Rev. sci. tech. Off. int. Epiz., 2002, **21** (1),103-123

International regulation of wildlife trade: relevant legislation and organisations

M.E. Cooper [1] & A.M. Rosser [2]

(1) Department of Wildlife and Animal Resources Management (WARM), Faculty of Veterinary Medicine, Makerere University, P.O. Box 7062, Kampala, Uganda and Durrell Institute for Conservation and Ecology, University of Kent, Canterbury, United Kingdom. Correspondence: P.O. Box 153 Wellingborough, Northamptonshire NN8 2ZA, United Kingdom
(2) The World Conservation Union (IUCN), Species Survival Commission (SSC) Wildlife Trade Programme, 219c Huntingdon Road, Cambridge, CB3 0DL, United Kingdom

Summary
Trade in wildlife brings into play a variety of legislation from several distinct areas of law. Many species of wildlife are subject to restrictions on international movement with the aim of protecting wild populations from over-exploitation. Animal health legislation is strictly applied to the movement of most animals to prevent the spread of infectious diseases between importing and exporting counties. The welfare of animals in the course of trade requires consideration and relevant legislation has been put into place, particularly in respect of transportation. A number of institutions have an impact on the trade itself or on the legislation that regulates wildlife trade on an international basis.

Keywords
Animal – Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) – Export – Guidelines – Health – Import – Legislation – Trade – Welfare – Wildlife.

Introduction

There is substantial international movement of wildlife in the world today. Almost every instance in which wildlife is transported across a national boundary gives rise to legal implications. Whether those people involved in the movement are aware of this or not or whether they choose to observe or ignore the requirements, it is essential that the authorities, organisations and others concerned with wildlife trade be conversant with the relevant laws.

International trade in wildlife is regulated or influenced in a diversity of ways and by a number of institutions, as well as governments and supra-national bodies. The contribution or influence of these bodies also varies from drafting, implementing and enforcing legislation to providing non-legislative material such as guidelines and codes of good practice or by providing advice or applying persuasion.

This chapter attempts to clarify the areas, levels and content of the legislation that affect international trade in wildlife. In addition, the bodies involved, their roles and influence on such trade are examined.

The production, implementation and enforcement of legislation on the cross-border movement of animals are performed by the national authorities of individual countries or regional groups of countries. Although all legislation is based on sovereign decisions made at national levels, countries are also bound by the provisions of the international treaties to which they are parties and should, therefore, base their legislation on the provisions of these treaties.

General principles

Areas of law

The areas of law that are the most significant in international wildlife trade are as follows:

– animal health

– animal welfare

– international movement of endangered species.

It is worth noting at the outset that legislation, with regard to animal health in particular, frequently applies not only to live animals but also to carcasses, and parts and derivatives.

More than one piece of legislation may apply to the import or export of a shipment. Thus, the international movement of an animal listed by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) often requires the authority of not only a CITES permit but also of permits and health certification issued under animal health controls (11). In addition, individual countries may have national wildlife legislation that requires the export of indigenous species to be specifically authorised by a permit issued by the national conservation authority. The national laws on CITES stem from a common source, the Convention, whereas animal health laws were derived from national laws at the first instance and are frequently based on the *International Animal Health Code* and *International Aquatic Animal Health Code* of the Office International des Epizooties (OIE: World organisation for animal health) (35, 36). There is also a considerable amount of activity aimed at bringing about the harmonisation of animal health laws, both at a regional level (27) and through the trade rules of the World Trade Organization (WTO).

The legislation itself is often complex, varies from country to country, from species to species and disease to disease. Consequently, it may be possible to talk in generalities but when dealing with specific situations it is essential to consult the actual legislation that applies at that time and in that place.

Levels of legislation

Legislation on the international trade in wildlife is to be found at several levels, namely, international, regional and national. The principal laws are set out in Table I.

Some explanation of the effect of legislation and other provisions at the different levels is necessary for an understanding of the implication of specific laws.

International legislation

In the context of this chapter, international legislation refers to global treaties (or conventions) and agreements that are open to participation by all nations. The CITES Convention applies specifically to the subject of this chapter. Just over 150 countries have either signed or ratified CITES, the prime purpose of which is to regulate trade in the species listed in its Appendices, either by outright prohibition or by monitoring trade levels.

The Convention on Biological Diversity (CBD, or Biodiversity Convention) encourages parties to protect the biological diversity in their countries through a variety of mechanisms. They are also encouraged to manage and reap benefits from their genetic resources that are in demand from other countries (22, 28, 42). In a number of circumstances, this has led to curbs on, or careful regulation of, the international movement of genetic material, thus affecting trade in certain species, particularly non-human primates, and to sensitivity about the export of tissue samples for commercial purposes. The Convention or, more specifically, national legislation designed

Table I
Laws and other measures relevant to the trade in wildlife

Level	Animal and aquatic animal health	Endangered species	Welfare
International	World Trade Organization and Sanitary and Phytosanitary Agreement	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	International Air Transport Association Regulations
	International Animal Health Code and *International Aquatic Animal Health Code* (Office International des Epizooties: OIE)	Convention on Biological Diversity (CBD)	CITES Guidelines
		Guidelines of the World Conservation Union (IUCN)	*International Animal Health Code* (OIE), Chapter 1.4.
Regional			
European Union	European Union directives (numerous)	European Union and CITES Regulation	European Union Regulation (transport of animals)
Council of Europe			Council of Europe Convention (transport of animals)
National	Laws on control of disease and movement	Laws implementing CITES and CBD Species protection	Anti-cruelty laws: – general – transport Welfare codes (e.g. Great Britain, New Zealand and others)

to control the exploitation of genetic resources may therefore impinge upon international wildlife trade in certain circumstances.

The WTO has the overarching responsibility for regulating international trade, including the trade in wildlife (48). For the purposes of this chapter, it is important to focus on the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement), since this text provides common principles on which national animal health laws must be based for the purpose of international trade. This Agreement, ratified in 1995, clearly states that import measures cannot be discriminatory, or constitute unjustified trade barriers, must be based on science and conducted with transparency. For the purpose of animal health and zoonoses it recognises the OIE as the relevant organisation which sets the standards for terrestrial and aquatic animal health and zoonoses upon which countries have to base their import measures (34, 35, 36, 37).

Regional legislation

Two examples of regional legislation occur in Europe, that produced by the European Union (EU) and the Council of Europe.

The EU comprises (December 2001) fifteen Member States and is primarily a commercial and political union. Extensive legislation is produced by the EU and is aimed at unifying the Member States by, *inter alia*, harmonising (making alike) the import measures and internal measures applicable in all the EU Member States.

The EU legislation takes two major forms, namely: regulations and directives. Regulations take immediate effect in the Member States and national legislation is not required. In EU countries, CITES is implemented by way of regulations. The only necessity for individual national laws on CITES in the EU is to provide for the enforcement of the provisions of the regulations in each country.

Directives, on the other hand, are addressed to Member States, requiring them to implement the provisions of the directive by legal or administrative means. The animal health legislation largely takes this form and is put into effect in the laws of individual countries. There may, therefore, be some national variation in the manner of implementation and content of the national legislation.

The Council of Europe has forty-three Member States from Europe and adjacent areas. It is primarily concerned with social and cultural issues, such as human rights, democracy and the environment. The European Conventions are open to adoption by countries outside the Council of Europe as well as its members. It has produced several European conventions on the welfare of animals and one on conservation.

Other examples of regional harmonisation can be found among regional treaties such as those of the North American Free Trade Agreement (NAFTA), the regional trade agreement between the United States of America (USA), Canada and Mexico, *Mercado Común del Sur* (MERCOSUR, the Southern Cone Common Market), the regional trade agreement between Argentina, Uruguay, Paraguay and Brazil, the Southern African Development Community (SADC), the regional agreement for trade and forms of regional co-operation. However, when legal responsibilities are involved, these regional accords can neither supersede national legislation nor can they discriminate against countries that are not members of such regional groups.

National legislation

National legislation is that produced and enforced by individual countries and includes laws to implement the provisions of international and regional conventions and agreements. Animal health and welfare legislation and the implementing legislation for CITES, the SPS Agreement and regional provisions are to be found at the national level. In countries with a federal constitution, some of this legislation may be made by the sub-national components such as provinces, states or cantons. While it may be necessary to refer to both state and national laws for internal trade, for the purposes of international trade, these sub-national provisions cannot supersede national legislation, and they must also comply with the provisions of the WTO SPS Agreement.

Local legislation

If the process of trade is considered to commence at the point at which an animal is taken from the wild, then local or even customary law may also have an impact in some circumstances. However, the remit of this chapter is that of trans-frontier movement.

Enforcement of legislation

There is no mechanism in the CITES for the enforcement of its provisions other than at national level. Likewise, the animal health and welfare laws have to be enforced by using the judicial systems of individual countries. In addition, in respect of animal health, the WTO requires the OIE standards and recommendations to be upheld in accordance with the provisions of the WTO SPS Agreement. The WTO provides a mechanism for the resolution of trade disputes relating to this Agreement.

Organisations concerned with international trade in wildlife

The are numerous organisations that are concerned with international wildlife trade in some way. The nature of their involvement is disparate and can be classified as shown in Table II.

While the prime action on the regulation of international trade in wildlife originates from governments, other organisations

Table II
Organisations relevant to international wildlife trade

Organisation	Type of organisation and status	Powers/activities
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Secretariat	Established by treaty, about 150 parties are individual countries or European Union members	Co-ordinates conventions and organises conferences and other meetings of the parties
Convention on Biological Diversity (CBD) Secretariat		
United Nations Environment Programme (UNEP)	United Nations Agency	Concerned with environment. Hosts the secretariats of several conservation treaties, including CITES
Food and Agriculture Organization (FAO)	United Nations Agency	Concerned with world food supply including fish, water and forest resources
		Publishes relevant national laws and collaborates with CITES on sea fishery
World Trade Organization (WTO)	International organisation: 141 Member Countries	Provides rules on world trade, including non-tariff barriers, such as animal health controls and import licensing
Office International des Epizooties (OIE)	Inter-governmental organisation: 158 Member Countries	Sets international animal and aquatic animal health standards enforced under the WTO Sanitary and Phytosanitary Agreement
World Conservation Union (IUCN)	Numerous members: individuals, organisations, government agencies and NGOs	Extensive network of individuals and bodies involved in all aspects of conservation
TRAFFIC	Non-governmental organisation (NGO) Worldwide Fund for Nature (WWF) and IUCN	Monitors and investigates wildlife trade and provides research and information
Numerous	NGOs Members are individuals or bodies, international, national or local	Promote diverse aspects of conservation by providing financial support, activities, research, education, lobbying, etc.

also make a substantial contribution within the scope of their remit and activities.

In some circumstances, some overlap of influence exists between international legislation and organisations. Thus, while the role of the WTO SPS Agreement is considered to predominate when animal health controls affect international trade, the relationship between this Agreement and CITES may not yet have been ascertained (23). The Food and Agriculture Organization (FAO) and CITES have overlapping interests in the management for fish stocks in that commercial fishing includes the intentional or incidental taking of CITES species and there has been collaboration on the assessment of risk to species (21), while the OIE has the responsibility to provide the standards, guidelines and recommendations on the health and well-being of aquatic animals through the *International Aquatic Animal Health Code* (34, 36).

The FAO has also published a series of national legislation models relevant to food and agriculture and this includes animal health, animal welfare and wildlife legislation.

Animal health

World Trade Organization

Since 1948 animal health measures affecting trade have been subject to the rules of the General Agreement on Tariffs and Trade (GATT). In the previous rounds on GATT negotiations, the Agreement on Technical Barriers to Trade was negotiated. Although this agreement was not developed primarily for the purpose of regulating animal health measures, it does cover technical requirements dealing with animal health measures. Member governments have agreed to use relevant international standards except when they consider that these standards will not adequately protect health. They have also agreed to notify other governments, through the GATT secretariat, of any technical regulations which are not based on international standards.

Since sanitary measures, including animal health measures, can easily restrict trade, GATT member governments have long been concerned about the need for clearer rules regarding their use. As a result of the Uruguay Round of the GATT, reducing the incidence of other barriers to trade, governments became increasingly concerned that sanitary measures might increasingly be used for protectionist purposes. The signing of the SPS Agreement at the end of the Uruguay Round closes this potential loophole. At the same time, the GATT was transformed into the WTO with much clearer and stricter dispute settlement procedures.

The SPS Agreement sets out clearer and more detailed rights and obligations for animal health as well as for food safety and plant health measures that affect trade. Countries are permitted to impose only those requirements which are needed to protect

health, and which are based on scientific principles. A government can challenge the animal health requirements of another country on the grounds that there was not sufficient scientific evidence to justify their being maintained.

The SPS explicitly recognises the right of governments to take measures to protect animal health, as long as these are based on science, are necessary to protect health and do not unjustifiably discriminate against other trading partners. Likewise, governments continue to maintain their sovereign right in determining their own level of animal health protection required. Neither the WTO nor another international organisation can interfere with this right. The SPS Agreement does, however, require governments to 'harmonise' or base their national measures on the international standards, guidelines and recommendations developed by the relevant international organisations, such as the OIE for the purpose of terrestrial and aquatic animal health and zoonoses (35, 36), unless they have a justified scientific reason not to do so.

National animal health measures will not violate the SPS Agreement simply by being stricter than international standards. In fact, the SPS Agreement explicitly permits governments to impose more stringent requirements than those based on international standards. However, governments which do not base their national requirements on relevant international standards may, if this difference gives rise to a trade dispute, be required to scientifically justify their higher standard.

Since the creation of the GATT in 1948, it has been possible for a country to challenge the animal health laws of another nation. The SPS Agreement makes much more explicit not only the basis for the health requirements that affect trade, but also the basis for challenges to those requirements.

By ratifying the WTO Agreement, governments agree to be bound by the rules of the multilateral trade agreement attached to it. In the case of a trade dispute, the dispute settlement procedures of the WTO encourage the governments involved to find a mutually acceptable bilateral solution. If the governments cannot resolve their dispute, they can choose to follow any of several means of dispute settlement, including good offices, conciliation, mediation and arbitration. In a formal dispute on SPS measures, the WTO panel seeks scientific advice through a technical expert group. The OIE is generally consulted on the designation of certain experts of this group. If the panel concludes that a country is violating its obligations under an agreement attached to the WTO Agreement, normally it will recommend that the country take such actions as necessary to bring its measures into conformity with its obligations. Although the WTO SPS Agreement does not explicitly mention the protection of the environment or animal welfare, it can be interpreted that all of the provisions of the Agreement aiming at the protection of life and health include free-living animals and plants of the species covered in the Agreement. There have been a number of cases in which environmental protection or animal welfare measures have been challenged under the GATT-WTO Agreements (26) and there are a range of questions including the relationship of the conservation treaties such as CITES, that have yet to be answered (23).

In addition, specific animal health requirements of the OIE are most frequently applied on a bilateral basis between trading countries, in particular when these countries are not members of the WTO.

World organisation for animal health (Office International des Epizooties)

The WTO recognises the OIE as the relevant organisation for the purpose of animal health and zoonoses standards. The OIE, or World organisation for animal health, was established in 1924 and today it represents the opinion of 158 Member Countries. The International Animal Health Code Commission and Fish Diseases Commission of the OIE are the bodies responsible for drafting and recommending standards for adoption by the International Committee of the OIE. The OIE *International Animal Health Code* (35) applies to mammals, birds and bees and contains the standards which are presented in the form of chapters dealing with specific animal diseases, such as foot and mouth disease or anthrax. It also provides recommendations for the formal procedures, such as veterinary certification, for the prevention of disease transmission when trading internationally in animal and animal products. There is a separate manual (*Aquatic Manual*) and code (*Aquatic Code*) for aquatic animals that relate to fish, molluscs and crustaceans used for farming or for release into the aquatic environment, but not yet to aquatic amphibia, reptiles, birds or mammals (34, 36). For the purpose of trade in wildlife, interested parties should consult the OIE *Code* and *Aquatic Code* chapters that deal with those diseases of economic or zoonotic importance and to which wildlife species are susceptible or for which they may act as vectors. When establishing new regulations, or when conducting international trade, countries are encouraged to consult the specific recommendations in the OIE *Code* and *Aquatic Code* relevant to the commodity (i.e. animals, animal products, aquatic animals or aquatic animal products) being traded and the animal disease(s) of concern. The OIE *Manual of Standards for Diagnostic Tests and Vaccines* (37) is the document providing the guidelines for the standardisation and quality control of diagnostic tests and vaccines. The OIE also publishes reports on the incidence in wildlife of the diseases with which it is concerned.

National import and export

When animals are being moved between countries it is usually necessary to comply with the legislation of the countries involved that is intended to prevent the spread of animal diseases. The legislation usually relates to animals and diseases of economic and zoonotic importance. Although the primary aim is to protect livestock and companion animals (including bees and aquatic species farmed for food or other products),

such provisions may also apply to non-domesticated species when they fall within the scope of the relevant laws. Reptiles are rarely affected unless the movement is regulated because it involves pathogenic material from such species, or their potential role as intermediate or over-wintering hosts of certain pathogens, such as equine encephalitis viruses.

The legislation applies not only to live animals, animal products (used for food or other purposes) and germplasm (embryos, ova and semen) but also to pathogenic material which is subject to import controls. Thus, the movement of diagnostic or DNA samples is likely to require a permit and be subject to restrictions.

Export and import regulations vary in detail from country to country, as do the national levels of control and surveillance. There may be agreed standards within regional groupings and bilateral co-operation to facilitate the surveillance and control of animal diseases and the international movement of animals and animal products. However, common features and the general principles are summarised below. The OIE also sets general standards for animal health import and export procedures with which individual countries are encouraged to comply and that are used by the WTO in trade regulation (35).

Exports of animals and animal products are subject to certification by an official veterinarian in regard to freedom from specified diseases of the animals or animal products and to the area of their origin. Animals may be held in quarantine before departure. On import, animals and animal products should enter a country at an officially designated border post and be subjected to checks by an official veterinarian and administrative checks of the accompanying documentation. Customs checks will also be involved. Animals that fail these checks may be refused entry, quarantined or destroyed. Some countries require import and export permits.

Animal welfare

Many countries have legislation relating to the welfare of animals. The extent and quality of such laws vary considerably throughout the world from countries where it is highly developed and actively enforced to others where it is minimal or non-existent.

There is no legislation on welfare with global application, although the CITES Convention addresses the welfare of species listed in the Appendices during shipment under CITES permits. However, CITES generally keeps strictly to the terms of this provision and declines to concern itself with the welfare problems that occur during the phase of trade from the time that a CITES specimen is taken (from the wild or captivity) up to the point that the animals travel under CITES permits (44). Guidance has been issued by CITES for the transport of CITES species (8) and provisions issued by the International Air Transport Association (IATA) also exist on the care and accommodation to be used for the air transport of almost all species. These codes, the IATA Regulations and the CITES Guidelines are not in themselves legislation but they have been given legal status in countries where they have been incorporated in national laws. In the EU, the directive on welfare in transport requires member countries to comply. Where countries have incorporated these or other such guidance in their national law, they can enforce such provisions in their national courts. On the other hand, the various guidelines of the World Conservation Union (IUCN) (Table III) (which are not welfare provisions as such), as with many other aids to good practice, do not have such status. Following their requirements is, however commendable, voluntary and not legally enforceable. Nevertheless, CITES has incorporated those guidelines relating to the disposal of confiscated animals in its Resolution Conf. 10.7. and recommended parties to take note of the advice therein.

Table III
Guidelines of the World Conservation Union (IUCN) relative to the movement of wildlife

Guideline	Specialist Group	Date of adoption by the IUCN Council
IUCN Guidelines for the Prevention of Biodiversity loss caused by Alien Invasive Species	SSC Invasive Species Specialist Group	February 2000
IUCN/SSC Guidelines for Re-introductions	Re-introductions Specialist Group	1995
IUCN Guidelines for the Placement of Confiscated Animals Closely related to CITES Resolution Conf. 10.7: Disposal of confiscated live specimens of species		February 2000
IUCN Policy Statement on State gift of animals		September 1987
IUCN Position Statement on Translocations of living organisms: introductions, re-introductions and re-stocking		September 1987
IUCN Policy Statement on Captive Breeding	Captive Breeding Specialist Group	September 1987

SSC : Species Survival Commission
CITES : Convention on International Trade in Endangered Species of Wild Fauna and Flora

At a regional level in Europe, there are several provisions on welfare of animals. Although these relate primarily to domesticated animals, some may apply to non-domesticated species while they are in captivity. The Council of Europe has conventions on the welfare of farm, research and companion animals, humane slaughter and the international transport of animals. Free-living wildlife rarely features in animal welfare legislation but most species are covered while kept in captivity. The EU has acceded to the Council of Europe conventions, and has directives on transport, on conditions of breeding of some species and on animals used in research. Directives also exist on the protection of wild birds and on the conservation of wildlife and habitats that contain restrictions on methods of trapping and hunting. As mentioned earlier, such provisions have to be transposed into national legislation and are implemented and enforced at the national level.

Most welfare legislation is adopted and enforced at national level. Welfare laws are usually based on core provisions that make it illegal to treat animals cruelly. Some countries have had legislation for over 100 years and many have periodically revised and improved their provisions on welfare in the light of modern practices and international or regional legislation. Welfare legislation only occasionally applies to free-living wildlife, although conservation, hunting and trapping laws usually incorporate protection in the breeding season and restrict inhumane or unfair hunting and trapping methods.

Welfare law usually includes provisions relating to the following:

– General ill treatment, such as causing or allowing an animal to be injured or suffer, the failure to provide treatment for illness or injury and deprivation of food or water, accommodation that causes suffering. There are moves in new national legislation, led by New Zealand, to impose a positive duty to care for an animal rather than stating it in prohibitive terms (33).

– While most laws on transportation are designed for domestic animals, some include additional provisions that relate specifically to non-domesticated species. These deal with the general well-being of an animal during transport, for example, the provision of attendance, food, water and stops for rest. There may also be provisions on the construction and dimensions of containers and vehicles in which animals are moved. As mentioned earlier, there are also guidelines that apply in international transportation provided by CITES (9) and IATA.

In many countries, legislation is supplemented by guidelines or codes of practice. Even in the absence of legislation, non-statutory guidelines can be produced to encourage good welfare practices in a particular situation. Extensive and varied literature on animal welfare, produced by many countries, ranges from scientific publications to practical guides and from philosophical treatises to propaganda.

Convention on International Trade in Endangered Species

The Convention

The CITES is a global treaty, membership of which is available to all governments of the world (9). The Convention was opened for signature in 1973 and entered into force on 1 July 1975. By December 2001, there were 155 countries that had become party to the Convention (also known as the Washington Convention, from the place where the Convention was concluded, but is commonly referred to as 'CITES').

The Convention applies to situations in which CITES-listed species are moved across international boundaries. While animals remain within the territory of a country, trade or movement is regulated by national legislation and CITES is not relevant.

While the parties are required to implement and enforce the Convention, there are no powers, beyond persuasion, to force them to do so. Nevertheless much has been done over the years to bring parties into conformity and, under Resolution Conf. 8.4, the Secretariat has the authority to identify and report upon non-compliant countries. In relation to other legislation, the Convention neither overrides national and international legislation relating to trade in, taking possession or transport of CITES specimens, including customs, public health, and veterinary matters (Article XIV.2), nor does it affect a number of provisions regarding marine species.

Operating mechanism of the Convention

The Member States meet every two years at a Conference of the Parties in order to carry out the duties specified in Article XI of the Convention, namely: to deal with fiscal matters, make procedural rules, to review the working of the Convention, make amendments to the appendices and to deliberate on other matters submitted to the conference (in accordance with Resolution Conf. 4.6). The conference is attended not only by the parties (which have a vote) but also by international and national governmental and non-governmental bodies (Article XI). In recent years, the latter have exceeded the number of parties involved. They contribute substantially to the deliberations of the conferences and provide research and information (as well as promoting their interests), despite their having no vote.

The CITES Secretariat administers the Convention at the international level. This is based in Geneva and is provided by the United Nations Environment Programme. Its role, outlined in Article XII, is, *inter alia*, to organise the conferences of the parties, publish the Appendices, produce reports and make recommendations for the implementation of the provisions of the Convention. It also carries out tasks assigned by the Conference of the Parties. The Secretariat is required to notify parties if there is evidence of a species that is being adversely

affected by trade or if it becomes aware of a failure to implement or enforce the Convention.

There are four permanent committees of CITES that continue the work generated at the conferences. These are the Standing Committee (policy, financial and follow-up from conferences), the Animals and Plants Committees (technical matters) and the Nomenclature Committee. Their respective remits are set out in Resolution Conf. 11.1.

At the national level, parties are required by Article IX to designate a management authority to be responsible for the administration of CITES and a scientific authority to advise on scientific matters. The former are frequently located in the government department responsible for the environment, although some countries place them in their agricultural or forestry departments or, occasionally, elsewhere.

Content of the Convention

The text of the Convention is readily available from the CITES website (http://www.cites.org/), from the CITES Secretariat, in the literature and elsewhere.

There is also a large body of interpretation and amendments to the Convention that has built up over the years. This takes the form of:

– resolutions that have been passed at the conferences of the parties

– more temporary documentation in the form of Decisions of the conferences that require further action by the CITES Secretariat or the Committees supplement the Resolutions

– notifications through which the Secretariat communicates with the parties.

Copies are available on the CITES website or in paper form from the CITES Secretariat.

This material is not always easy to consult and there are various publications that may provide assistance, such as those published by Lyster (30) and van Heijnsbergen (43). The most comprehensive publication has been presented by Wijnstekers (44). This commentary on the Convention is based on long experience of the documentation and development of the treaty and is a valuable guide. Governments often provide information on the implementation and administration of the treaty at the national level. Such material is usually obtainable within the country and may also be accessible on the internet (particularly the government website) or from the overseas diplomatic missions. Supplementary information, particularly on the practical application of CITES, is often available from the many non-governmental organisations (NGOs) concerned with wildlife, environmental or animal welfare issues.

The title and basic concepts of the Convention

There are certain basic concepts essential to an understanding of CITES and these relate particularly to the application and interpretation of the terms used in its title 'The Convention on International Trade in Endangered Species of Wild Fauna and Flora' and these are considered below.

International

This international treaty applies to the transfrontier movement of CITES species and not to movement within a country.

Trade

The word trade normally connotes a commercial transaction. However, its use in CITES, in effect, applies to any international movement of the relevant species, whether for commercial purposes or not. 'Movement' is a more appropriate word but the usage in CITES is 'trade' and, in Article I (c) of the Convention, this is defined as 'export, re-export, import and introduction from the sea'.

Endangered species

Member countries of CITES are required to regulate the international movement of endangered species. CITES itself applies only to the species that are listed in the Appendices to the Convention even if they are considered endangered by other criteria or legislation, such as the IUCN *Red List* (24). The current lists are published on the CITES website.

Fauna and flora

Member countries of CITES are required to regulate the international movement of endangered species of fauna and flora. The provisions relating to plants are comparable to those for animals but are irrelevant to this chapter. Nevertheless, this information can be found in most of the sources mentioned in this text in relation to CITES.

The Appendices

There are three Appendices (I, II and III) attached to CITES and they list the species to which the Convention applies. Article II of the Convention sets out the broad criteria for allocating species to the Appendices (Table IV).

Parts and derivatives

A very large part of the CITES trade relates not to live animals but to derived products, both raw and processed, such as trophies, ivory, coral and ingredients of traditional medicines. The Convention expressly applies not only to live animals but also to dead ones. It also applies to parts and derivatives of CITES species that are 'readily recognizable', Article I (b). This is defined by Resolution Conf. 9.6 'to include any specimen which appears from any accompanying document, the packaging or a mark of label, or from any other circumstances, to be a part or derivative of an animal or plant of a species included in the Appendices…'.. To deal with certain problems that have arisen in the past, the Resolution recommends parties not to waive permits unilaterally by deeming that certain parts or derivatives are not 'readily recognizable' and to assume products of ranching operations to be 'readily recognizable'.

Table IV
Appendices to the Convention on International Trade in Endangered Species of Wild Fauna and Flora

Appendix	Description	Trade	Article
I	'… all species threatened with extinction which are or may be affected by trade'	Strictly regulated, permitted only in exceptional circumstances	II.1 Resolution Conf. (RC) 5.10
II	'all species which although not necessarily now threatened with extinction may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with their survival' other species where necessary for control of the above, e.g. 'look-alike', species	Regulated	II.2.(a) RC 9.24 II.2. RC 9.24
III	'all species which any party identifies as being subject to regulation within its jurisdiction for the purpose of preventing or restricting exploitation, and as needing the co-operation of other parties in the control of trade'	Regulated	II.3 RC 9.25 RC 7.12
I, II, III	'Species' includes 'any species sub-species or geographically separate population thereof'. 'Specimen' includes: – live and dead animals – 'readily recognizable' parts or derivatives of: any species listed in Appendices I and II any item specified in Appendix III Appendices I and II can include hybrids: – forming distinct and stable populations in the wild – having Appendix I,II specimens in their recent lineage		I.(a) I.(b) RC 9.6 RC 10.17

Stricter national measures

The Appendices are constantly reviewed and are amended at each Conference of the Parties in accordance with Article XV and XVI, the criteria (relating to the biological and trade status of a species) that are laid down in Resolution Conf. 1.3, Resolution Conf. 9.24 and Resolution Conf. 9.25. Individual parties may unilaterally include other animals or accord higher status to some CITES species in their national legislation because Article XIV.1. (a), read with Resolution Conf. 6.7, permits parties to apply stricter domestic measures than those of CITES. Thus, the annexes to the Regulation that implements CITES in the EU apply to many more species than do the Convention Appendices to which they correspond. Many Appendix II species are included in the Annex A of the Regulation that equates to Appendix I status.

Regulation of the movement of species

The movement of CITES species across international frontiers must be authorised by CITES permits issued by the countries involved. The permit requirements are set out in Table V.

Table V
Permits required to authorise the movement of species defined by the Convention on International Trade in Endangered Species of Wild Fauna and Flora

Appendix	Article	Import/export	Prior granting and presentation of documents required
I	III.2	Export	Export permit
I	III.4	Re-export	Re-export certificate
I	III.3	Import	Import permit and export permit or re-export certificate
I	III.5	Introduction from the sea	Certificate
II	IV.2	Export	Export permit
II	IV.4	Import	Export permit or re-export certificate. Many countries also require an import permit as in Appendix I
II	IV.5	Re-export	Re-export certificate
II	IV.6	Introduction from the sea	Certificate
III	V.2	Export	Export permit
III	V.3	Import	Certificate of origin (or export certificate)
III	V.4	Re-export	Certificate

Permit procedures for samples

While the permit procedure is considered essential to the control of parts and derivatives of CITES species, there has been concern about a number of difficulties and delays in the permit procedure that arise when samples taken from CITES animals have to be sent to another country. Delay in the case of certain types of sample, particularly those used for veterinary diagnostics and treatment, health monitoring (that may be required, for example, by the IUCN Guidelines on re-introductions and translocations) (Table III) or law enforcement, can be detrimental to the species that CITES is intended to protect. Samples are rendered useless when they deteriorate or the animal dies before the permits are issued (12). Likewise, some samples taken from CITES species are sent abroad in such large numbers (e.g. for DNA analysis or for biomedical research) that they take up an undue proportion of resources of the management authority although they are not concerned with wild populations at risk. This issue was debated at the Eleventh Conference of the Parties held in Nairobi in 2000 (13). As a result, the Animals Committee and Standing Committee were directed to identify the types of samples and the circumstances and purposes that should be facilitated. These are non-commercial, time-sensitive samples taken for reasons such as veterinary diagnostics and treatment, health monitoring and law enforcement, including DNA and other forensic samples. Recommendations are to be made to the next Conference of the Parties for procedures, possibly based on 'fast-track' systems for the issue of permits that are already in use in some countries such as the United Kingdom (UK) (16) and the USA, that could be adopted by the parties. The documentation on this subject, including Decisions 11.87, 11.88 and 11.103-11.105 and the Secretariat document SC45Doc.10 (Rev.1), is available from the CITES website.

Criteria for permits

When a management authority issues a permit, the criteria set down in Article III of the Convention must be met. These relate to the protection of wild populations, restriction of commercial trade and to the welfare of live animals while subject to the permit. The provisions are set out in Table VI and reference is made to the considerable amount of interpretation provided in resolutions.

Table VI
Criteria for permits issued by the Convention on International Trade in Endangered Species of Wild Fauna and Flora

Appendix	Authorisation	Article	Conditions of issue
I	Export	III.2 RC 8.9 RC 10.21	Not detrimental to the survival of the species Not obtained in contravention of national laws Prepared and shipped to minimise the risk of injury, damage to health or cruel treatment Import permit has been issued
	Re-export	III.4	Imported in accordance with Convention Prepared and shipped to minimise the risk of injury, damage to health or cruel treatment Import permit has been issued
	Import	III.3 RC 5.10	Not detrimental to the survival of the species Proposed recipient is suitably equipped to house and care for the live import Not to be used for primarily commercial purposes
	Introduction from the sea	III.5	Not detrimental to the survival of the species Proposed recipient is suitably equipped to house and care for the live import Not to be used for primarily commercial purposes
II	Export	IV.2	Not detrimental to the survival of the species Not obtained in contravention of national laws Prepared and shipped to minimise the risk of injury, damage to health or cruel treatment Exports and permits to be monitored for trade levels
	Re-export	IV.5	Prepared and shipped to minimise the risk of injury, damage to health or cruel treatment Imported in accordance with Convention
	Import	IV.4	None, but a comparable document is often required
	Introduction from the sea	IV.6	Not detrimental to the survival of the species Not obtained in contravention of national laws Prepared and shipped to minimise the risk of injury, damage to health or cruel treatment
III	Export	V.2	Not obtained in contravention of national laws Prepared and shipped to minimise the risk of injury, damage to health or cruel treatment Exports and permits to be monitored for trade levels
	Re-export	V.4	None
	Import	V.3	None, but a comparable document is often required

Format of permits

Article VI and Resolution Conf. 10.2 set out rules for the content, standardisation and acceptance of CITES permits. Security measures are incorporated in the permits and parties are required not to issue permits retrospectively or for illegally-acquired CITES specimens. Permits are also required for trade in CITES species with States that are not parties to the Convention. Article X and Resolution Conf. 9.5 require that such permits are based on criteria comparable to those of CITES permits.

Exceptions to the requirement for permits

Article VII provides a number of exceptions to the general requirement that a CITES specimen may only be moved internationally in accordance with a CITES permit or certificate (Table V). Circumstances in which permits or certificates are not required for the international movement of CITES specimens are summarised in Table VII.

Table VII
Specimens that may be moved internationally without documentation from the Convention on International Trade in Endangered Species of Wild Fauna and Flora

Article	Circumstances	Resolution Conf. Ref.
VII.1	Transhipped under customs control	
VII.2	Acquired before the Convention came into force	5.11
	Personal and household effects	2.11 10.6 10.20
	Non-commercial movement of preserved museum specimens	11.15
	Registered travelling exhibitions such as zoos and circuses moving captive-bred or pre-convention specimens	8.16
VII.4 VII.5	Special provisions for the authorisation for specimens of captive-bred species	8.15 10.16 11.14 11.16

The parties tend to view these exceptions to the CITES permit controls as loopholes that may facilitate illegal trade or add to the difficulty of enforcement. Consequently, the Article has been extensively and restrictively interpreted by the parties in the Resolutions listed in Table VII.

Commercial and non-commercial purposes

The Convention provides, in Article II.1, that Appendix I permits are to be very strictly controlled and only authorised in exceptional circumstances. As a result, particular attention has been given to the provision that they should be granted only when the movement is for 'primarily non-commercial purposes'. This has been extensively interpreted by Resolution Conf. 5.10 which provides that the term 'commercial' applies to anything producing an economic benefit. It also requires that if the non-commercial purposes do not predominate, then an activity should be assumed to be primarily commercial and, moreover, that permits should not be issued unless the applicant can show that the purpose of a proposed import is clearly non-commercial. The Resolution discusses a number of examples where this has to be applied to aspects of CITES having a partially commercial element, such as biomedical specimens, captive-breeding programmes and importation through commercial dealers for non-commercial purposes.

Permitted trade in Appendix I species

Although the purpose of the Convention is to regulate the trade in CITES species, it does not prohibit it altogether. Article VII.4 reduces the permit requirements for Appendix I captive-bred specimens. When read with Resolution Conf. 10.16, it allows Appendix I specimens that have been bred in captivity for commercial purposes to be treated as Appendix II species, thus permitting them to enter trade. In addition, under Article VII.5, specimens bred in captivity for non-commercial purposes can be moved under a CITES certificate, although in the case of Appendix I species this is restricted by Resolution Conf. 11.14 to conservation programmes in very limited circumstances.

Species are bred in captivity in many circumstances and for a variety of purposes, both commercial (i.e. for gain and economic benefit [Resolution Conf. 11.14]) and non-commercial (e.g. scientific, conservation, exhibition). CITES recognises that properly controlled trade and sustainable use can protect and benefit wild populations of endangered species (Resolution Conf. 8.3). Thus, the IUCN Crocodile Specialist Group (CSG) considers that many species of crocodile have been saved from extinction by permitting the breeding in captivity, sustainable use and trade in crocodiles and their products.

Specific provision is made by CITES for the captive breeding (i.e. breeding in a controlled environment, normally without the introduction of wild stock, as defined in Resolution Conf. 10.16) of CITES species. This is subject to strict limitations for authorisation of captive breeding operations, identification and permits.

Operations for the captive breeding of Appendix I species for commercial purposes have to meet the criteria set out in Resolution Conf. 10.16 and Resolution Conf. 11.14.

In the case of some species (for example, crocodiles), CITES has transferred specific populations of Appendix I species to allow for the ranching (i.e. 'rearing in a controlled environment of specimens from the wild') and trading of such species. The criteria for such transfers by the Conference of the Parties are set out in Resolution Conf. 11.16 (and, in respect of crocodiles, Resolution Conf. 8.22). Specific requirements for marine turtles are provided by Resolution Conf. 9.29.

Trade in a strictly limited number of wild-caught specimens or their products under a quota system is permitted. Resolution Conf. 10.10 relates to quotas for leopard skins and Resolution Conf. 10.14 to elephant products.

Identification

The identification of livestock and items in trade is a critical aspect of monitoring the legality of captive-breeding and the resulting trade.

To assist with the enforcement of CITES, Article VI.7 permits specimens that are being moved internationally, particularly live animals, to be identified or marked by a management authority by some means and recommends that the method used is as tamper-proof as possible. Resolution Conf. 11.14 requires the secure and appropriate marking of breeding stock (and the products to be traded) in registered operations for the captive breeding of Appendix I species; Resolution Conf. 10.16 recommends that trade in captive-bred specimens of species on any Appendix should only be permitted if they are marked in accordance with the Resolutions on marking. Resolution Conf. 7.12 recommends that the marking of live animals should take into consideration 'the humane care, well-being and natural behaviour' of an animal. With respect to parts and derivatives of ranched or captive-bred animals, tags or stamps provided by the Secretariat should be used. Specific requirements for the tagging of crocodile skins are given in Resolution Conf. 11.12.

Resolution Conf. 8.13 recommends the use, where possible, of microchip transponders for the identification of live animals covered by CITES. The Resolution recommends that parties follow the information and advice on the use of the transponders provided by the IUCN/SSC Captive Breeding Specialist Group (website: www.cbsg.org). Other organisations have recommended different implantation sites in some circumstances and a summary of this information for veterinarians involved in such work is given in the *Guidelines for microchip transponder sites in exotic species* (2). Resolution Conf. 10.2 requires the details of the identification to be recorded on the CITES permits issued in respect of an Appendix I animal.

Welfare

Over the years, concern has been shown regarding the ill-treatment that accompanies some of the trade in CITES specimens. Attempts have been made to persuade the parties to extend their responsibility for welfare back to the point when an animal is captured in the wild. However, the Parties have kept to a strict interpretation of the more limited requirements of the Convention (4).

While the Convention has no general provisions relating to animal welfare, concern is expressed as follows:

– A condition is imposed upon the issue of certain permits (Table VI) that a management authority must be satisfied that live animals will be prepared, shipped and cared for during transit, holding and shipment (Article VIII.3) so as 'to minimize the risk of injury, damage to health or cruel treatment'. Article VIII.3 also requires parties to minimise delays in passing CITES specimens through trade formalities on entry to and exit from a country.

– Resolution Conf. 10.21 on the Transport of Live Animals requires parties to apply the CITES Guidelines on transport (8) and the IATA Regulations to the movement of live animals under CITES permits and also to incorporate the IATA Regulations into national legislation. The Resolution also encourages parties to provide holding facilities at ports of entry and exit, inspection by CITES-designated personnel and the keeping of records of mortalities that occur during transport.

– Welfare is also shown in the provisions relating to microchipping insofar as Resolution Conf. 7.12 recommends that the marking of live animals should take into consideration 'the humane care, well-being and natural behaviour' of an animal and an assurance is required from those who apply for the registration of a captive breeding operation for Appendix I species in Resolution Conf. 11.14 that they will comply with this standard.

Enforcement

Enforcement is primarily the responsibility of the parties at the national level. Article VIII.1 requires them to prohibit trade that does not conform with the Convention and to take 'appropriate measures' to enforce the Convention. These must include the provision of penalties and for the confiscation, or return to the country of origin, of illegally traded specimens. The disposal of confiscated specimens is dealt with in Resolution Conf. 10.7 which also includes detailed guidelines for live animals that follow those developed by the IUCN (Table III).

The effectiveness of the enforcement of CITES has been studied in detail by Reeve (39) and individual cases from many different jurisdictions are regularly reported in the TRAFFIC *Bulletin*. These enforcement activities are complex and expensive and require specialist knowledge of endangered species (particularly in respect of identification and behaviour) as well as the skills that are needed for any criminal investigation. The need for expertise and resources by police, customs and other enforcement authorities and the lack of international collaboration has made it difficult to provide effective enforcement for CITES. However, the governments of some countries have, in recent years, recognised the importance of this legislation and of endangered species. The high value of the trade in some species, their parts and derivatives and connections with other forms of illegal international trafficking has led to increased levels of enforcement. In some areas, there has been a move towards strengthening the collaboration, on national and international levels, between a range of bodies interested in law enforcement, species protection and the welfare of animals.

One of the key factors in effective trade monitoring and enforcement is information. Articles VIII.7 and VIII.8 (and

following the recommendations of Resolution Conf. 11.17) require that CITES parties produce and publish reports on the legislative, regulatory and administrative enforcement action taken in their countries. TRAFFIC (provided by the World Wildlife Fund and by the IUCN) monitors CITES trade and the TRAFFIC *Bulletin* publishes data on the trade status of, and threats to, CITES species. The *Bulletin* also includes numerous reports of prosecutions for illegal trade and CITES enforcement activities from all parts of the world.

Resolution Conf. 11.3 contains specific, newly-revised, recommendations for the standards of enforcement to be effected by parties, including strict compliance, prompt action under Article VIII.1, exchange of information on illegal movement and on enforcement actions, strict control of permits and reporting infringements to the Secretariat. There are provisions for enhancing the role of the Secretariat in enforcement, including the secondment of national expertise in enforcement (which has been taken up by the UK) and the provision of training to parties. The Secretariat is required to seek co-operation with international enforcement agencies, such as Interpol and the World Customs Union. Parties are recommended to improve enforcement by encouraging local communities to become involved in the management of their wildlife, by making use of non-governmental expertise and by considering the development of specialist teams for wildlife law enforcement.

These concepts are already being put into practice to some extent. In many countries there are projects for community wildlife management. In the UK, collaborative action is well established. Arising from an initiative started in 1994, joint meetings for government, police, customs and NGOs on the subject of wildlife law enforcement (including CITES) are held annually (18). A seminar is organised by a government-sponsored coalition of such bodies known as the Partnership against Wildlife Crime (PAW) which is also active in the improvement of the quality of wildlife law enforcement and has working groups on specific topics such as forensics, training and access to information (38). CITES, wildlife protection, animal welfare, animal health, customs and other offences are often interrelated and an illegal incident may involve a number of these areas of law (15, 17, 20). With this in mind, the Government of the UK has also established a National Wildlife Crime Unit which specialises in all aspects of wildlife law enforcement.

Wildlife movement and trade as a wildlife conservation problem

The movement of wildlife around the globe has had serious consequences for the maintenance, integrity and diversity of natural ecosystems and some of their constituent species (31). These consequences range from the decimation of the natural fauna and flora of areas in countries such as Australia and New Zealand, due to intentional introductions and the accidental spread of wildlife such as rabbits, foxes, possums, deer, mustelids, and cats, or the accidental introduction of rats (6, 7) to the devastating effects of inadvertent disease (40), such as the introduction of avian malaria into Hawaii which devastated native bird species (10, 46).

Of the four major causes of the loss of natural biodiversity, modification and loss of habitat is by far the most important driver of the extinction crisis (19). However, the introduction and spread of invasive species is not far behind in its destructive power and has been recognised as having a significant impact on a number of species and habitats (24). Direct exploitation and overuse of wild species have also compounded other factors and contributed to species extinctions as in the case of the dodo (*Raphus cucullatus*) and are still affecting many species (6). With burgeoning human populations, globalisation, the emphasis on free trade and the growth in the volume of trade and tourism, the impact of invasive species and direct over-exploitation must be carefully guarded against.

The effects of wildlife movements on the natural world are varied. For example, movement of specimens for trade purposes can produce a direct impact on the species in question by reducing numbers in the wild. Collection for the pet trade is blamed for reducing the wild populations of Spix's Macaw (*Cyanopsitta spixii*) to a single specimen, which is now extinct in the wild (41). On the other hand, although the target species may not be directly threatened by the levels of trade it may be in danger of becoming threatened if the trade is not strictly regulated. These two cases of direct threats to endangered species or of the need for regulation to avoid the status of the species deteriorating, are dealt with by including the species in the CITES Appendices.

In addition to the direct impact of harvest, movement of wildlife can increase the risks of disease transmission both to the animal being transported and to local wildlife populations. In the UK, the transport of domestic animals infected with foot and mouth disease has raised concern about transmission of the disease to wildlife populations (5). Similarly, the release of wildlife species which have been held in captivity can lead to the transmission of diseases to wild (i.e. free-living) populations and there is particular concern that the practice of releasing tortoises from so-called 'rescue centres' may expose wild tortoise populations to unusual types or challenges of infectious disease (25). Many countries have strict quarantine laws to restrict the spread of disease, although in some areas, customs and quarantine practices may be inadequate to safeguard species. The quarantine procedures are dealt with in the appropriate sections of this chapter.

Finally, the movement of wildlife may have direct effects on other species in the ecosystem generally through predation, but sometimes through competition for particular resources. The

accidental introduction of the brown tree snake (*Boiga irregularis*) to Guam has decimated natural populations of birds on the island as they are not able to deal with such levels of snake predation (6). The unplanned movement and introduction of new individuals to a population may also affect the population structure of the species in question. All such results of animal movements are of concern to the wildlife conservation community and IUCN has developed a number of policy and guidance documents which may be useful to veterinarians and others faced with the intricacies of supervising wildlife movements.

Development of World Conservation Union Policy Guidelines relevant to animal movements and trade

The World Conservation Union, or IUCN, is a unique world partnership which was founded over 50 years ago to provide a forum for States, government agencies, NGOs and individual experts to meet and discuss matters of mutual conservation concern (1). Currently, the IUCN has almost 1,000 member organisations (79 States, 112 government agencies, 760 NGOs, and 37 affiliates). In addition to these, the IUCN is dependent on the work of six volunteer commissions, composed of some 10,000 individuals recognised for their expertise. To conduct the work of the IUCN, the membership is supported by a global secretariat which has its headquarters in Switzerland, with 42 regional and country offices around the world. Every three to four years, the entire IUCN, composed of its members, commissions and secretariat, meets to prioritise issues of concern and to approve the future work plan.

In 2000, the IUCN developed a new vision of a just world that values and conserves nature and adopted a four-year programme to address a series of key issues and drivers. The programme is based on the IUCN mission to influence, encourage and assist societies throughout the globe to conserve the diversity and integrity of nature and to ensure that where use of natural resources occurs, it is ecologically sustainable. The underlying philosophy for environmental conservation and management is stated in key documents such as *Caring for the Earth* (45) and the *Global Biodiversity Strategy* (47). These cover broad themes including the need for community involvement and participation in sustainable natural resource conservation, an overall enhanced quality of human life, and the need to conserve and, where necessary, restore ecosystems. The IUCN is a science-based organisation that synthesises information to develop policy guidelines, a number of which are relevant to considerations of the regulation of disease and of the movement of wild animals. The majority of the scientific input for these guidelines has come from the largest of the six commissions, the Species Survival Commission (SSC). The seven thousand or so members of this Commission are arranged into specialist groups (SGs) along taxonomic (e.g. Canid and Caprinae SGs) and interdisciplinary (Veterinary SG, the Invasive Species SG and the Sustainable Use SG) lines.

The SSC has been responsible for developing, in consultation with others, a number of policies and guidelines relevant to the movement of wild animals (Table III). The remainder of this section examines the individual policy documents, highlighting aspects that appear particularly relevant to the work of veterinarians. These policy documents, together with further information on the IUCN and on the individual specialist groups of SSC can be found on the IUCN website (www.iucn.org).

In addition to the documents introduced here, the IUCN is also renowned for the production of the so-called *Red Lists of Threatened Species* (24). A major task of the SSC SGs is the review of the conservation status of species to assess their risk of extinction against a set of quantitative categories and criteria. These Red List Assessments have no legal standing internationally (although some countries have enshrined them in their national legislation) but serve to alert the international community, to assist in the prioritisation of conservation action. Although the quantitative criteria for the IUCN *Red List* were originally developed along side the CITES criteria, the two sets serve very different purposes and differ in their substance and application.

World Conservation Union Invasive Alien Species Guidelines

For millennia, the natural barriers of ocean, mountain, river and desert have provided the isolation required for unique species and ecosystems to evolve. However, in just a few hundred years, these barriers have been breached by major global forces that have combined to help 'alien' species travel to new habitats and become invasive. The term 'invasive alien species' refers to species occurring outside both their natural range and their dispersal potential which then become established in natural habitats as agents of change which threaten native biological diversity. The cost of these biological invasions can be enormous, in both ecological and economic terms. Alien invasive species are found in all taxonomic groups and include viruses, fungi, algae, mosses, higher plants, invertebrates, fish, amphibians, reptiles, birds and mammals. They have invaded and affected native biota in virtually every ecosystem on earth. Hundreds of extinctions have been caused by alien invasive species (29, 46). The goal of the IUCN guidelines is to prevent further losses of biological diversity due to the deleterious effects of alien invasive species. These guidelines do not, however, address the issue of genetically modified organisms (GMOs) although many of the principles stated here could apply to trade in GMOs. The guidelines do, however, address four substantive concerns of the biological invasion problem, as follows:

– improving understanding and awareness

– strengthening the management response

– providing the appropriate legal and institutional mechanisms

– enhancing knowledge and research efforts.

The guidelines have the following aims:

– raise awareness of the problem of alien invasive species affecting biodiversity in the developed and developing worlds

– encourage the prevention of alien introductions

– minimise the number of unintentional introductions and prevent unauthorised introductions of alien species

– ensure that intentional introductions are fully evaluated in advance with full regard to potential impacts on biodiversity

– encourage eradication and control campaigns to deal with alien species

– encourage the development of national legislation and international co-operation to deal with the invasive alien species problem

– encourage necessary research to address the problem.

Particular areas where the veterinary profession could take action include the following:

– Improving understanding and awareness of the problem amongst veterinarians and all those involved in the movement of wildlife, remembering that the target animal may in fact be acting as a reservoir or vector for the movement of invasive alien species. Host animals may transmit parasites and other pathogens to the native fauna, particularly into ecologically vulnerable habitats, if not closely tested and supervised. The ease of transmission to both related and perhaps more importantly although less obviously, unrelated taxonomic groups, must be assessed.

– Preventing introductions of alien invasive species, as this is the cheapest, most effective and most preferred option for minimising the problem. Veterinarians called on to work on the movement of known invasive species should determine what national regulations are in place concerning such introductions and should always work with the appropriate authorities to ascertain that a full environmental impact assessment and risk assessment have been undertaken which show that the positive effects on the environment outweigh the actual and potential adverse effects.

– Promoting awareness that the effects of alien species can be direct, indirect, cumulative and/or complex, often unexpected, surprising, and counter-intuitive. An alien species may be 'dormant' and show no signs of being invasive for years or decades, and then become invasive. (14). Cumulative interactions (over time) with other alien species can trigger changes in ecology which may well trigger potential invasiveness (e.g. interaction between alien pathogen and alien vector). These complexities have led to the advice that 'Every alien species needs to be managed as if it is potentially invasive, until convincing evidence indicates that it presents no such threat, as part of the Global Invasive Species Programme (GISP) Global Strategy' (32).

Unintentional introductions are extremely difficult to control. The most practical means of minimising such introductions is to identify, monitor and regulate the pathways and trade routes by which they occur. Important pathways include national and international trade, tourism, shipping, ballast water, fisheries, agriculture, construction projects, ground and air transport, forestry, horticulture, landscaping, the pet trade and aquaculture. Some of these pathways may be more relevant to the work of veterinarians than others, but nonetheless, the profession would do well to be aware of the possible transmission routes and to consider the development of collaborative guidelines and codes of conduct, which minimise or eliminate unintentional introductions. Quarantine and border regulations should not only focus on narrow economic grounds that relate primarily to agriculture and human health, but should also consider the unique biosecurity threats that face each country.

Veterinarians are well placed to work with the appropriate institutions to promote a mechanism, such as a biosecurity agency, that will consider all organisms likely to be introduced and their effect on the environment. Many veterinarians will be familiar with the traditional orientation towards agriculture, but with globalisation, the exotic pet industry is growing rapidly and encompassing an entire range of organisms as companion animals, not dreamed of even twenty years ago by the mass market. The red-eared slider (*Trichemys scripta*) is now a major pest in many parts of the globe including Europe and South-East Asia, where it is causing huge damage to natural wetland ecosystems. In addition to the introduction of the organism itself, there are also concerns about the effects of its parasites and pathogens.

The IUCN guidelines make recommendations on the conduct of eradication programmes or control strategies to deal with invasive alien species and note that such programmes can improve the likelihood of subsequent re-introductions being successful. They also acknowledge that dealing with game and feral species can be controversial due to positive cultural values associated with these species on account of the hunting and fishing opportunities they provide and give suggestions on how to deal with such cases. Finally, the guidelines also contain recommendations on the development of databases, research and national and international legislation and institutions to address the problem. An appendix that may be of use to veterinarians contains recommendations about conducting environmental impact assessments (EIA), disease risk assessment and the criteria to be used to achieve the eradication of alien invasive species.

In addition to the full text of the guidelines, further information can be obtained from the Invasive Species Specialist Group which has an extensive international network, a database of invasive species and publishes a newsletter: *Aliens* (website: www.issg.org).

World Conservation Union Re-introduction Guidelines

The IUCN SSC Guidelines for Re-introductions have been developed in response to the increasing occurrence of re-introduction projects world-wide to help ensure that the projects achieve their intended conservation benefit and do not cause adverse side effects. The guidelines were designed to encompass the full range of animals and plant taxa, but future plans include the development of more specific handbooks for individual animal groups. Many of the points in the guidelines are more relevant to re-introductions using captive-bred species than to translocations of wild species. Others are especially relevant to globally endangered species with limited numbers of founders. The guidelines deal with (and define) the following types of animal movement and population manipulation:

– re-introductions: an attempt to establish a species in an area which was once part of its range, but from which it has become extinct

– translocations: a deliberate movement of animals from one part of their range to another

– re-inforcement/supplementation: the addition of individuals to an existing population of conspecifics

– conservation/benign introductions: an attempt to establish a species for the purpose of conservation outside its recorded distribution but within an appropriate habitat and eco-geographical area. This is only feasible when no historical habitat remains in the species recorded range.

According to the guidelines, the aim of a re-introduction should be to establish a viable free-ranging population of a particular taxon that has become globally or locally extinct, or extirpated in the wild. The re-introduction should take place within the former natural habitat and range of the species and should require minimal long-term management. The guidelines make it clear that any re-introduction should involve a multidisciplinary team, including veterinarians. They also recommend that before the project takes place, a full feasibility study and background search is conducted. These studies will investigate why the species declined in the wild and will collect information on all aspects of the natural history and genetic make-up of the species. An understanding of the effect that the species will have on the ecosystem is important to determine the likely success of the re-introduced population. The guidelines also consider the selection of the release site and stress that for a re-introduction, there should be no remnant population – this is to prevent disease spread, social disruption and the introduction of alien genes to any remnant individuals. The area should have assured long-term protection. In addition, most species rely on individual experience and learning about the distribution of food and shelter and social interactions in order to survive. Consequently, the introduced animals must be given the opportunity to acquire the necessary information, though training and care must be taken to ensure that they do not become habituated to humans and thus a danger to themselves and the humans.

Veterinary input will be needed for the evaluation of the re-introduction site to ensure that factors in the original decline of the species, such as disease, pollution and poisoning, are no longer in evidence. The availability of suitable release stock must also be taken into account, although re-introductions should not be carried out merely because captive stocks exist or as a means of disposing of surplus stock. It is desirable that source animals come from wild populations, be closely related genetically to the original native stock and show similar ecological characteristics (morphology, physiology, behaviour and habitat preference) to the original sub-population. If captive stock is to be used, it must be from a population that has been soundly managed, both demographically and genetically, according to the principles of conservation biology.

The guidelines warn that prospective release stock must be subjected to thorough veterinary screening. Any animals found to be infected, or which prove positive on testing for non-endemic or contagious pathogens with a potential impact on population levels, must be removed from the consignment and the uninfected negative remainder must be placed in strict quarantine for a suitable period before being re-tested. If pathogen-free after re-testing, the animals may be placed for shipment. Since infection with significant pathogens can be acquired during transportation, especially if this is inter-continental, great care must be taken to minimise this risk. Stock must meet all health regulations prescribed by the veterinary authorities of the recipient country and adequate provisions must be made for quarantine if necessary. In addition, health monitoring ('screening') should be undertaken for the closely related species in the re-introduction area. Measures should be taken to ensure that the release stock will not be exposed to reservoirs or vectors of pathogens which may be present at the release site and to which they may have no acquired immunity. If vaccination is deemed appropriate prior to release to protect the stock against local endemic or epidemic diseases of wild stock or domestic livestock at the release site, this must be performed so as to allow sufficient time for the development of the required immunity. Provision must be made for the continued monitoring of the health of the individuals once they are at the release site and policies on subsequent veterinary intervention decided.

The importance of veterinary screening to the success of re-introduction projects is demonstrated in a review by Beck *et al.* (3). Of the 145 projects, only 16 could be considered a complete success (which was measured as 500 free-ranging, i.e. free-living, animals in the population), although several projects had partial success and some were in the early stages of re-introduction. Interestingly, a lack of medical screening protocols both before, during and after release, was identified as a serious shortfall in many of the projects.

In addition to the full text of the guidelines, further information can be obtained from the Re-introductions Specialist Group which has an extensive international network, a database of re-introduction projects, a library of materials relating to re-introductions and publishes a bi-annual newsletter entitled *Re-introduction News* (website: www.iucn.org/themes/ssc/programs/rsg.htm).

World Conservation Union Statement on Translocations of living organisms and Policy on State Gifts of animals

Since its adoption in 1987, much of the Statement on Translocations has been updated in the more recent guidelines on re-introductions and on dealing with invasive alien species. However, one point is as pertinent today as ever, namely: translocations are powerful tools for conservation, but have the potential to cause enormous damage if misused. Biological control and the movement of micro-organisms are both considered in the statement on translocations which recognises the increased incidence of such measures and urges great caution and full assessment of the risks and benefits associated with such techniques. In addition, the Policy on State gifts although adopted some time ago, is relevant to veterinarians. The policy states that 'gifts of living animals of threatened species such as those recognised by IUCN as critically endangered, endangered or vulnerable, should only occur if they are completely compatible with conservation programmes for the species involved and must of course be subject to national and international laws and veterinary health procedures'.

World Conservation Union Guidelines for the placement of confiscated wild animals

These IUCN guidelines expand on CITES Resolution Conf. 10.7 which deals only with the disposal of confiscated live specimens of species included in CITES regulated international trade. Live wild animals are confiscated by local, regional and national authorities for a variety of reasons. Once authorities have taken possession of these animals, the challenge is then to dispose of the animals in a timely and efficient manner. The IUCN Guidelines outline three options for the disposal of such animals in the conservation context, as follows:

a) to maintain the animals in captivity for the remainder of their lives

b) to return the animals to the wild

c) to euthanise the animals, or to destroy them humanely.

Returning animals to the wild is often the most popular option, but poses real risks and generally confers few conservation benefits. Potentially, the most serious risks are those of spreading diseases and of modifying the population gene pool by releasing animals with a different genetic make-up. The confiscated animal is likely to have been held in a holding facility either with other wild animals or with domestic stock and so will probably have been exposed to disease and parasites. If returned to the wild, these animals may infect others, thus causing serious and potentially irreversible problems. There are also a number of considerations relating to the welfare of the animals in question; for example, confiscated animals are often released outside their natural range and may be unable to survive due to a lack of appropriate food and shelter. In addition, the animal may not be able to re-gain its social and ecological niche or may even have been removed as a juvenile and so not have learned all the appropriate skills for survival in the wild.

The release of confiscated specimens to the wild, if it is to be consistent with conservation principles and practice, should only be made in cases where the animals are of high conservation value and/or the release is part of a management programme. Releases outside the natural range of the species should only be made if such action is in accordance with the IUCN Guidelines for Re-introduction for a conservation introduction. Any animals selected for release must be subjected to the highest level of screening and monitoring to address potential negative impacts, such as disease transmission.

Retaining confiscated animals in captivity is generally the preferable alternative to returning them to the wild, but also has associated risk and costs. On the negative side, confiscated animals are likely to have been exposed to disease and parasites, which could be transmitted to other captive stock. Finding a long-term placement for the animals can be time-consuming and expensive and the transfer of ownership can also raise complicated legal and ethical issues; for example, sale may be considered to stimulate demand for these animals and to condone illegal trade. On the positive side, maintenance of confiscated animals in captivity can contribute to public awareness of conservation issues and provide breeding stock for a variety of uses.

The Guidelines note that euthanasia must be considered as a viable alternative to release and maintenance in captivity. In many cases, euthanasia offers the most humane alternative for dealing with confiscated wild animals. It eliminates the genetic, disease and ecological risks that release may pose to wild populations and ecosystems. To guide users through this difficult process of dealing with confiscated living animals, the Guidelines present a decision-tree that presents the options and is supported by detailed explanatory text.

World Conservation Union policy on captive breeding

This policy is being revised to focus on '*ex situ* conservation' as opposed to captive breeding and is likely to be adopted by

IUCN Council in November 2001. Until then, the IUCN policy on captive breeding notes that the establishment of self-sustaining captive populations of species, as well as other forms of intervention, will be needed to avoid the loss of many species through extirpation or extinction. The statement notes that with a view to maintaining or re-establishing viable wild populations, captive populations need to be established well before species are reduced to critically low numbers in the wild. It also stresses that the establishment of such captive populations needs to be co-ordinated internationally according to sound biological principles in order to manage the captive populations for demographic security and genetic diversity, primarily for the benefit of the species. The policy notes that acquisitions for such programmes should not encourage commercial ventures or trade. Whenever possible, captive programmes should be carried out in parallel with field studies and conservation efforts aimed at maintaining the species in its natural environment and should not compete with *in situ* conservation programmes for resources. The statement notes that a wealth of experience is available from zoos and other captive animal facilities, including disciplines such as animal husbandry, veterinary medicine, reproductive biology, behaviour and genetics and that such resources should be mobilised for the most appropriate conservation interventions.

Specialist information and expertise

Further information, advice and expertise relevant to the conservation aspects of this chapter can be obtained from the Conservation Breeding Specialist Group which has an extensive international network, a number of specially developed conservation tools, and publishes a newsletter, *CBSG News* (website: www.cbsg.org). In addition, the Veterinary Specialist Group has an extensive international network and publishes the *Newsletter of the IUCN/SSC Veterinary Specialist Group* (website: www.iucn.org/themes/ssc/sgs/sgs.htm).

Conclusions

Veterinarians and others are likely to be involved with many types of wildlife movements undertaken for a variety of reasons. All those dealing with cross-frontier movements need an understanding of the relevant legislation, not only that relating to animal health but also the CITES provisions. In addition, by noting the advice provided in the IUCN guidelines and participating in the management of animal movements, the veterinary community can contribute significantly to wildlife conservation. Awareness of the needs of animals and the requirements of welfare legislation and guidance is also an important factor in the successful and responsible management of wildlife movements.

■

Réglementation internationale des échanges d'animaux sauvages : la législation et les organisations concernées

M.E. Cooper & A.M. Rosser

Résumé

Les échanges d'animaux sauvages font intervenir un ensemble de textes législatifs relevant de domaines différents du droit. Nombre d'espèces sauvages sont soumises à des restrictions en matière de déplacements internationaux, l'objectif étant d'empêcher la surexploitation de ces populations. Les déplacements de la plupart des espèces animales sont soumis à une législation zoosanitaire rigoureuse afin d'éviter la propagation de maladies infectieuses entre pays importateurs et exportateurs. Le bien-être des animaux dans le cadre des échanges doit être pris en compte et une réglementation pertinente a été instituée à cet effet, surtout pour ce qui concerne le transport. Un certain nombre d'organismes sont impliqués directement sur les échanges ou sur la législation qui régit le commerce international des animaux sauvages.

Mots-clés

Animaux – Bien-être animal – Convention sur le commerce international des espèces de faune et de flore sauvages menacées d'extinction (CITES) – Échanges – Exportation – Faune sauvage – Importation – Législation – Lignes directrices – Santé.

■

Regulación internacional del comercio de animales salvajes: legislación y organizaciones competentes en la materia

M.E. Cooper & A.M. Rosser

Resumen

En el comercio de animales salvajes confluyen ámbitos legislativos muy diversos, correspondientes a distintas ramas del derecho. El movimiento internacional de muchas especies salvajes está sujeto a restricciones destinadas a proteger a sus poblaciones de la sobreexplotación. Con la aplicación estricta de las leyes sobre sanidad animal se intenta prevenir la propagación de enfermedades infecciosas entre países importadores y exportadores. No cabe olvidar tampoco el bienestar de los animales durante las operaciones comerciales, objeto asimismo de disposiciones legislativas referidas especialmente al transporte. Hay varias instituciones que intervienen en el propio comercio o en la legislación que regula los intercambios comerciales de animales salvajes a escala internacional.

Palabras clave

Animal – Bienestar de los animales – Comercio – Convención sobre el comercio internacional de especies amenazadas de fauna y flora silvestres (CITES) – Directrices – Exportación – Fauna salvaje – Importación – Legislación – Sanidad.

References

1. Anon. (1996). – Preface: about IUCN – The World Conservation Union. *In* From care to action: making a sustainable world (M. Holdgate, ed.). Earthscan Publications, London, 388 pp.

2. Anon. (1999). – Guidelines for microchip transponder sites in exotic species. *J. small Anim. Pract.*, **40**, 201.

3. Beck B.B., Rapaport L.G., Stanley Price M.R. & Wilson A.C. (1994). – Re-introduction of captive-born animals. *In* Creative conservation: interactive management of wild and captive animals (P.J.S. Olney, G.M. Mace & A.T.C. Feistner, eds). Chapman and Hall, London, 265-286.

4. Bowman M. (1998). – Conflict or compatibility? The trade, conservation and animal welfare dimensions of CITES. *J. int. Wildl. Law Policy*, **1** (1), 9-63.

5. Brown P. (2001). – Wildlife cull considered in battle for containment. *The Guardian*, 2 March.

6. Caughley G. & Gunn A. (1996). – Conservation biology in theory and practice. Blackwell Science, Oxford, 480 pp.

7. Clout M.N. & Lowe S.J. (2000). – Invasive species and environmental change in New Zealand. *In* Invasive species in a changing world (H.A. Mooney & R.J. Hobbs, eds). Island Press, Covelo, California, 384 pp.

8. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (1980). – CITES Guidelines for transport and preparation for shipment of live wild animals and plants. CITES Secretariat, Geneva, Unipub, 109 pp.

9. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (2000). – Convention on International Trade in Endangered Species of Wild Fauna and Flora. CITES Secretariat, 28 pp.

10. Cooper J.E. (ed.) (1989). – Disease and threatened birds. International Council for Bird Preservation (ICBP)/Birdlife Technical Publication Series No. 10. ICBP/Birdlife International, Cambridge, 276 pp.

11. Cooper M.E. (1989). – Legal considerations in the movement and submission of avian samples. *In* Disease and threatened birds. (J.E. Cooper, ed.). International Council for Bird Preservation (ICBP)/Birdlife Technical Publication Series No. 10. ICBP/Birdlife International, Cambridge, 41-49.

12. Cooper M.E. (2000). – Legal considerations in the international movement of diagnostic and research samples from raptors – a conference resolution. *In* Raptor biomedicine III (J.T. Lumeij, J.D. Remple, P.T. Redig, M. Liertz & J.E. Cooper, eds). Zoological Education Network, Lake Worth, 337-343.

13. Cooper M.E. (2000). – CITES 11th Conference of the Parties – Kenya, 10-20 April. Report on Draft Resolution 11.45.1 on the international movement of samples from CITES species. Wildlife Health Services, Wellingborough, 7 pp.

14. Crooks J.A. & Soulé M.E. (1999). – Lag times in populations of invasive species: causes and implications. *In* Invasive species and biodiversity management (O.T. Sandlund, P.J. Schei & A. Viken, eds). Kluwer Academic Publishers, Dortrecht, 103-125.

15. Department of the Environment, Transport and the Regions (DETR) (1998). – A guide to the European wildlife trade regulations. Global Wildlife Division, Department of the Environment, Transport and the Regions, Bristol, 184 pp.

16. Department of the Environment, Transport and the Regions (DETR) (1998). – Fast track and semi completed permits. *In* A guide to the European wildlife trade regulations. Global Wildlife Division, Department of the Environment, Transport and the Regions, Bristol, 34-35.

17. Department of the Environment, Transport and the Regions (DETR) (2000). – Proceedings of the 1999 National police wildlife liaison officers' Conference, 8-10 October. Department of the Environment, Transport and the Regions, London, 115 pp.

18. Department of the Environment, Transport and the Regions (DETR) (2001). – Proceedings of the 2000 National police wildlife liaison officers' conference, 6-8 October. Department of the Environment, Transport and the Regions, London, 116 pp.

19. Diamond J. (1984). – 'Normal' extinctions of isolated populations. *In* Extinctions (M.H. Nitecki, ed.). University of Chicago Press, Chicago, 191-246.

20. European Commission/TRAFFIC Europe/ World Wildlife Fund (EC/TE/WWF) (1998). – Reference guide to European Community wildlife trade regulation. EC/TE/WWF, Brussels, 125 pp.

21. Food and Agriculture Organization (FAO) (2000). – An appraisal of the suitability of the CITES criteria for listing commercially-exploited aquatic species. FAO Fisheries Circular No. 954. FAO, Rome, 66 pp.

22. Glowka L., Burhenne-Guilmin F. & Sygne H. (1994). – A guide to the Convention on Biological Diversity. The World Conservation Union (IUCN), Gland and Cambridge, 161 pp.

23. Harrop S. & Bowles D. (1998). – Wildlife management, the multilateral trade regimen, morals and the welfare of animals. *J. int. Wildl. Law Policy*, **1** (1), 64-94.

24. Hilton-Taylor C. (2000). – 2000 red list of threatened species. The World Conservation Union (IUCN), Gland, 61 pp.

25. Jacobson E.R. (1994). – Veterinary procedures for the acquisition and release of captive-bred herpetofauna. *In* Captive management and conservation of amphibians and reptiles (J.B. Murphy, K. Adler & J.T. Collins, eds). Society for the Study of Amphibians and Reptiles (SSAR), Ithaca, New York, 109-118.

26. Kennedy K. (1998). – The GATT-WTO system: environmental friend or foe? *J. int. Wildl. Law Policy*, **1** (2), 217-258.

27. Koney E.B.M. & Aning K.G. (eds) (1996). – Harmonising the movement and disease control regulations guiding international livestock and poultry trade. *In* Proc. West African Commonwealth Veterinary Association (WACVA), Ghana Veterinary Association Conference, 24-27 September, Accra. WACVA, Accra, 25 pp.

28. Lesser W. (1998). – Sustainable use of genetic resources under the Convention on Biological Diversity. CAB International, Wallingford, 218 pp.

29. Lowe S., Browne M., Boudjelas S. & De Poorter M. (2000). – 100 of the world's worst invasive alien species. A selection from the Global Invasive Species Database. Invasive Species Specialist Group (ISSG), special lift-out in *Aliens*, 12 Dec., 12 pp.

30. Lyster S. (1985). – International wildlife law. Grotius, Cambridge, 470 pp.

31. McNeely J.A. (2001). – An introduction to human dimensions of invasive alien species. *In* The great reshuffling: human dimensions of alien invasive species (J.A. McNeely, ed.). The World Conservation Union (IUCN), Gland, Switzerland and Cambridge, 5-22.

32. McNeely J.A., Mooney H.A., Neville L.E., Schei P.J. & Waage J.K. (eds) (2001). – A global strategy on invasive alien species. The World Conservation Union (IUCN), Gland and Cambridge, 50 pp.

33. Ministry of Agriculture and Forestry (MAF) (1999). – Guide to the Animal Welfare Act 1999. Ministry of Agriculture and Forestry, Wellington, 28 pp.

34. Office International des Epizooties (OIE) (2000). – Diagnostic manual for aquatic animal diseases, 3rd Ed. OIE, Paris, 237 pp.

35. Office International des Epizooties (OIE) (2001). – International animal health code: mammals, birds and bees, 10th Ed. OIE, Paris, 485 pp.

36. Office International des Epizooties (OIE) (2001). – International aquatic animal health code, 4th Ed. OIE, Paris, 155 pp.

37. Office International des Epizooties (OIE) (2001). – Manual of Standards for diagnostic tests and vaccines, 4th Ed., 2000. OIE, Paris, 957 pp.

38. Partnership for Action against Wildlife Crime (PAW) (2000). – Working group reports. *In* PAW *Bulletin* (N.P. Williams & J. Withey, eds). The Global Wildlife Division, Department of the Environment, Transport and the Regions, Bristol, 7.

39. Reeve R.V.A. (2000). – CITES and compliance; past present and future. LLM Thesis, University of London, London, 65 pp.

40. Sinclair A.R.E. (1977). – The African buffalo: a study of resource limitation of populations. University of Chicago Press, Chicago.

41. Stattersfield A.J. & Capper D. (2000). – Threatened birds of the world. BirdLife International and Lynx Editions, 852 pp.

42. Ten Kate K. & Laird S.A. (1999). – The commercial use of biodiversity. Earthscan, London, 398 pp.

43. Van Heijnsbergen P. (1997). – International legal protection of wild fauna and flora. IOS Press, Amsterdam, 261 pp.

44. Wijnstekers W. (2001). – The evolution of CITES, 6th Ed. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Geneva, 499 pp. (http://www.cites.org/common/docs/Evol_2001.pdf., document accessed on 24 January 2002).

45. World Conservation Union/United Nations Environment Programme/World Wildlife Fund (IUCN/UNEP/WWF) (1991). – Caring for the earth: a strategy for sustainable living. IUCN, Gland, 228 pp.

46. World Conservation Union/Invasive Species Specialist Group (IUCN/ISSG) (2000). – Global invasive species database (http://www.issg.org/database/welcome/, document accessed on 24 December 2001).

47. World Resources Institute (WRI), World Conservation Union (IUCN) & United Nations Environment Programme (UNEP) (1992). – Global biodiversity strategy: guidelines for action to save, study and use earth's biotic wealth sustainably and equitably. WRI, IUCN, UNEP Washington, DC, 260 pp.

48. World Trade Organization (WTO) (1995). – The results of the Uruguay Round of multilateral trade negotiations, the legal text: Agreement on the Application of Sanitary and Phytosanitary Measures. WTO, Geneva, 69-84.