resources are depleted then the need for insurance in that location reduces.
- If resilience against extreme weather events is reduced, losses may be higher.
- If bogs are drained then flooding becomes more likely. Demand for flood insurance should increase.
- If land level is lowered by water extraction then flooding will extend further.



In other words both the risk and market size are affected by biodiversity and there should be a strategic insurance response. Such assessment and response was under way long before politicians began to group the issues under the banner of biodiversity. However the intensity of scrutiny has now increased and should be increasingly engaged with by insurers.

At a political level the concern is that loss of biodiversity threatens the ability of ecosystems to sustain their natural provisioning capacity and perform regulating functions. The unknown unknowns are regarded by many as being large and significant (the term catastrophic is often rolled out); the result is that a precautionary response is often called for.

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