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# Waterbirds around the world

A global overview of the conservation,  
management and research of the  
world's waterbird flyways

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## Waterbird conservation in a new millennium – where from and where to?

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The *Waterbirds around the world* conference held in Edinburgh in April 2004 was a major milestone for waterbird conservation. There has long been recognition of the need for international perspectives in the conservation of migratory birds, and especially waterbirds. Indeed, 90 years ago the USA and Great Britain, on behalf of Canada, formally agreed the first of the modern international conservation treaties related to migratory birds.

The development of the International Waterfowl Research Bureau (IWRB) in the years following the Second World War is outlined by Kuijken (this volume). On the European continent, IWRB has been highly effective in progressively stimulating a range of collaborative international actions for waterbird and wetland conservation. Major IWRB conferences – more fully described by Kuijken – were held at Noordwijk aan Zee, The Netherlands (1966), Leningrad, USSR (1968), Ramsar, Iran (1971), Astrakhan, USSR (1989), St. Petersburg Beach, Florida, USA (1992), Kushiro, Japan (1994), Strasbourg, France (1994), Kuala Lumpur, Malaysia (1995), and Dakar, Senegal (1998).

Participation in these meetings has grown steeply to the present, in terms of numbers of participants and countries represented, as well as in numbers of represented international organisations (Figs. 1 & 2). It is striking to see such an upsurge of interest since 1989.

In introducing these proceedings and noting that *Waterbirds around the world* was the first major international conference specifically concerning waterbirds of the twenty-first century, we first consider the historical context of international waterbird conferences, and then move on to look beyond the Edinburgh conference. Table 1 summarises the main themes of some of the previous international meetings and conferences on the conservation of waterbirds and their wetland habitats.

### DEVELOPMENT OF MAJOR THEMES IN WATERBIRD CONSERVATION

#### Mechanisms and means of international co-operation

The main themes of some of the previous international meetings and conferences on the conservation of waterbirds and their wetland habitats are summarised in Table 1. In North America there has been a very long history of international collaboration in the conservation of waterbirds at continental scales. This was established early through the 1916 Migratory Birds Treaty between the USA and the UK (on behalf of Canada), developed in 1936 through a further treaty between the USA and Mexico (more fully outlined by Schmidt, this volume). The signing of the North American Waterfowl Management Plan in 1985 gave a mechanism for collaboration between governments and a wide range of

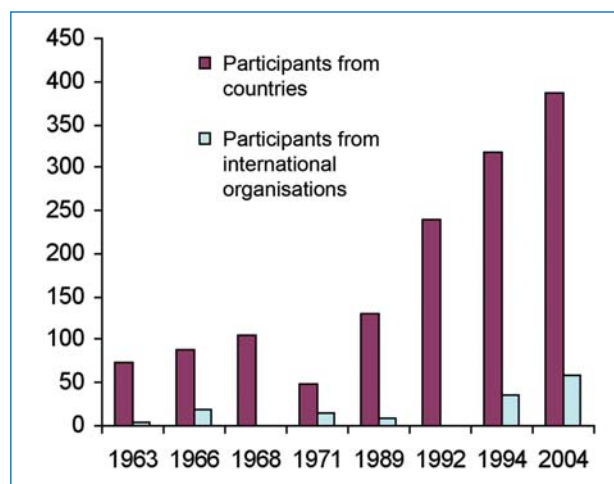


Fig. 1. Increasing numbers of participants at international conferences on waterbirds, 1963-2004.

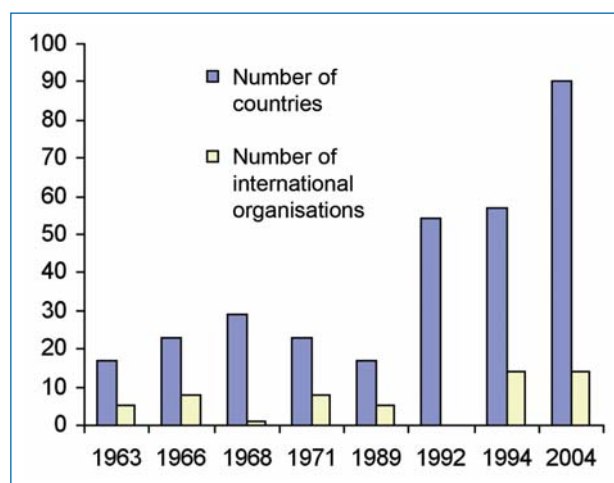


Fig. 2. The increasing geographic and international institutional participation in international conferences on waterbirds, 1963-2004.

non-governmental stakeholders and has been particularly effective (Wheeler, this volume). In the 1990s, the Western Hemisphere Shorebird Reserve Network (WHSRN) gave an informal mechanism for site-twinning and thus the building of links between waterbird conservationists in North and South America (Hunter *et al.* 1991). More recently, two international conferences have developed the Western Hemisphere Migratory Species Initiative as a means of promoting international co-operation at continental scales (Schmidt, this volume, Ralph & Rich 2005).



**Fig. 3.** The seventy-eight participants at the First European Meeting on Wildfowl Conservation held in St. Andrews, Scotland, 1963. Photo: Colin Galbraith, from an original by the Nature Conservancy.

The establishment and progressive development of the International Wildfowl Research Bureau (IWRB) by Luc Hoffman and others in the years following the Second World War was a major step forward (see Kuijken, this volume). From the outset, IWRB provided an organisational means of promoting international collaboration and co-operation in wildfowl conservation and research. Its initial activities, however, were largely restricted to NW Europe and parts of North Africa, and largely focussed on understanding the size, distribution and trends of wildfowl populations. However, an important early aim was also to develop a good insight in harvest pressure on species, and the creation of an IWRB Hunting Rationalisation Research Group in 1969 pioneered international assessments of waterbird harvests (Lampio 1974, 1977). Whilst IWRB's initial activity was focussed on Anatidae, the scope of interest and activity progressively broadened to encompass waders (Lippens 1967, Prater 1974) and to other waterbird taxa.

IWRB, in close collaboration with the UK Nature Conservancy, provided the impetus for the convening of a First European Meeting on Wildfowl Conservation in St. Andrews, Scotland. This conference was held in October 1963 and attracted 73 participants from 17 countries (Fig. 3). Much discussion related to the need to create mechanisms of collaboration (Table 1), and one of the key conclusions was that "all delegations [were] unanimously of the opinion that such European meetings should be held at regular intervals in the future..."

A major topic for consideration in St. Andrews was the possibility of establishing an international legal treaty related to the conservation of the wetland habitat of wildfowl. As described in detail by Matthews (1993) and Kuijken (this volume), this was a major theme of the subsequent international conferences leading to the formal agreement of the Convention on Wetlands of International Importance, especially as waterfowl habitat at Ramsar, in Iran 1971 (Carp 1973). The ensuing Ramsar Convention has increasingly broadened its activities and remits from its original focus on wildfowl into a more holistic

international instrument concerned with all aspects of wetland conservation, especially in recent years, and now with issues of sustainable development through wetland conservation to the fore.

As the implementation and activities of the Ramsar Convention has developed, other international mechanisms for waterbird conservation and international co-operation have been established. The Convention on Migratory Species (CMS) was established in 1979, in turn leading to the formal agreement of the Agreement on the conservation of Africa-Eurasian migratory waterbirds in 1995 (Boere unpublished; see Lenten, this volume).

The development of formal multilateral treaties in Asia and Oceania have taken somewhat longer to achieve, although a range of formal bilateral agreements on the conservation of migratory waterbirds have been established, mainly between Japan, Russia, USA and Australia (Lane & Parish 1991). The Asia-Pacific Migratory Waterbird Conservation Strategy — more fully described by Mundkur (this volume) has been very influential since 1996 in building not only site-networks but also encouraging informal processes of collaboration research and conservation (Long & Watkins 2005a,b, Straw 1997, 2005). The development in recent decades of a comprehensive environmental protection regime in Antarctica through the 1991 Protocol on Environmental Protection to the Antarctic Treaty has been of huge global significance on constraining potential human impacts on this unspoilt 'continent of science'. Similarly, the adoption in 1982 of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) and its subsequent implementation has been a major step forward in moving, internationally, to regulate man's impact in the marine environment — not withstanding the greatly problematic illegal, unregulated and unreported fishing highlighted by HRH the Prince of Wales in his address to the conference (this volume). Most recently, the coming into force of the Agreement on the Conservation of Albatrosses and Petrels (ACAP) seeks, inter alia, to address the cause of impacts and threats to these species



**Fig. 4.** The publication of an international species action plan (inset) for Lesser White-fronted Goose *Anser erythropus* (Heredia *et al.* 1996) was an important stimulus for a range of conservation initiatives as reported by several authors elsewhere in this volume. An update of the action plan was discussed at an international conference in Lammi, Finland in April 2005. Photo: Ingar Jostein Øien.

on the international high seas – of crucial importance in reversing current negative population trends. The establishment and implementation of such international regulatory regimes for the environment are a major achievement for proponents of conservation and sustainable use, although they tend often to be overlooked by those whose outlooks are either terrestrial or more orientated to the northern hemisphere.

In the Americas, the Migratory Birds Act 1936 is restricted to Canada, USA and Mexico and does not formally include other Central or South American countries. Potentially the Western Hemisphere Convention could act as multilateral instrument; the recent adopted USA/Neotropical Migratory Bird Conservation Act provides a framework for support to migratory birds projects and programmes, including waterbirds, in the Neotropics, but is not a formal flyway conservation instrument; see also Boere & Rubec (2002) and Boere (2003) for a more detailed overview of relevant bilateral and multilateral instruments.

The Waterbirds around the world Conference in Edinburgh was an opportunity to compare and contrast the different institutional approaches being adopted around the world concerned with the processes of international collaboration for waterbird conservation. One of these, the development of national and international single species action plans for threatened waterbirds, has been an important means of cost-effectively directing conservation activity. Conservation action plans were first discussed at the St. Petersburg conference in 1992, and were an important element of discussions at the Anatidae 2000 Conference in Strasbourg in 1994. In the years since, they have become increasingly adopted as a central means of delivery of conservation actions (e.g. Heredia *et al.* 1996). Whilst early

discussions concentrated on format and structure of action plans, discussions in Edinburgh highlighted that many plans remain largely unimplemented. If action plans are to be effective, they must be adequately resourced, and be sufficiently ‘owned’ by the interested parties in order for them to be effectively implemented (see Flyway management for species of conservation concern, this volume).

Stroud *et al.* (2004, and this volume) in their review of the status of migratory waders in Africa and Western Eurasia, showed that that area has the greatest number of declining wader populations (12 of 22 populations - 55%). Effectively, this region



**Fig. 5.** Political changes in the early 1990s aided the undertaking of international research programmes in the Russian arctic. International expedition arriving at the island of Izvestia Tronoy, Taimyr, 1993 to assess numbers of Ivory Gulls *Pagophila eburnea*. Photo: Gerard Boere.

embraces the European Union (EU15), which also has the greatest extent of species-orientated international legislation specifically requiring countries to maintain a favourable conservation status of waders (and other birds). Both the European Union's Directive on the Conservation of Wild Birds (the so called EC Birds Directive) and the Council of Europe's Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) have been in force since 1979 suggesting that additional delivery and implementation mechanisms are needed to address the fundamental drivers of population declines. Stroud *et al.* (this volume) stress that whilst national and international strategies and legal conservation instruments have scope to help, they need to be much more penetrating in their implementation so as to address root causes of population declines.

The major political changes in eastern Europe in the late 1980s and early 1990s led to unprecedented new opportunities for international co-operation, not least the organisation of major meetings which brought together waterbird researchers from western Europe with those from the former USSR. A notable example was the International Wader Study Group's conference in Odessa, Ukraine in April 1992, which involved 79 participants from 13 countries, and developed The Odessa Protocol on international co-operation on migratory flyway research and conservation (Hötter *et al.* 1998). The Odessa Proceedings contained a wealth of previously unpublished information on wader research and survey from central and eastern Europe, and Asia. The political changes also facilitated the development of joint research programmes in the Russian arctic, notably through a series of joint expeditions involving, variously, Russian, Dutch and German waterbird researchers (Fig. 5).

### Habitat protection

The need to promote the conservation of wetland habitats in the face of habitat loss and degradation has been a central theme for international conferences. Human impacts on wetlands were clearly the major motivation for initial conservation measure in North America (Schmidt, this volume), and especially the creation of the Ramsar Convention which drew from initial European evaluations in 1962 by Project MAR (Kuijken, this volume, Matthews 1993). Whilst initial conferences focussed on the need to stem habitat loss, more recent conferences (since the 1990s) have increasingly also focussed on the exchange of information regarding means of restoration and rehabilitation of degraded habitats, as well as the appropriate management of wetlands to enhance their carrying capacity (Table 1). The important topic of wetland restoration has increasingly been addressed through targeted meetings (e.g. Moller 1995 in Denmark) and a growing specialist literature has developed especially aimed at practitioners (e.g. Eiseltová 1994, RSPB, NRA & RSNC 1994, Hertzman & Larsson 1999).

Interestingly, as early as the 1968 Leningrad meeting, habitat and predator management as a means of increasing site-carrying capacity was under discussion. Although the impact of non-native species is now recognised as one of the principal causes of biodiversity loss world-wide (Millennium Ecosystem Assessment 2005a), previously there was discussion of the introduction of non-native waterbirds for hunting (most recently at the 1989 Astrakhan conference which heard of proposals to introduce

Canada Geese *Branta canadensis* to the USSR: Gabuzov 1990).

Workshops at Edinburgh considered the need for holistic approaches to conservation which need to include elements related both to site-based protection and wider countryside policies (Building effective ecological networks; and integrating waterbird conservation, populations, habitats and landscapes, this volume).

In spite of modern techniques to analyse habitat losses and the increasingly global coverage of the International Waterfowl Census and other monitoring schemes, it is still almost impossible to determine the consequences of some large scale habitat losses for waterbird populations. Indeed, habitat loss and fragmentation remains a major threat to many waterbird populations. A topical example is the lack of information concerning the fate of the immense waterbird populations formerly present in the Mesopotamian marshes of Iraq (Evans 1994). Although parts of the marshes are now being restored and 're-wetted', the understanding and monitoring of the accompanying ecological changes are limited. Such knowledge limitations typically are the consequence of political instability and/or lack of resources constraining an ability to undertake relevant surveys and monitoring.

### Developing issues

Edinburgh saw substantive discussions on a number of new issues. Climate change has emerged in the last decade as one of the central challenges for the long-term conservation, not only of waterbirds but for the world's biodiversity. It has the potential to further and markedly exacerbate the negative impacts of other current and principal drivers of ecosystem changes such habitat change, the impacts of invasive species, over-exploitation and pollution (Millennium Ecosystem Assessment 2005a, Finlayson *et al.*, this volume; The implications of climate change for waterbirds, this volume). Possible consequences of climate change for the implementation of multilateral treaties in relation to waterbirds are discussed by Boere & Taylor (2004).

Whilst the recent spread of Asian lineage Highly Pathogenic Avian Influenza H5N1 westwards across Eurasia occurred after the Edinburgh Conference, the holding of a workshop on avian disease issues in Edinburgh (Disease emergence and impacts in migratory waterbirds, this volume) underlined the importance of this issue which has not previously been considered as an integral part of any previous international conference on waterbird conservation. The need to better develop links between veterinarians and the ornithological research and conservation communities was emphasised.

Possibly the most significant element in the Edinburgh programme which contrasted with earlier conference programmes, was recognition of the increasing need to promote the 'mainstreaming' of waterbird conservation within other governmental policies. In other words, how to ensure full and effective integration of conservation objectives in the policies and programmes of others – and not just of the traditional conservation 'sector' itself. This was manifest through discussion of the importance of communication, education and public awareness (Let the waterbirds do the talking, this volume); reviews of conflict resolution and reduction (Conflict resolution, this volume); assessments of the opportunities that modification of wider land-use policies provide for the promotion of waterbird conservation (Integrating waterbird conservation, populations,

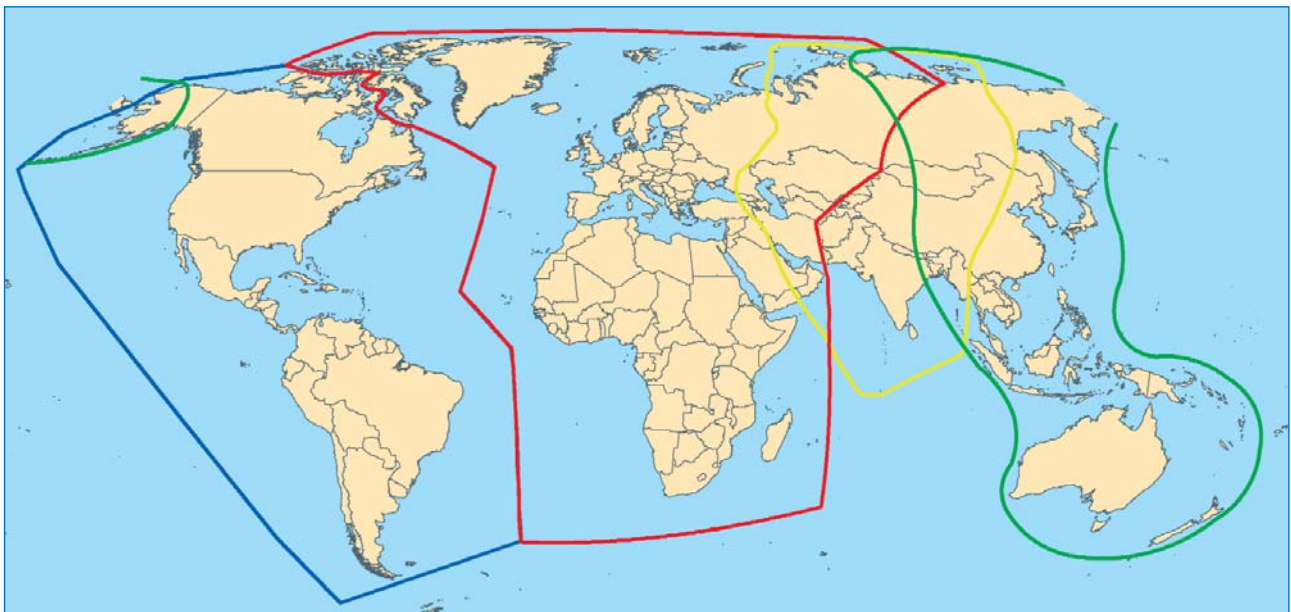


Fig. 6. The possible global scope of multilateral agreements for the conservation of migratory waterbirds.

habitats and landscapes, this volume); the need to build human capacity for conservation and research, especially in developing countries (Building and sustaining capacity for waterbird conservation and research, this volume); and finally discussion of a central issue, how to develop sustainable programmes of funding to support conservation initiatives (Financing global conservation: innovation, linkages, options, this volume).

At the beginning of the twenty-first century, and in a world which faces increasing acute pressures not only on ecosystems but also on human communities and societies across most of the less-developed world (Millennium Ecosystem Assessment 2005a,b,c), the cross-sectoral approach to ecosystem conservation and management is taking the centre stage of attention.

### Beyond Edinburgh...

The Conference conclusions were formalised as *The Edinburgh Declaration*. We highlight below several key issues for the future, stressed not only in the Declaration but also in many of the papers included in this volume:

- **Making more effective use of existing legal and policy instruments.** In many parts of the world a wide range of legal and policy instruments relevant to the conservation of waterbirds and their habitats exist, not least, being the Convention on Biological Diversity (CBD) to which 188 countries are currently Contracting Parties. Whilst CBD is essentially a framework Convention, the Ramsar and Bonn Conventions are more specific regarding waterbird and wetland conservation whilst also having global scope and relevance. Such international legislation, supported by national laws and policies already gives considerable opportunity for the promotion of waterbird conservation and the achievement of sustainable use. The immediate challenge is to ensure the effective *implementation* of the provisions of these existing treaties. In doing this the continued sharing of national experiences will continue to be important. However, the development of further multilateral flyway agreements similar in conceptual scope to AEWA could

provide global coverage of migratory flyways and focus for international waterbird conservation (Fig. 6).

- **Enhancing resourcing and human capacity.** There are few, if any, countries, where there is adequate capacity to address the multiple challenges posed by the current ever degrading environmental conditions. World leaders at the World Summit on Sustainable Development, Johannesburg, in 2002, established a target of “*a significant reduction in the current rate of loss of biological diversity*” by 2010, but noted that to achieve this target “*will require the provision of new and additional financial and technical resources to developing countries*”. This need remains as urgent as ever, and the Edinburgh workshops on ‘Financing global flyway conservation’, and ‘Building and sustaining capacity for waterbird conservation and research’ specifically addressed these issues (Castro, this volume).
- **Responding with urgency.** The planet is currently facing an extinction crisis. The conclusions of the Millennium Ecosystem Assessment (Millennium Ecosystem Assessment 2005a,b,c) have served as a wake-up call to the severity of the issues and the urgency of necessary responses at all levels. The Millennium Ecosystem Assessment found that “*The degradation and loss of wetlands is more rapid than that for other ecosystems. The status of freshwater dependent species (in both inland and coastal areas) is deteriorating faster than those of other ecosystems. Wetland-dependent biodiversity in many parts of the world is in continuing and accelerating decline.*” More detailed assessments that re-enforce this conclusion are reported in this volume (Declining waterbirds: problems, processes and sites, this volume). We need to promote early conservation actions: later may be *too* late — patients are typically easier (and certainly cheaper) to treat *before* they reach the Intensive Care Ward!
- **Demonstrating relevance of waterbird conservation in a pressured world.** Governments and others face many priorities in delivering Millennium Development Goals concerning food and water security, sanitation, and poverty

reduction. In a world with much extreme human poverty, those concerned for waterbirds will need increasingly to be prepared to justify the relevance of this activity. However, the role of healthy wetlands in providing ecosystem services to human populations across the world (Finlayson, this volume; Millennium Ecosystem Assessment 2005c) provides this rationale. *“Species-focused arguments are unlikely to have significant influence on decision-making on trade-offs between the maintenance of wetland ecosystems and sustain-*

- **Better engagement with the public and stakeholders.** Sustainable development on the one hand, and achieving conservation goals through the resolution of management-conflicts requires close engagement with multiple ‘stakeholders’ – those people whose lives are affected or influenced by decisions taken or policies adopted. The Conference heard of many examples of successful conflict resolution (Conflict resolution, this volume) as well as specifically considering linked communication, education



**Fig. 7.** Children celebrating waterbirds dance at the launch of World Migratory Birds Day at Laikipia, Kenya, 9 April 2006. Photo: David Stroud.

*able development, and more potent arguments are likely to involve the importance of maintaining and enhancing ecosystem services so that they continue to support human livelihood. To achieve this requires the maintenance of wetland biodiversity and processes, which in turn will help maintain the ecosystems upon which waterbirds depend. Using waterbirds as flagship indicators of the health of wetland ecosystems can help to secure adequate trade-offs to ensure that these ecosystems can continue to deliver their services. However, more clearly articulating these arguments for continued research and monitoring of waterbirds for the benefit of decision-makers is much needed.”* (Davidson & Stroud, this volume). Accordingly, waterbird conservationists will need to become more adept at justifying ‘traditional’ conservation of biodiversity in the context of human sustainable development. As an example, the role of sustainably managed waterbird populations in providing a valuable source of protein source for human populations in developing countries and elsewhere could be stressed (Kanstrup, this volume).

and public awareness issues (Let the waterbirds do the talking, this volume). These are crucial activities and need to be considered as essential element for any conservation programme to be successful. Initiatives such as the recently established World Migratory Birds Day, on 9 April 2006, provide opportunities to allow the threats faced by migratory waterbirds to be highlighted with a wide range of audiences, as well as giving opportunity to celebrate the cultural importance of waterbirds communication (Fig. 7).

- **Combating negative images of waterbirds.** A consequence of the spread of Asian lineage Highly Pathogenic Avian Influenza H5N1 across Eurasia since the Conference has been that increasingly, the media have portrayed waterbirds in a very negative context and there remains widespread public misunderstanding of the issue in many countries, including circulation of misinformation. Indeed, in the UK, visitor numbers to waterbird conservation centres have fallen in a significant and sustained manner. Such negative portrayal has the potential to undo decades of work by conservation communicators such as Sir Peter Scott and

**Table 1. Main themes of international conferences and meetings related to the conservation of waterbirds and their wetland habitats, 1966-2004.**

First European Meeting on Wildfowl Conservation, St. Andrews, Scotland (1963)	Noordwijk aan Zee, The Netherlands (1966)	Leningrad, USSR (1968)	Ramsar, Iran (1971)	Astrakhan, USSR (1989)	St. Petersburg Beach, Florida, USA (1992)	Kushiro, Japan (1994)	Anatidae 2000, Strasbourg, France (1994)	International Conference on wetlands and development, Malaysia 1995	Second international conference, on wetlands and development, Dakar 1998	Waterbirds around the world, Edinburgh, Scotland (2004)
(Swift 1964)	(Salverda 1967)	(Isakov 1970)	(Carp 1972)	(Mattheus 1990)	(Moser <i>et al.</i> 1993)	(Wells & Mundkur 1996)	(Birkan <i>et al.</i> 1996)	(van Vessem 1997)	(Beintema & van Vessem 1999)	(Boere <i>et al.</i> this volume)
National status reviews for European countries	Review of status of waders and wader research in Europe, North Africa and Asia Minor	Review of status of main wildfowl populations in western Eurasia	National reports on the status of wetlands and their waterbird populations including those on the MAR list	Reviews on the distribution and status of waterfowl, especially in the USSR and Europe, but also including the Americas and Africa	National reviews of status for 19 countries or territories	Workshops on studies and research for a) shorebirds and b) other waterbirds	Major world-wide status reviews for ducks, geese and swans			Regional (flyway-scale) reviews of status and trends of waterbirds especially in the Arctic. Neotropics, North America, intra-African migration systems, Central Asian flyway & the East Asia-Pacific flyway
<b>Regional status reviews of species and habitats</b>	Review of status of wetlands in countries on the MAR list	Review of results from IWC in western Eurasia	National reports on the status of wetlands and their waterbird populations including those on the MAR list	Reviews of actual or potential international strategies for waterbird conservation under North American Waterfowl Management Plan, and CMS	Workshop on wetland and waterbird conservation in North America	National reviews of status for 19 countries or territories				Global status review for waders
<b>Hunting and sustainable use of waterbirds</b>	Review of hunting legislation in Europe and USA	Discussions on the "relationship between conservationists and shooting interests" with case studies	Discussions as to a possible wetlands convention	Discussions on criteria for selecting internationally important wetlands	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings
<b>Mechanisms for international collaboration</b>	Discussions as to improved means of international co-operation in Europe on wildfowl conservation, including the need for regular international meetings	Discussions as to a possible wetlands convention	Discussions on criteria for selecting internationally important wetlands	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings
<b>Conservation of wetlands and other waterbird habitats</b>	Discussions as to improved means of international co-operation in Europe on wildfowl conservation, including the need for regular international meetings	Discussions as to a possible wetlands convention	Discussions on criteria for selecting internationally important wetlands	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings
<b>Management of wetlands and other habitats</b>	Discussions as to improved means of international co-operation in Europe on wildfowl conservation, including the need for regular international meetings	Discussions as to a possible wetlands convention	Discussions on criteria for selecting internationally important wetlands	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings	Discussions on the need for regular international meetings

**Table 1. Main themes of international conferences and meetings related to the conservation of waterbirds and their wetland habitats, 1966-2004 (continued).**

First European Meeting on Wildfowl Conservation, St. Andrews, Scotland (1963)	Noordwijk aan Zee, The Netherlands (1966)	Leningrad, USSR (1968)	Ramsar, Iran (1971)	Astrakhan, USSR (1989)	St. Petersburg Beach, Florida, USA (1992)	Kushiro, Japan (1994)	Anatidae 2000, Strasbourg, France (1994)	International Conference on wetlands and development, Malaysia 1995	Second international conference, on wetlands and development, Dakar 1998	Waterbirds around the world, Edinburgh, Scotland (2004)
(Swift 1964)	(Salverda 1967)	(Isakov 1970)	(Carp 1972)	(Matthevs 1990)	(Moser <i>et al.</i> 1993)	(Wells & Mundkur 1996)	(Birken <i>et al.</i> 1996)	(van Vessem 1997)	(Beintema & van Vessem 1999)	(Boere <i>et al.</i> this volume)
<b>Species conservation and action planning</b>	Reviews of various impacts on waterbirds including habitat loss, persistent pesticides and radioactive contamination	Review of legislative status of waders in Europe, North Africa and the Middle East	Review of legislative status of waders in Europe, North Africa and the Middle East	Reviews on: <ul style="list-style-type: none"> <li>conservation on threatened species</li> <li>effects of shooting disturbance</li> </ul>	Workshop on international conservation plans for migratory waterbirds	Workshop on domestic policy and legislation for wetland sites and waterbird species	Workshops on: <ul style="list-style-type: none"> <li>recovery programmes, including international action plans, for Anatidae</li> <li>population ecology of threatened species</li> </ul>	Workshop on planning, implementation and evaluating conservation actions	Workshop on global waterbird conservation strategies	Workshops on: <ul style="list-style-type: none"> <li>flyway management for species of concern</li> <li>declining waterbirds: problems, processes and sites</li> </ul>
<b>Integrated monitoring and conservation for migratory waterbirds</b>					Workshop on integrated monitoring: priorities and needs		Workshops on: <ul style="list-style-type: none"> <li>population dynamics and implications for monitoring and conservation</li> <li>ecology and implications for conservation</li> </ul>	Workshop on information needs for waterbird and wetland conservation	Workshops on: <ul style="list-style-type: none"> <li>flyway-scale monitoring: rising to the challenge</li> <li>migration and flyway atlases</li> <li>integrating waterbird conservation: populations, habitats and landscapes</li> </ul>	
<b>The marine environment</b>							Significant inputs related to sea-ducks throughout the conference			Workshop on the marine environment: challenges for conservation and implementation
<b>Measuring ecological change in wetlands</b>					Workshop on ecological change in wetlands and the use of waterbirds as indicators					
<b>Disease processes</b>										Workshop on disease emergence and impacts in migratory waterbirds
<b>Waterbirds and people — communication, education and public awareness</b>						Workshop on training, institutional capacity and public involvement				Workshops on <ul style="list-style-type: none"> <li>conflict resolution</li> <li>education and public awareness</li> <li>financing global flyway conservation: innovation, linkages, options</li> <li>building and sustaining capacity for waterbird conservation and research</li> </ul>
<b>Climate change</b>				Paper on effects of natural climate cycles on waterbird reproduction						Workshop on climate change

others. Misinformation leading to unnecessary fear creates political pressure for ill-advised and disproportionate policies such as the culling of wild birds and the destruction of wetland habitats. There is an urgent need for conservation scientists and veterinary services to pro-actively work with media to enhance the accuracy of reporting on this issue. As recently stressed by the CMS, AEWa & UNEP International Seminar on avian influenza (2006), this should include the development of much more effective communication strategies to give policy makers, stakeholders and the general public more balanced information on real levels of risk and appropriate responses.

- **Focussing conservation actions where they are most effective.** This volume outlines the wide range of conservation 'tools' that are available in the twenty-first century. However, it is increasingly important that scarce and possibility diminishing resources for waterbird conservation are cost-effectively used to the greatest effect. The development of conservation action plans (Flyway management for species of conservation concern, this volume) provides a means of objectively determining priority actions. These should be informed by integrated population monitoring which identifies critical demographic processes or life-history stages driving population declines (Pienkowski & Galbraith 1993, Piersma, this volume, Blohm *et al.*, this volume).
- **Resourcing monitoring activity.** There is a long history of waterbird monitoring at national and international scales notably through the International Waterbird Census (IWC), yet resourcing for this essential activity remains *ad hoc* and grossly inadequate. Given that monitoring provides us with the most fundamental of information on the status of waterbirds and their trends, it is essential that there is adequate and sustained funding for such monitoring. AEWa (2005) has recently called for an international partnership to support international waterbird monitoring and this should be strongly supported. Compared to the budgets of 'Big Science' projects, the absolute amounts allocated to annually maintain the IWC are tiny – almost trivial. Yet, as stressed throughout this volume, waterbirds are powerful indicators of environmental quality, with birds often integrating environmental information at continental scales (Piersma & Lindström 2004, Piersma, this volume). Data and information derived from the IWC can provide a powerful indication of the status not just directly of waterbirds themselves, but also of many other aspects of wetland biodiversity.
- **Access to data and information for decision makers.** Many governments and others have undertaken risk assessments related to the spread of highly pathogenic avian influenza H5N1. Yet, the process of undertaking these highlighted how poorly organised much data and information on waterbirds is to rapidly inform government and other decision makers. This is no organisational criticism, but is another aspect of the inadequacy of long-term financing for much waterbird conservation. There is an urgent need to synthesize the huge volume of data which exist on individual bird movements into flyway atlases and other information products in order to inform decision makers (Migration and flyway atlases, this volume, Wernham *et al.* 2002, Veen *et al.* 2005). If we are to *really* underpin governmental decisions and policies, our data and information has to be readily and rapidly accessible.

## CONCLUSIONS

We conclude with three reflections on cross-cutting needs highlighted by *Waterbirds around the world*:

- First, we need a **clear understanding of the key issues which are currently affecting waterbird status and trends.** This means establishing and maintaining international monitoring and reporting processes so that we have regularly updated summaries of the status and trends of waterbirds: we need to know what is actually happening out there!
- Second, we need to **establish clear and strategic priorities for action.** There is much, indeed *too* much, to do, and we need to guide actions to where they will be most effective for the greatest good. A sharp focus on the real priorities is paramount.
- Finally, we need to **continue to work co-operatively,** across national borders, both formally and informally, to put in place solutions to the increasingly complex and challenging problems. Working together, we have a chance of tackling these issues; individually, we do not.

Yet we should not end on too pessimistic a note. The *Waterbirds around the world* conference was attended by His Royal Highness, The Prince of Wales and by three Government Ministers with environmental responsibilities. All have demonstrated their commitment to the conservation of wetlands and waterbirds through inspired and spirited presentations – we earnestly hope that such statements will inspire others to act.

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An international action plan has recently been developed for the globally threatened Sociable Plover *Vanellus gregarius*. This has already stimulated international collaborative research funded under the UK's Darwin Initiative to investigate the causes of decline. Ultimately, the success of international conservation action plans will be judged by their effectiveness in halting and reversing population declines for such threatened waterbirds. Photo: Sergey Dereliev.