



## **Position statement**

### **ECOSYSTEM SERVICES**

#### **ISSUE**

It is often difficult to place value on fisheries and good ecological function of rivers and lakes in the context of the many demands that are being placed on water and aquatic environments. However, it is evident that the slow erosion of normal ecosystem form and function is having a profound effect on the economy by creating adverse conditions such as lowered presence of fish in our rivers and lakes, increased sensitivity to pollution or increased incidences of flooding. One approach that is now advocated is the Ecosystem Approach to development and management that incorporates the concept of ecosystem services and focuses on management inputs that maintain or restore ecosystem processes as the key to conservation. Several definitions have been proposed for ecosystem services but, in general, they are benefits that people obtain from ecosystems. Consideration of the outputs from healthy ecosystems as services means that they can be costed, especially as the former contribution of healthy ecosystems has to be paid for from other sources as the systems degrade. They can also be placed in a framework of benefits to society of maintaining healthy ecosystems.

#### **POSITION**

The Institute wishes to draw attention to the ecosystem approach and ecosystem services as a prime focus for planning and management of the ecology and fisheries of aquatic systems. It advocates use of this approach in river planning within the framework of the new river districts and their different basins, and in interpreting good ecological status according to the Water Framework Directive.

The approach is currently one of the best ways of calculating the financial benefits to our society of having functional aquatic ecosystems. As the present structure of River Basin Districts for river basin planning for implementing the Water Framework Directive is going to pose problems for operation at the individual catchment level. Nevertheless management plans are going to have to be developed for individual rivers. Here initiatives by the Environment Agency may need the active participation of people –scientists, IFM members, angling clubs etc – at the level of each basin. At that level success in planning can only be guaranteed by a more holistic approach whereby the whole services concept is considered rather than the narrow interests of any one sector.

#### **SUPPORTING INFORMATION**

The ecosystem approach was espoused by the Convention on Biological Diversity in 2000 at its Meeting in Nairobi, where the following principles were adopted.

1. The objectives of management of land, water and living resources are a matter of societal choice.
2. Management should be decentralized to the lowest appropriate level.
3. Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems.
4. Recognizing potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context. Any such ecosystem-management programme should:
  - a. Reduce those market distortions that adversely affect biological diversity;
  - b. Align incentives to promote biodiversity conservation and sustainable use;
  - c. Internalize costs and benefits in the given ecosystem to the extent feasible.
5. Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target of the Ecosystem Approach.
6. Ecosystems must be managed within the limits of their functioning.
7. The Ecosystem Approach should be undertaken at the appropriate spatial and temporal scales.
8. Recognizing the varying temporal scales and lag-effects that characterize ecosystem processes, objectives for ecosystem management should be set for the long term,
9. Management must recognize that change is inevitable.
10. The Ecosystem Approach should seek the appropriate balance between, and integration of, conservation and use of biological diversity.
11. The Ecosystem Approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.
12. The Ecosystem Approach should involve all relevant sectors of society and scientific disciplines.

A number of classifications exist for ecosystem services – see for instance Holmlund and Hammer (1999); Parliamentary Office of Science and Technology (2007) and Haines-Young and Potschin (2007).

Typical services provided generated by aquatic systems and marine and freshwater fish populations are:-

### **Supporting services**

Fundamental processes that support the other categories:

- Cycling of nutrients
- Linkage between aquatic and terrestrial ecosystems
- Linkage within aquatic ecosystems
- Transport of energy
- Maintenance of sediment processes
- Maintenance of genetic, species and ecosystem biodiversity
- Transport of nutrients, carbon and minerals

### **Provisioning services**

Products that are used directly to support human life:

- Production of food from wild stocks
- Aquaculture production
- Control of hazardous diseases

Supply of water

### **Regulating services**

Services that regulate physical and chemical processes:

- Regulation of food web dynamics
- Regulation of ecosystem resilience
- Redistribution of bottom substrates
- Regulation of carbon fluxes from water to atmosphere
- Self purification of water
- Carbon sequestration
- Regulation of flood pulses for flood protection
- Control of algae and macrophytes

### **Cultural and information services**

Services that contribute to physical and mental well-being, understanding and education:

- Supply of aesthetic values
- Supply of recreational activities
- Acting as ecological memory
- Assessment of ecosystem stress
- Assessment of ecosystem resilience
- Revealing evolutionary tracks
- Provision of historical information
- Provision of scientific and educational information

Management strategies should aim to conserve the full range of services if possible, although in certain circumstances, such as flood protection, some will be awarded higher priority than others.

### **FURTHER READING**

Holmlund, C.M. & Hammer, M. 1999. Ecosystem services generated by fish populations. *Ecological Economics*, 29: 253–268.

Haines-Young R. and Potchin M. 2007. The Ecosystem Concept and the Identification of Ecosystem Goods and Services in the English Policy Context - A Review Paper. <http://www.ecosystemservices.org.uk/reports.htm>

Parliamentary Office of Science and Technology 2007. Ecosystem Services Postnote 281 march 2007.

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