



The **Development**
and **Application** of
Ecological Networks

A Review of Proposals, Plans and Programmes

Graham Bennett & Piet Wit
July 2001

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ACKNOWLEDGEMENTS

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This review could not have been prepared without the support of the many groups who responded to a request for information on their ecological network initiatives. They did this willingly despite an exceptionally heavy burden of other work. The authors gratefully acknowledge their efforts and trust that they will also benefit from the results of the exercise.

The study was carried out in cooperation with IUCN – The World Conservation Union, who made their resources available to the project team. The authors are especially grateful to Jean-Yves Pirot at IUCN headquarters for his support throughout the duration of the project.

Funding for the study was kindly provided by the Dutch Ministry of Agriculture, Nature Management and Fisheries and the Dutch Ministry of Foreign Affairs (Matra Fund).

The views expressed in the report are those of the authors and do not necessarily reflect those of the Dutch government or IUCN.

SUMMARY

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This report comprises a worldwide review of 38 ecological network initiatives that are currently being developed or implemented. It includes an inventory of a wide range of proposals, plans and ongoing programmes to establish ecological networks at scales varying from the regional to intercontinental, and summary findings on the main features of the initiatives. The report is intended as a contribution to IUCN's review of experience in developing and applying ecological networks which was initiated through a resolution adopted at the 1996 World Conservation Congress.

For the purposes of the study, an ecological network is regarded as a coherent system of natural and/or semi-natural landscape elements that is configured and managed with the objective of maintaining or restoring ecological functions as a means to conserve biodiversity while also providing appropriate opportunities for the sustainable use of natural resources. Many different names are used to describe this broad approach, the most common being ecological network, reserve network, bioregional planning and ecoregion-based conservation. However, all of the models are characterised by five key elements, namely:

- ▶ a focus on conserving biodiversity at the ecosystem, landscape or regional scale
- ▶ an emphasis on maintaining or strengthening ecological coherence, primarily through providing for ecological interconnectivity
- ▶ ensuring that critical areas are buffered from the effects of potentially damaging external activities
- ▶ restoring where appropriate degraded ecosystems
- ▶ promoting complementarity between land uses and biodiversity conservation objectives, and particularly by exploiting the potential biodiversity value of associated semi-natural landscapes.

In total, 119 initiatives were originally identified as ecological networks. During the course of the study, this number rose to over 150. Detailed information was subsequently collated on 38 of these networks: 17 international networks, 10 national in scope and 11 sub-national. In terms of geographical distribution, eight of the networks are intercontinental initiatives, 25 are located in Europe, two in North America, one in South America, one in Asia and one in Australia. The strong bias towards European networks is primarily the combined result of the relatively large number of ecological networks in Europe and the high response rate from these initiatives.

Of the 38 networks, 13 have progressed to the stage of an implementing programme, although none had been fully implemented at the time of writing. A detailed plan was being, or had been, prepared for all but five of the initiatives. There was a virtual balance in the number of networks that had been initiated by governmental organisations and those by non-governmental organisations.

The stated objectives of the various initiatives can be distilled into six generic objectives, namely:

- ▶ the conservation of species
- ▶ the conservation of habitats
- ▶ the conservation of ecological and evolutionary processes
- ▶ facilitating the sustainable use of natural resources
- ▶ facilitating sustainable development
- ▶ the conservation of cultural heritage (including indigenous culture).

Virtually all the initiatives aim to conserve species and habitats, and the majority also aim to facilitate the sustainable use of natural resources. Less common as explicit objectives are the conservation of ecological and evolutionary processes and the conservation of cultural heritage.

With the exception of the intercontinental and larger international initiatives, which all cover a wide range of climatic zones, phyto-geographical/vegetation zones and ecosystems, the majority of the networks are located entirely or in part in warm, humid climatic zones, primarily temperate. Nevertheless, all of the major climatic zones are represented in at least one network. With regard to the ecosystems, all major types are represented in the networks, although coastal and pelagic ecosystems are significantly less common.

A notable finding of the review is that all of the initiatives for which information on the socio-economic context on the networks was available explicitly incorporate economic activities in their planning. Indeed, most networks encompass a wide range of land uses: most common are various types of farming. Only about one-third of the initiatives explicitly incorporate the conservation of cultural values into their mission, in practice the conservation of cultural landscapes and historic sites and provision for indigenous peoples.

Almost half of the networks have been initiated by societal interest groups, mainly environmental organisations or applied research institutes. In turn, half of these initiatives have attracted the support of government in developing and establishing the networks. If these networks are added to the networks that are government-driven, only nine of the initiatives are currently without any form of government support. However, the majority of the networks are still in the planning stage and none has yet been fully implemented. Several are due to be realised within five years, although for most establishment is likely to take a further 10–20 years.

Three key conclusions can be drawn from the information presented in the review:

1. It is clear that a generic network model is being increasingly applied to the task of conserving biodiversity, and it is being applied in a wide variety of environmental and socio-economic circumstances, at different scales and by both government and non-governmental organisations.
2. Virtually all of the networks have the twin focus of conserving biodiversity and accommodating to some degree the exploitation of natural resources. The reconciliation of the sustainable use of natural resources with the conservation of biodiversity is being driven by the needs of both developed and developing countries. In developed countries, the greatest potential for enhancing biodiversity conservation can generally be found in the extensive semi-natural habitats which would benefit enormously from actions to promote compatible forms of land use or to develop nature restoration projects; in the developing countries and the countries in transition, increasing emphasis is being placed on strategies which can meet the legitimate economic needs of disadvantaged populations through sustainable forms of development which respect the integrity of the many almost pristine ecosystems.
3. The extent to which ecological networks are succeeding in securing the desired degree of compatibility between natural resource exploitation and biodiversity conservation has not yet been demonstrated: so few networks have yet progressed to an advanced stage of implementation that the opportunities to demonstrate the conservation results that can be achieved in practice through applying the network

model are severely limited. However, the fact that so many ecological network initiatives are now underway, and that this number is rapidly increasing, suggests that the initiators are fully confident that the benefits that this approach promises can ultimately be delivered.

These observations lead to a number of suggestions concerning the implications of this study for further actions to assess the value of the ecological network model:

1. Although the review presents for the first time systematic information on a relatively large number of ecological networks, the even larger number of networks currently under development represent an enormous and growing reservoir of expertise and experience in developing and applying the ecological network model. There would be substantial benefits for both biodiversity conservation and sustainable development if a practicable means could be found to extend this inventory to cover a larger proportion of the known initiatives and to institute a periodic review process.
2. The potential benefits of broadly disseminating information on the initiatives argues for the creation of a global online database. Such a facility would offer the additional advantage of permitting continual updating as new information became available.
3. Since most network initiatives are still at the planning stage, it would be beneficial to analyse the various ecological network methodologies which have been or are being developed and to make the results available to the many groups working on networks around the world.
4. Only a small number of ecological networks have progressed to the point where implementation on the ground is relatively advanced. It is therefore essential that action be taken at an appropriate time to examine critically the experience gained in implementing the networks and to disseminate the results of this assessment.
5. Although several ecological network initiatives in developing countries are known, these initiatives were not in a position to provide the information necessary for this review. It is therefore recommended that supplementary action be taken to collect information on these initiatives and to make it available in appropriate form, especially to the groups working in developing countries.
6. Since the majority of network initiatives are being developed independently of each other, there could well be substantial value in creating interconnectivity between proximate networks and thereby developing larger-scale constellations of networks.

RESUME

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Ce rapport brosse un tableau de 38 projets de réseaux écologiques actuellement en cours d'élaboration ou de réalisation par le monde. Il englobe un inventaire d'une gamme variée de propositions, de plans et de programmes en cours visant à la mise en place de réseaux écologiques à l'échelon régional jusqu'à l'échelon intercontinental, ainsi qu'un résumé des principales caractéristiques de ces initiatives. Ce rapport vise à apporter une contribution au bilan que veut dresser l'UICN des expériences acquises dans le domaine de l'élaboration et de la mise en place de réseaux écologiques, consécutivement à la résolution adoptée lors du Congrès mondial de la Nature en 1996.

Pour les besoins de cette étude, un réseau écologique est considéré comme un système cohérent d'éléments paysagers naturels et/ou semi-naturels, qui est agencé et géré dans l'objectif de maintenir ou de rétablir les fonctions écologiques afin de protéger la biodiversité, tout en offrant des moyens adéquats de réaliser une utilisation durable des ressources naturelles. De nombreux termes différents sont utilisés pour définir une approche aussi large, les plus courants étant réseau écologique, réseau de réserves naturelles, planification biorégionale et conservation écorégionale.

Néanmoins, tous les modèles se caractérisent par cinq éléments clé, à savoir:

- ▶ le souhait de protéger la diversité biologique au niveau de l'écosystème, du paysage ou de la région
- ▶ l'accent sur le maintien et le renforcement de la cohérence écologique, essentiellement en prévoyant une interconnexion écologique
- ▶ s'assurer que les zones critiques sont protégées des effets d'activités extérieures potentiellement nuisibles
- ▶ restaurer des écosystèmes dégradés là où c'est opportun
- ▶ promouvoir la complémentarité des objectifs de l'utilisation des sols et des objectifs liés à la conservation de la biodiversité, notamment en exploitant la valeur potentielle en biodiversité de paysages semi-naturels associés.

Au départ, 119 initiatives furent identifiées comme réseaux écologiques. Au cours de l'étude, ce nombre franchit la barre des 150. Des renseignements détaillés furent ensuite rassemblés sur 38 de ces réseaux: 17 réseaux internationaux, 10 nationaux et 11 régionaux. Sur le plan de la répartition géographique, 8 de ces réseaux résultent d'initiatives intercontinentales, 25 sont situés en Europe, 2 en Amérique du Nord, 1 en Amérique du Sud, 1 en Asie et 1 en Australie. Le penchant marqué pour les réseaux européens est essentiellement le résultat combiné du nombre relativement élevé de réseaux écologiques en Europe et de leur taux de réponse élevé.

Parmi les 38 réseaux, 13 ont atteint le stade d'un programme d'application, bien qu'aucun n'eût été entièrement mis en pratique au moment de la rédaction de ce rapport. Un plan détaillé avait été élaboré (ou était en cours d'élaboration) pour tous les projets à l'exception de 5. On observe que le nombre de réseaux mis en place par des organisations gouvernementales et ceux créés par des organisations non gouvernementales s'équilibrent pratiquement.

Les différentes initiatives poursuivent six grands objectifs communs, à savoir:

- ▶ la sauvegarde des espèces
- ▶ la sauvegarde des habitats
- ▶ la protection des processus écologiques et d'évolution
- ▶ faciliter une utilisation durable des ressources naturelles
- ▶ promouvoir un développement durable
- ▶ la sauvegarde de l'héritage culturel (y compris la culture indigène).

Pratiquement toutes les initiatives visent à sauvegarder les espèces et les habitats, et la majorité tendent également à faciliter une utilisation durable des ressources naturelles. Il est plus rare que la protection des processus écologiques et d'évolution et la sauvegarde du patrimoine culturel soient cités explicitement au chapitre des objectifs de leur mission.

Outre les programmes intercontinentaux et internationaux d'envergure, qui couvrent tous une grande diversité de zones climatiques, de zones de végétation, de zones phytogéographiques et d'écosystèmes, la majorité des réseaux se situent entièrement ou en partie dans des zones climatiques chaudes et humides, essentiellement tempérées. Néanmoins, toutes les zones climatiques importantes sont représentées dans un réseau au moins. En ce qui concerne les écosystèmes, tous sont représentés dans les réseaux, même si les écosystèmes côtiers et pélagiques sont nettement moins courants.

Une conclusion remarquable de l'inventaire est que tous les projets qui disposaient d'informations sur le contexte socio-économique des réseaux, intègrent explicitement des activités économiques dans leur stratégie. En effet, la plupart des réseaux englobent une grande variété d'utilisations des sols, les différents types de culture étant les plus courants. Un tiers seulement des initiatives prend explicitement en compte la sauvegarde des valeurs culturelles dans leur mission, ce qui revient dans la pratique à sauvegarder les paysages culturels et les sites historiques et pourvoir aux besoins des populations indigènes.

Presque la moitié des réseaux ont été mis sur pied par des organismes non gouvernementaux d'intérêt public (O.N.G.), principalement des organismes de défense de l'environnement ou des instituts de recherche appliquée. La moitié de ces initiatives bénéficient du soutien de l'Etat pour l'élaboration et la réalisation des réseaux. Si l'on fait abstraction des réseaux financés par l'Etat et des réseaux d'O.N.G. bénéficiant d'une aide publique, on dénombre seulement neuf initiatives ne bénéficiant d'aucune forme d'aide gouvernementale. Cependant, la majorité des réseaux sont encore à l'état d'ébauche et aucun n'est encore entièrement opérationnel. Si plusieurs doivent être réalisés d'ici cinq ans, la phase de mise en œuvre de la majorité des projets devrait encore durer 10 à 20 ans.

Les données présentées dans ce rapport permettent de tirer trois conclusions principales:

1. Il est évident qu'un modèle générique est de plus en plus souvent appliqué dans la tâche de sauvegarde de la diversité biologique, et ce dans un grand nombre de contextes environnementaux et socio-économiques, à différentes échelles et tant par l'Etat que par les organisations non gouvernementales.
2. Pratiquement tous les réseaux poursuivent le double objectif de protéger la biodiversité et d'adapter dans une certaine mesure l'exploitation des ressources naturelles. L'impératif de concilier une utilisation durable des ressources naturelles et la sauvegarde de la diversité biologique est dicté par les besoins des pays développés et par ceux des pays en voie de développement. Dans les pays développés, les pistes les plus prometteuses pour améliorer la protection de la biodiversité se situent généralement dans les habitats semi-naturels étendus, qui profiteraient énormément de mesures visant à promouvoir des formes compatibles d'occupation des sols ou de projets de réhabilitation de la nature ; dans les pays en voie de développement et les pays de l'Europe centrale et de l'Europe de l'Est en transition, on met de plus en plus l'accent sur les stratégies capables de satisfaire aux besoins économiques –légitimes– des populations désavantagées, passant par

des modèles de développement durables qui respectent l'intégrité des nombreux et vastes écosystèmes encore intacts.

3. On n'a pas encore démontré dans quelle mesure les réseaux écologiques parviennent à garantir le degré voulu de compatibilité entre l'exploitation des ressources naturelles et la protection de la biodiversité. En effet, le nombre de réseaux ayant atteint un stade de réalisation avancé est tellement minime qu'il est difficile de démontrer les résultats de sauvegarde que permet d'atteindre le modèle du réseau écologique dans la pratique. Néanmoins, le fait que tant de projets de réseaux écologiques soient en cours et que ce nombre marque une croissance rapide, sous-entend que leurs instigateurs sont en confiance que cette approche peut répondre aux attentes.

Ces observations nous amènent à formuler un certain nombre de suggestions concernant les implications de cette étude pour les évaluations futures du modèle de réseau écologique:

1. Bien que ce soit la première fois qu'un rapport présente systématiquement des informations sur un nombre relativement important de réseaux écologiques, le nombre encore supérieur de réseaux actuellement en cours d'élaboration représente un énorme réservoir –grandissant– d'expertise et d'expériences dans le développement et l'application du modèle de réseau écologique. Tant la protection de la biodiversité que la promotion d'un développement durable gagneraient à ce que l'on trouve un moyen réalisable d'élargir cet inventaire afin de couvrir davantage de projets connus et d'établir un bilan périodique.
2. Les avantages potentiels d'une diffusion à grande échelle des informations sur les projets de réseaux écologiques plaident pour la création d'une banque de données mondiale en ligne. Ceci offrirait l'avantage supplémentaire de permettre une mise à jour continue dès que de nouvelles informations sont disponibles.
3. Comme la plupart des projets en sont encore à l'état d'ébauche, il serait intéressant d'analyser les différentes méthodes qui ont été ou sont mises au point pour créer des réseaux écologiques et de mettre les résultats à la disposition des nombreux groupes travaillant à la création de réseaux dans le monde entier.
4. Seul un nombre limité de réseaux écologiques en sont à un stade relativement avancé de mise en œuvre sur le terrain. Il sera essentiel, en temps opportun, de soumettre l'expérience acquise dans la mise en œuvre de réseaux à un examen critique et de propager les résultats de cette évaluation.
5. Bien que l'on connaisse plusieurs projets de réseaux écologiques dans des pays en voie de développement, ceux-ci n'étaient pas en mesure de fournir les informations nécessaires pour cet inventaire. Par conséquent, il est recommandé d'entreprendre des démarches pour rassembler des renseignements supplémentaires sur ces projets et de les publier, en bonne et due forme, principalement pour les groupes travaillant dans ces pays.
6. Comme la majorité des projets de réseaux sont élaborés indépendamment l'un de l'autre, il pourrait être précieux de créer une interconnexion entre des réseaux proches et par là, de créer des constellations de réseaux sur une plus grande échelle.

Este informe comprende un análisis de 38 iniciativas de redes ecológicas que están siendo desarrolladas o implementadas actualmente. Incluye un inventario de toda una serie de proposiciones, planes y programas continuos para establecer redes ecológicas a una escala que varía de regional a intercontinental, así como los resúmenes de los resultados de los principales aspectos de los proyectos.

El informe pretende ser una contribución al análisis de las experiencias adquiridas por la UICN en el desarrollo y la aplicación de las redes ecológicas, análisis que se inició a través de una resolución adoptada en el Congreso Mundial de Conservación celebrado en 1996.

Para los fines del estudio, se considera una red ecológica como un sistema coherente de elementos de paisaje naturales y/o semi-naturales, que es formado y manejado con el objetivo de mantener o restaurar las funciones ecológicas como medio para conservar la biodiversidad, creando al mismo tiempo oportunidades apropiadas para el uso sostenible de los recursos naturales.

Se usan diferentes nombres para describir este amplio enfoque, siendo los más comunes: la red ecológica, la red de reservas, la planificación bioregional y la conservación ecoregional.

Sin embargo, todos los modelos se caracterizan por los cinco elementos clave:

- ▶ concentrarse en conservar la biodiversidad a nivel del ecosistema, el paisaje o la región
- ▶ poner énfasis en mantener o fortalecer la coherencia ecológica, principalmente manteniendo la conexión ecológica interactiva
- ▶ asegurar la protección de las áreas críticas contra los efectos de posibles actividades externas perjudiciales
- ▶ restaurar ecosistemas degradados donde sea necesario
- ▶ promocionar la complementariedad entre los objetivos del uso de la tierra y los de la conservación de la biodiversidad; principalmente mediante la explotación del valor potencial de la biodiversidad de las áreas paisajísticas asociadas semi-naturales.

En un principio se identificaron como redes ecológicas 119 iniciativas. Durante el estudio, este número ascendió hasta más de 150. Posteriormente se comparó información detallada de 38 de estas redes: 17 redes internacionales, 10 redes nacionales en desarrollo y 11 redes sub-nacionales. En términos de distribución geográfica, ocho de las redes son iniciativas intercontinentales, veinticinco se encuentran en Europa, dos en América del Norte, una en América del Sur, una en Asia y una en Australia. La fuerte tendencia hacia las redes europeas es primariamente el resultado combinado de la existencia de relativamente muchas redes ecológicas en Europa y la buena acogida de estas iniciativas.

De las 38 estructuras, 13 han llegado a la fase de implementación del programa, aunque ninguna había sido implementada por completo en el momento de escribir este informe. Para todas las iniciativas, menos cinco, se prepararon o se estaba preparando un plan detallado. Había un equilibrio virtual entre las redes que habían sido iniciadas por las organizaciones gubernamentales y las iniciadas por las organizaciones no-gubernamentales.

Los objetivos formulados por las diferentes iniciativas pueden ser divididos en seis objetivos generales:

- ▶ la conservación de las especies
- ▶ la conservación de los hábitats
- ▶ la conservación de los procesos ecológicos y evolutivos
- ▶ promover el uso sostenible de los recursos naturales
- ▶ promover el desarrollo sostenible
- ▶ conservar la herencia cultural (incluyendo la cultura indígena).

Prácticamente, todas las iniciativas pretenden conservar las especies y los hábitats y la mayoría también pretende promover el uso sostenible de los recursos naturales. Menos corrientes como objetivo explícito son la conservación de los procesos ecológicos y evolutivos y la conservación de la herencia cultural.

Con excepción de las iniciativas intercontinentales y las iniciativas internacionales más grandes, que cubren una amplia gama de zonas climáticas y phytogeográficas/vegetales y ecosistemas, la mayoría de las redes está ubicada entera o parcialmente en zonas climáticas calientes y húmedas, principalmente templadas. No obstante, las zonas climáticas más importantes están representadas en por lo menos una red. En cuanto a los ecosistemas, todos los tipos están representados en las redes, aunque los ecosistemas costales y pelágicos son mucho menos comunes.

Un resultado notable del inventario es que todas las iniciativas que tenían acceso a la información respecto al contexto socio-económico de las redes, explícitamente incorporan las actividades económicas en su planificación. Efectivamente, la mayoría de las redes abarca una amplia variedad de usos de la tierra: de éstas, las más comunes son las diferentes formas de agricultura. Solamente una tercera parte de las iniciativas incorpora explícitamente la conservación de los valores culturales en su misión, es decir, la conservación de paisajes culturales y sitios históricos, y la asistencia a los pueblos indígenas.

Casi la mitad de las redes fue iniciada por grupos sociales, sobre todo organizaciones ecológicas o institutos de investigación aplicada. Sucesivamente, la mitad de estas iniciativas ha logrado conseguir el apoyo del gobierno en el desarrollo y la implementación de las redes. Junto con las redes apoyadas por el gobierno, solamente nueve de las iniciativas están actualmente sin forma ninguna de apoyo gubernamental. Sin embargo, la mayoría de las redes todavía se encuentra en la fase de planificación y ninguna ha sido aún completamente implementada. Algunas de ellas serán realizadas dentro de un plazo de cinco años, aunque para la mayoría es más probable contar con unos 10-20 años más.

Se puede llegar a tres conclusiones clave partiendo de la información presentada en el informe:

1. Queda claro el uso, cada vez más frecuente, de un modelo genérico en la tarea de la conservación de la biodiversidad, que se está aplicando en diferentes circunstancias medioambientales y socio-económicas, a diferentes niveles y a través de organizaciones gubernamentales y no-gubernamentales.
2. Prácticamente todas las redes tienen el doble enfoque de conservar la biodiversidad y adaptar, hasta cierto grado, la explotación de los recursos naturales. Las necesidades de los países desarrollados y de los países en vías de desarrollo, impulsan la reconciliación del uso sostenible de los recursos naturales y la conservación de la biodiversidad. En los países desarrollados, las mejores posibilidades para mejorar

la conservación de la biodiversidad, generalmente están dentro de los hábitats semi-naturales extensivos, que podrían beneficiarse enormemente de las acciones tomadas para promover maneras compatibles de uso de la tierra o para desarrollar proyectos de restauración de la naturaleza. En los países en vías de desarrollo y los países en transición se pone cada vez más énfasis en estrategias que pueden satisfacer las necesidades económicas legítimas de los pueblos perjudicados a través de formas de desarrollo sostenibles que respetan la integridad de muchos y extensivos ecosistemas originales.

3. El grado en que las redes ecológicas logran asegurar el nivel deseado de compatibilidad entre la explotación de los recursos naturales y la conservación de la biodiversidad, no ha sido mostrado todavía: muy pocas redes han pasado a una fase avanzada de implementación, por lo que las oportunidades de mostrar los resultados de conservación que pueden ser logrados en la práctica aplicando el modelo de la red, son muy limitadas. Sin embargo, el hecho de que existan tantas iniciativas ecológicas de la red en desarrollo, y que este número esté creciendo rápidamente, indica que los iniciadores están convencidos de, a largo plazo, poder aprovechar de los beneficios que promete este enfoque.

Estas observaciones llevan a algunas sugerencias en cuanto a las consecuencias de este informe para llevar a cabo más acciones con el fin de evaluar el valor del modelo de la red ecológica:

1. Aunque el resumen incluye por primera vez información sistemática sobre la cantidad relativamente grande de redes ecológicas, el número, aún más elevado, de redes que hace poco se están desarrollando, representa una enorme reserva de conocimiento y experiencia en el desarrollo y la aplicación del modelo ecológico de la red. Tanto la conservación de la biodiversidad como el desarrollo sostenible podrían beneficiarse de manera considerable si se encontrara una manera práctica de ampliar este inventario para poder cubrir más iniciativas conocidas y para introducir un proceso de evaluación periódico.
2. Los beneficios potenciales que surgen de la amplia difusión de la información sobre las iniciativas, aboga por la creación de una base de datos global en Internet. Tal facilidad ofrecería la ventaja adicional de actualizar continuamente la información disponible.
3. Ya que la mayor parte de las redes ecológicas todavía se encuentra en la fase de planificación, sería beneficioso analizar los diferentes métodos ecológicos que han sido desarrolladas y que se están desarrollando ahora mismo y poner los resultados a disposición de los grupos que trabajan en las redes en todo el mundo.
4. Solamente algunas de las redes ecológicas han llegado hasta el punto en que la implementación práctica es relativamente avanzada. Por eso, es muy importante que en un momento adecuado se examine críticamente la experiencia adquirida en el proceso de implementación de las redes y se hagan conocer los resultados de esta evaluación.
5. Aunque se conocen diferentes iniciativas de redes ecológicas en los países en vías de desarrollo, estas iniciativas no tenían la posibilidad de facilitar la información necesaria para este análisis. Por eso se recomienda hacer el esfuerzo de recopilar información sobre estas iniciativas y ponerla a disposición, en una forma adecuada, especialmente de los grupos que trabajan en países en vías de desarrollo.
6. Debido a que la mayoría de las iniciativas de las redes se están desarrollando independientemente la una de la otra, es muy probable que haya un valor sustancial en la creación de una interconectividad entre las futuras redes, desarrollando así constelaciones de redes a mayor escala.

1 INTRODUCTION

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The conservation of biodiversity has in recent years been confronted with two crucial challenges: first, the need to develop environmental management approaches that are effective in conserving biodiversity and, second, the need to accommodate the exploitation of natural resources where this is necessary to meet legitimate socio-economic needs. Efforts to meet these challenges have encouraged the development of models that extend the scope of conservation actions beyond the traditional emphasis on the protection of threatened species and valuable sites. Significantly, despite the wide diversity of situations, means and perspectives in which conservation actions are being taken, two generic goals can be discerned in many of the newer approaches, namely (1) a focus on maintaining the functioning of ecosystems as a means of facilitating the conservation of species and habitats and (2) promoting the sustainable use of natural resources in order to reduce the impacts of human activities on biodiversity (or to increase the biodiversity value of man-managed landscapes¹).

Various operational models have been devised to meet these generic goals. These models are known by a variety of appellations. Most common are ecological network, reserve network, bioregional planning and ecoregion-based conservation. To some extent these terms represent differences in scope or emphasis of the different models. However, all of these models aim to achieve the two generic goals noted above and can therefore be regarded as comparable approaches to the conservation of biodiversity. In this report, 'ecological network' will be used as a generic term to refer to this broad category of conservation model. The use of a single term should not be understood as indicating a preference for a particular model, rather as a matter of convenience and also as a reflection of the terminology used by IUCN, which is giving special attention to this approach in its efforts to conserve biodiversity.

Indeed, IUCN, recognising the potential value of these approaches as a means of improving the conservation of biodiversity, adopted at the 1996 World Conservation Congress a resolution on ecological networks that:

- ▶ called on all IUCN members to further the development of ecological networks at national, regional and intercontinental level as a means of strengthening the integrity and resilience of the world's biological diversity
- ▶ requested the Director General to prepare a review of experience in developing and applying ecological networks, to promote cooperation in the further development of ecological networks at regional and international level – with a special focus on ecosystems and species that extend across national frontiers – and to report on these issues to the next World Conservation Congress (held in Jordan in October 2000²).

This report is intended as a contribution to the review of experience. It comprises an inventory of a wide range of proposals, plans and ongoing programmes to establish ecological networks that are currently being developed or implemented. The information, drawn in all cases from original sources, is presented in standardised form. Summary findings on the main features of the various initiatives are also presented.

¹ Unless explicitly indicated, the term landscape is used throughout this document to include aquatic areas.

² See Appendix 1 for the full text of the resolution.

2.1 The Development of the Model

The development of the ecological network model has its origins in the growing awareness amongst those actively involved in the conservation of biodiversity that:

- ▶ the protection of individual biological elements – predominantly a limited number of exceptionally valuable natural areas and threatened species – was not succeeding in arresting the decline in the integrity of the protected areas and many species populations
- ▶ the viability of species populations is dependent on the existence of a particular complex of environmental elements and processes rather than on its simple isolation from human influences
- ▶ the increasing extent and intensity of human activities in the landscape and their impact on biodiversity cannot be compensated through site protection measures alone.

Out of this awareness grew both a specific field of research – conservation biology³ – and various field projects which established the foundations on which the present array of initiatives are based. Prominent among these are five main groups of initiatives:

- ▶ UNESCO's 1974 Man and Biosphere Programme, which recognised the need to reconcile the conservation of valuable areas with local land-use needs through the delineation in Biosphere Reserves (currently over 350) of core areas, buffer areas and transition zones⁴
- ▶ flyway and corridor programmes that primarily aim to meet the needs of migratory species or those which need to disperse over large areas (for example, the 1979 Bonn Convention,⁵ the Western Hemisphere Shorebird Reserve Network and the Naya Conservation Corridor)
- ▶ ecological networks, which developed in Europe in the 1970s and 1980s where a strong land-use planning tradition had created the institutional environment for allocating functions at the landscape scale (for example, the Estonian Network of Ecologically Compensating Areas, the Dutch Ecological Network and the Pan-European Ecological Network)⁶
- ▶ reserve networks, which were developed in North America in the 1980s, primarily with the aim of conserving biodiversity at the regional scale (for example, the Wildlands Project and the Main Wildlands Reserve Network)⁷
- ▶ bioregional planning, which has been developed primarily by the World Resources Institute in the US and focuses on the process of planning and managing the protection of ecosystem services and biodiversity at the bioregional scale (for example, the Klamath/Siskiyou Bioregion and the St. Elias-Northern Borders Bioregion)⁸
- ▶ ecoregion-based conservation, which is a WWF initiative aimed at conserving the world's key ecoregions, that is, relatively large units of land or water that harbour a characteristic set of species, communities, dynamics and environmental conditions (for example, the Global 200 and the Carpathian Ecoregion Initiative).⁹

At the strategic level, all these initiatives aim to ensure that (1) ecological functions are maintained and (2) natural resources are used sustainably. And although the emphasis of the initiatives varies, a number of elements can be discerned which are common to all the approaches. These are:

3 See, for example, Soulé, M.E. 1986. *Conservation Biology: the Science of Scarcity and Diversity*. Sunderland, Massachusetts: Sinauer Associates.

4 UNESCO, 1974. Task Force on Criteria and Guidelines for the choice and Establishment of Biosphere Reserves. Man and the Biosphere Report No. 22. Paris: UNESCO.

5 For an overview of the convention and the seven specific agreements see G. Bennett. 2000. *Guidelines on the Application of Existing International Instruments in Developing the Pan-European Ecological Network*, Strasbourg: Council of Europe.

6 For an overview of experience in developing ecological networks in Europe see Nowicki, P. et al. (eds.). 1996. *Perspectives on Ecological Networks*. Tilburg: European Centre for Nature Conservation.

7 See, for example, Noss, R.F. and Cooperrider, A.Y. 1994. *Saving Nature's Legacy: Protecting and Restoring Biodiversity*. Washington DC: Island Press, Soulé, M.E. and Terborgh, J. (eds.). 1999. *Continental Conservation: Scientific Foundations of Regional Reserve Networks*. Washington DC: Island Press.

8 See, for example, Miller, K. 1996. *Balancing the Scales: Guidelines for Increasing Biodiversity's Chances through Bioregional Management*. Washington DC: World Resources Institute.

9 See, for example, WWF. 2000. *A Workbook for Conducting Biological Assessments and Developing Biodiversity Visions for Ecoregion-Based Conservation*, WWF Conservation Science Programme.

- ▶ a focus on conserving biodiversity at the ecosystem, landscape or regional scale
- ▶ an emphasis on maintaining or strengthening ecological coherence, primarily through providing for ecological interconnectivity
- ▶ ensuring that critical areas are buffered from the effects of potentially damaging external activities
- ▶ restoring where appropriate degraded ecosystems
- ▶ promoting complementarity between land uses and biodiversity conservation objectives, and particularly by exploiting the potential biodiversity value of associated semi-natural landscapes.

These approaches do not, therefore, stake a claim to the landscape in a way that fences off the entire countryside from all human activities. They aim, rather, to focus conservation action on those areas and on those species communities that harbour environmental values which are crucial to the maintenance of ecological functions and, in the long term, to human welfare and also to delineate human activities in such a way that they are both economically viable and ecologically sustainable.

Although the first manifestations of the ecological network model date from the 1970s, it is only during the past decade that the approach has attracted sufficient attention and credibility to become widely applied. Today, well over a hundred examples of proposals, plans or projects for ecological networks are known to be under development or in course of implementation. These initiatives can be found on all continents, in a wide range of biogeographic zones and in landscapes varying from highly exploited to virtually pristine. Indeed, although originally conceived as a means of reconciling the needs of biodiversity conservation with those of economic development in man-exploited landscapes in the developed countries, recent years have seen increased attention for the potential value of the model in the developing countries where there is an urgent need to secure sustainable development in regions characterised by a rich biodiversity and economically valuable natural resources, but where local populations are dependent for their welfare on the continued functioning of ecosystems.

2.2 The Operational Scope of the Model for the Purposes of the Inventory

In order to be able to select initiatives for inclusion in the inventory, an operational definition of an ecological network had to be formulated. Thus, for the purposes of the study, an ecological network can be regarded as:

A coherent system of natural and/or semi-natural landscape elements that is configured and managed with the objective of maintaining or restoring ecological functions as a means to conserve biodiversity while also providing appropriate opportunities for the sustainable use of natural resources.

Note that, as discussed above, this definition has two key components: the maintenance of ecological functions as a means of conserving biodiversity and the sustainable use of natural resources. An ecological network aims to achieve these twin objectives by creating an infrastructure that facilitates ecological functioning but also accommodates a degree of human exploitation of the landscape where this is compatible with, or contributes to, the conservation of biodiversity.

One of the most interesting aspects of the ecological network model is the variety of scales at which it is being applied. The majority of networks described in this review are being applied to a geographical region, such as a watershed, a mountain range or a natural community; in many of the cases where the initiative is part of government policy or planning, the region may be delineated by a sub-national administrative unit or an entire country. However, the model is also being used to frame conservation actions at both lower and higher scales. At one extreme, networks are being developed to conserve biodiversity at the local level, such as the many municipal projects in Denmark and the Netherlands. At the other extreme are cases where the model has been used as the basis for a strategic approach to biodiversity conservation at the supra-continental scale, such as the Pan-European Biological and Landscape Diversity Strategy for the Eurasian region and the Western Hemisphere Shorebird Reserve Network.

There are also several examples where networks at different scales are being integrated into a coherent whole, such as in Europe where the development of the Pan-European Ecological Network was not only inspired by examples of ecological networks developed at the local, national and regional scale but in turn is inspiring a number of European countries to develop national networks within the pan-European framework.

This diversity of scales is reflected to an important extent in the inventory, although for reasons of practicability no local networks have been included. One complication that follows from this diversity is that the different character of initiatives taken at local, regional and supra-regional scale – in terms of the level of detail, the range of biodiversity to be conserved and the implementing frameworks – limits the extent to which direct comparison between different initiatives is feasible. On the other hand, the variety of scales at which ecological networks are being applied is indicative of the potential value of the model in terms of biodiversity conservation and the sustainable use of natural resources.

3 THE INVENTORY

3.1 Design of the Inventory

The information presented in this report is intended to provide a succinct picture of all relevant aspects of as wide a range of ecological networks as possible. Potentially relevant initiatives were identified on the basis of information that was already available to the project team and through an IUCN network mailing. Each potentially relevant initiative was contacted and requested to complete and return a questionnaire if it was determined that the initiative fell within the scope of the review. In some cases where the respondents were not in a position to provide the information, the project team collated the relevant information from original sources. The information requested included, as far as possible, details on the following topics:

- ▶ General information on the initiative:
 - the geographical location and extent of the network
 - the organisations involved in the initiative
 - the strategic and specific objectives of the initiative
 - the physical configuration of the network.
- ▶ Environmental characteristics of the network:
 - the main environmental units within which the network is located
 - the major ecosystems which are the focus of the network
 - the ecological and environmental objectives of the network.
- ▶ The natural resources exploited in the network.
- ▶ The main conflicts and opportunities associated with the development of the network.
- ▶ Institutional aspects of the plan or proposal:
 - details of the plan or proposal
 - the institutional and legal framework for the initiative
 - the data used in the initiative
 - related research
 - budget, resources and funding
 - the planning schedule
 - other relevant information.

Not all of the respondents were in a position to supply all of the requested information. In some cases the response was therefore limited to the provision of basic information on the initiative.

3.2 The Ecological Networks Described in the Inventory

On the basis of existing information and the use of the IUCN network, 119 initiatives were originally identified as ecological networks as defined for the purposes of the review. The locations of these initiatives were as follows:

Table 1 The location of the known ecological network initiatives

| Continent | Number of networks | Percentage of total |
|------------------|---------------------------|----------------------------|
| Intercontinental | 10 | 9% |
| Europe | 42 | 35% |
| North America | 29 | 25% |
| South America | 16 | 13% |
| Asia | 12 | 10% |
| Africa | 5 | 4% |
| Australasia | 5 | 4% |
| Total | 119 | 100% |

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From this total, information was collated on 38 ecological networks, as follows:

Table 2 The ecological networks included in the inventory

| | Ecological network | Location |
|-------|--|--|
| 1 | Global 200 Programme | Global |
| 2 | Pan-European Ecological Network | Europe & Asia |
| 3 - 9 | Bonn Convention: 7 agreements | Europe & Asia |
| 10 | Western Hemisphere Shorebird Reserve Network | North & South America |
| 11 | Ecological Corridor of the Americas | North & South America |
| 12 | Mesoamerican Biological Corridor | Central America |
| 13 | East Asian-Australasian Shorebird Site Network | East Asia & Australasia |
| 14 | Natura 2000 | European Union |
| 15 | European Coastal and Marine Ecological Network | Western Europe |
| 16 | Carpathian Ecoregion Initiative | Czech Republic, Hungary, Poland, Romania, Slovakia & Ukraine |
| 17 | Transnational Ecological Network | Netherlands, Germany & Denmark |
| 18 | Wallonian Ecological Network | Belgium (Wallonia) |
| 19 | Interwoven Biotope System | Germany (Rhineland-Palatinate) |
| 20 | PLANECO Project | Italy (Central Appenines) |
| 21 | Netherlands Ecological Network | Netherlands |
| 22 | Swiss National Ecological Network | Switzerland |
| 23 | Cheshire ECONet | United Kingdom (Cheshire) |
| 24 | Forest Habitat Network | United Kingdom (Scotland) |
| 25 | Network of Ecologically Compensating Areas | Estonia |
| 26 | Hungarian National Ecological Network | Hungary |
| 27 | ECONET–Poland | Poland |
| 28 | Romanian National Network | Romania |
| 29 | Territorial System of Ecological Stability | Slovakia |
| 30 | Econetwork | Moldova |
| 31 | Heart of Russia | Russia (Central Russia) |
| 32 | Ecological Network of the Orenbourg Region | Russia (Orenbourg) |
| 33 | Volga-Ural ECONET | Russia (Volga/Ural) |
| 34 | Ukrainian National Ecological Network | Ukraine |
| 35 | Conception Coast Project | United States (California) |
| 36 | Maine Wildlands Reserve Network | United States (Vermont) |
| 37 | Naya Conservation Corridor | Colombia (Naya watershed) |
| 38 | National Reserve System Program | Australia |

Of these 38 initiatives, 17 are international networks, 10 are national in scope and 11 are sub-national. In terms of geographical distribution, eight of the networks are intercontinental initiatives, 25 are located in Europe, two in North America, one in South America, one in Asia and one in Australia. The strong bias towards European networks is primarily the combined result of the relatively large number of ecological networks in Europe and the high response rate from these initiatives. The high rate of response can in all probability be attributed to the fact that, in contrast to the other continents, many of the European networks are the initiative of government organisations, which in general responded more readily to the questionnaire than non-governmental and private organisations.

3.3 Summary Findings

3.3.1 The Status of the Initiatives

Any programme to develop and establish an ecological network will proceed through several phases. The first key step is to identify the need for such a network. On the basis of the information collected, it would seem that many of the known initiatives are currently still in this initial phase and have not yet proceeded to become operational programmes. Of the 38 networks that are described in this review, a further three phases were distinguished, as follows (see Table 3):

- ▶ a strategic proposal, which may or may not include an indicative map of the proposed network
- ▶ a detailed plan, in which the biodiversity elements to be conserved are identified, the scope for other land uses is clarified and the spatial configuration of the network is determined, usually in map form
- ▶ an implementing programme, in which the specific actions, actors, management requirements and instruments are laid down.

Table 3. The status of the ecological networks

| | Ecological network | Status | | | Organisation |
|-----|--|----------|------|-----------|--------------|
| | | Proposal | Plan | Programme | |
| 1 | Global 200 Programme | • | > | | NGO |
| 2 | Pan-European Ecological Network | • | > | | Govt. |
| 3-9 | Bonn Convention: 7 agreements | • | • | > | Govt. |
| 10 | Western Hemisphere Shorebird Reserve Network | • | • | > | NGO |
| 11 | Ecological Corridor of the Americas | • | | | NGO |
| 12 | Mesoamerican Biological Corridor | • | • | > | Govt./NGO |
| 13 | East Asian-Australasian Shorebird Site Network | • | • | > | NGO |
| 14 | Natura 2000 | • | • | > | Govt. |
| 15 | European Coastal and Marine Ecological Network | • | > | | NGO |
| 16 | Carpathian Ecoregion Initiative | • | > | | NGO |
| 17 | Transnational Ecological Network | > | | | NGO |
| 18 | Wallonian Ecological Network | • | > | | Govt. |
| 19 | Interwoven Biotope System | • | • | > | Govt. |
| 20 | PLANEKO Project | > | | | NGO |
| 21 | Netherlands Ecological Network | • | • | > | Govt. |
| 22 | Swiss National Ecological Network | > | | | Govt. |
| 23 | Cheshire EConet | • | > | | Govt. |
| 24 | Forest Habitat Network | • | > | | Govt. |
| 25 | Network of Ecologically Compensating Areas | • | • | > | Govt. |
| 26 | Hungarian National Ecological Network | • | > | | Govt. |
| 27 | ECONET–Poland | • | > | | NGO |
| 28 | Romanian National Network | • | > | | Govt. |
| 29 | Territorial System of Ecological Stability | • | • | > | Govt. |
| 30 | Econetwork | • | > | | NGO |
| 31 | Heart of Russia | • | > | | NGO |
| 32 | Ecological Network of the Orenbourg Region | • | • | > | Govt./NGO |
| 33 | Volga-Ural ECONET | • | • | > | Govt./NGO |
| 34 | Ukrainian National Ecological Network | • | • | > | Govt. |
| 35 | Conception Coast Project | • | > | | NGO |
| 36 | Maine Wildlands Reserve Network | • | | | NGO |
| 37 | Naya Conservation Corridor | • | > | | NGO |
| 38 | National Reserve System Program | • | • | > | Govt. |

Legend • completed > in progress

Of the 38 networks, 13 have progressed to the stage of an implementing programme, although none had been fully implemented at the time of writing. A detailed plan was being, or had been, prepared for all but five of the initiatives.

With regard to the type of organisation which was leading each initiative, two broad categories can be distinguished, namely governmental and non-governmental. For the purposes of the inventory, non-governmental organisations include, in addition to environmental organisations, research institutes, independent resource management agencies and commercial enterprises. Table 3 lists the type of organisation that is the prime mover in each initiative. Although in most cases only one type of organisation is listed, the majority of initiatives are of such scope that a wide range of organisations are involved in developing, elaborating and implementing the programmes. Interestingly, there is a virtual balance between the networks that have been initiated by governmental organisations (15) and those by non-governmental organisations (14).

3.3.2 The Objectives of the Initiatives

Six generic objectives can be distinguished in the 38 initiatives. These objectives are not necessarily formulated precisely in the terms below, but can be regarded as being equivalent to or inferring these objectives. The six objectives are:

Table 4 The objectives of the ecological networks

| | Ecological Network | Objectives |
|-----|--|-------------------|
| 1 | Global 200 Programme | 1, 2, 3 |
| 2 | Pan-European Ecological Network | 1, 2, 3, 4 |
| 3-9 | Bonn Convention: 7 agreements | 1, 2 |
| 10 | Western Hemisphere Shorebird Reserve Network | 1, 2 |
| 11 | Ecological Corridor of the Americas | 1, 2, 4, 6 |
| 12 | Mesoamerican Biological Corridor | 1, 2, 4 |
| 13 | East Asian-Australasian Shorebird Site Network | 1, 2 |
| 14 | Natura 2000 | 1, 2 |
| 15 | European Coastal and Marine Ecological Network | 1, 2 |
| 16 | Carpathian Ecoregion Initiative | 1, 2, 3, 4, 5 |
| 17 | Transnational Ecological Network | 2 |
| 18 | Wallonian Ecological Network | 1, 2, 4 |
| 19 | Interwoven Biotope System | 1, 2, 4, 6 |
| 20 | PLANECO Project | 1, 2 |
| 21 | Netherlands Ecological Network | 1, 2, 3, 4 |
| 22 | Swiss National Ecological Network | 1, 2, 4 |
| 23 | Cheshire EConet | 1, 2, 4, 5 |
| 24 | Forest Habitat Network | 2, 4 |
| 25 | Network of Ecologically Compensating Areas | 2, 3, 4, 6 |
| 26 | Hungarian National Ecological Network | * |
| 27 | ECONET–Poland | 1, 2, 3, 5 |
| 28 | Romanian National Network | * |
| 29 | Territorial System of Ecological Stability | 1, 2, 3, 4 |
| 30 | Econetwork | 1, 2, 4 |
| 31 | Heart of Russia | 1, 2, 4 |
| 32 | Ecological Network of the Orenbourg Region | 1, 2, 6 |
| 33 | Volga-Ural ECONET | 1, 2, 4 |
| 34 | Ukrainian National Ecological Network | 1, 2, 4, 6 |
| 35 | Conception Coast Project | 1, 2, 3, 4 |
| 36 | Maine Wildlands Reserve Network | 1, 2, 3, 4 |
| 37 | Naya Conservation Corridor | 1, 2, 5, 6 |
| 38 | National Reserve System Program | 1, 2, 4, 6 |

Legend

1 = conservation of species

2 = conservation of habitats

3 = conservation of ecological and evolutionary processes

4 = facilitating sustainable use

5 = facilitating sustainable development

6 = conservation of cultural heritage

* = under development

- ▶ the conservation of species
- ▶ the conservation of habitats
- ▶ the conservation of ecological and evolutionary processes
- ▶ facilitating the sustainable use of natural resources

- ▶ facilitating sustainable development
- ▶ the conservation of cultural heritage (including indigenous culture).

As Table 4 indicates, virtually all the initiatives aim to conserve species and habitats, and the majority also aim to facilitate the sustainable use of natural resources. Less common as explicit objectives are the conservation of ecological and evolutionary processes and the conservation of cultural heritage.

3.3.3 The Ecological and Environmental Context of the Networks

With the exception of the intercontinental and larger international initiatives, which all cover a wide range of climatic zones, phyto-geographical/vegetation zones and ecosystems, the majority of the networks are located entirely or in part in warm, humid climatic zones, primarily temperate (see Table 5). Nevertheless, all of the major climatic zones are represented in at least one network. The predominant phyto-geographical/vegetation zones in the networks are mountain vegetation, non-boreal coniferous forest, mixed coniferous/deciduous temperate forest, deciduous temperate forest and steppe. With regard to the ecosystems, all types are represented in the networks, although coastal and pelagic ecosystems are significantly less common.

3.3.4 The Socio-Economic Context of the Initiatives

A notable finding of the inventory is that all of the initiatives for which information on the socio-economic context on the networks was available explicitly incorporate economic activities in their planning. Indeed, most networks encompass a wide range of land uses: most common are various types of farming, but recreation, habitation and infrastructure works are also widespread. Only about a third of the initiatives explicitly incorporate the conservation of cultural values into their mission, namely the conservation of cultural landscapes and historic sites and provision for indigenous peoples.

Table 5. The ecological and environmental context of the ecological networks

| | Ecological Network | Ecological & Environmental Context | | |
|----|---|------------------------------------|---|-----------------------|
| | | Climatic Zones | Phyto-Geographical/ Vegetation Zones | Ecosystems |
| 24 | 1 Global 200 Programme | * | * | * |
| | 2 Pan-European Ecological Network | * | * | * |
| | 3-9 Bonn Convention: 7 agreements | * | * | * |
| | 10 Western Hemisphere Shorebird Reserve Network | * | * | * |
| | 11 Ecological Corridor of the Americas | * | * | * |
| | 12 Mesoamerican Biological Corridor | 1, 2, 3 | a, g, l, n, p | i, ii, iii, iv, v |
| | 13 East Asian-Australasian Shorebird Site Network | * | * | iv, v |
| | 14 Natura 2000 | * | * | * |
| | 15 European Coastal and Marine Ecological Network | * | * | v |
| | 16 Carpathian Ecoregion Initiative | 3, 4 | * | i, ii, iii |
| | 17 Transnational Ecological Network | 3 | f | ii, iv |
| | 18 Wallonian Ecological Network | 3 | f | i, ii, iv |
| | 19 Interwoven Biotope System | 3 | f | i, ii, iv, vii |
| | 20 PLANECO Project | 3 | a | iii, iv |
| | 21 Netherlands Ecological Network | 3 | f | i, ii, iv, v, vii |
| | 22 Swiss National Ecological Network | 3, 4 | * | * |
| | 23 Cheshire EConet | 3 | f | i, ii, iii, iv |
| | 24 Forest Habitat Network | 3 | e, f | * |
| | 25 Network of Ecologically Compensating Areas | 3 | d | i, ii, iv, v, vi, vii |
| | 26 Hungarian National Ecological Network | 3 | * | * |
| | 27 EConet-Poland | 3 | a, e | i, ii, iii, v, vii |
| | 28 Romanian National Network | 3 | a, d, e, f, j | i, ii, iii, iv, v |
| | 29 Territorial System of Ecological Stability | 3 | a, d, e, f, j | * |
| | 30 Econetwork | 3 | f, j | i, ii, iv |
| | 31 Heart of Russia | 4 | c, d, e, f, j | i, ii, iv |
| | 32 Ecological Network of the Orenbourg Region | * | j | i, ii, iii, iv |
| | 33 Volga-Ural EConet | 4 | a, c, d, e, f, j | i, ii, iii, iv |
| | 34 Ukrainian National Ecological Network | 3 | a, d, e, f, g, j | i-vii |
| | 35 Conception Coast Project | 3 | * | * |
| | 36 Maine Wildlands Reserve Network | 4 | a, b, c, d, e | i, ii, iii, iv, v |
| | 37 Naya Conservation Corridor | 1 | a, l | i |
| | 38 National Reserve System Program | 1, 2, 3, 4 | a, e, f, g, k, l, m, n, o, q | * |

Legend

Climatic Zones

- 1 = Tropical, rainy climate
- 2 = Dry climate
- 3 = Warm, temperate, rainy climate
- 4 = Cool, snow-forest climate
- 5 = Polar climate

Phyto-Geographical/Vegetation Zones

- a = Mountain vegetation
- b = Tundra
- c = Boreal forest (taiga)
- d = Non-Boreal coniferous forest
- e = Mixed coniferous/deciduous temperate forest
- f = Deciduous temperate forest
- g = Mediterranean scrub formations
- h = Prairie (long grass)
- j = Steppe (short grass)
- k = Savanna and woodland
- l = Tropical rainforest
- m = Monsoon forest (deciduous)
- n = Dry tropical forest (semi-deciduous)
- o = Subtropical forest
- p = Shrub and thorn formations of dry tropics
- q = Desert vegetation

Ecosystems

- i = Forest
- ii = Grassland
- iii = Mountain systems
- iv = Inland waters and wetlands
- v = Coastal ecosystems
- vi = Pelagic (marine) ecosystems
- vii = Other

* = large number or not specified

Table 6. The land uses and cultural values associated with the ecological networks

| | Ecological Network | Land Uses | Cultural Values |
|-----|--|------------------------|------------------------|
| 1 | Global 200 Programme | * | * |
| 2 | Pan-European Ecological Network | 1-9 | a |
| 3-9 | Bonn Convention: 7 agreements | * | * |
| 10 | Western Hemisphere Shorebird Reserve Network | * | * |
| 11 | Ecological Corridor of the Americas | 1-9 | a, b, c |
| 12 | Mesoamerican Biological Corridor | 1-9 | * |
| 13 | East Asian-Australasian Shorebird Site Network | * | * |
| 14 | Natura 2000 | * | * |
| 15 | European Coastal and Marine Ecological Network | * | * |
| 16 | Carpathian Ecoregion Initiative | 1, 2, 3, 5, 6, 7, 8, 9 | a |
| 17 | Transnational Ecological Network | 1, 2, 4, 6, 8 | * |
| 18 | Wallonian Ecological Network | 1-9 | * |
| 19 | Interwoven Biotope System | 1, 2, 3, 4, 6, 7, 8, 9 | a |
| 20 | PLANEKO Project | * | * |
| 21 | Netherlands Ecological Network | 1, 2, 3, 4, 6, 7, 8, 9 | a |
| 22 | Swiss National Ecological Network | * | * |
| 23 | Cheshire EONet | 1-9 | * |
| 24 | Forest Habitat Network | 1-9 | * |
| 25 | Network of Ecologically Compensating Areas | 1-9 | * |
| 26 | Hungarian National Ecological Network | * | * |
| 27 | ECONET–Poland | 1, 3, 4, 5, 6, 7, 8, 9 | * |
| 28 | Romanian National Network | 1-9 | * |
| 29 | Territorial System of Ecological Stability | 1-9 | b |
| 30 | Econetwork | 1, 2, 3, 4, 6, 7, 8, 9 | a, b |
| 31 | Heart of Russia | 1, 2, 3, 4, 6, 7, 8, 9 | a, b |
| 32 | Ecological Network of the Orenbourg Region | 1-9 | a, b |
| 33 | Volga-Ural ECONET | 1-9 | a, b |
| 34 | Ukrainian National Ecological Network | 1-9 | a, b |
| 35 | Conception Coast Project | * | * |
| 36 | Maine Wildlands Reserve Network | 3, 4, 5, 6, 7, 8, 9 | * |
| 37 | Naya Conservation Corridor | 2, 3, 7, 9 | * |
| 38 | National Reserve System Program | 1, 2, 3, 5, 6, 7, 8 | b, c |

Legend

Land Use

- 1 = Arable farming and/or horticulture
- 2 = Animal husbandry and/or rangelands
- 3 = Production forestry
- 4 = Fisheries
- 5 = Industry, mining and/or energy production
- 6 = Recreation and/or tourism
- 7 = Habitation
- 8 = Infrastructure
- 9 = Hunting

Cultural Values

- a = Cultural landscapes
- b = Historic sites
- c = Indigenous peoples

* = not precisely specified/unknown

3.3.5 Institutional and Legal Frameworks

Table 7 indicates the primary institutional means through which each ecological network is to be realised, that is to say, the type of organisation which is the prime mover in promoting the establishment of the network. Two main options are distinguished, namely a coalition of non-government societal interests, such as research institutes, environmental organisations, land owners and private foundations (but which may include governmental bodies, which is indicated where this is

applicable) or through government-driven action (that in most cases includes the funding of research, which is not regarded for the purposes of the table as an activity initiated through a societal coalition). Where the establishment of the network is also specifically required by legislation, this is also indicated (although legislation which is limited to the delineation of protected areas is not regarded as sufficient to provide for the establishment of an ecological network). Some initiatives have not yet reached the stage of securing formal commitments from other partners.

Almost half of the networks have been initiated by societal interest groups, mainly environmental organisations or applied research institutes. In turn, half of these initiatives have attracted the support of government in developing and establishing the networks. In combination with the networks that are government-driven, only nine of the initiatives are currently without any form of government support.

Table 7. The institutional framework of the ecological networks

| | Ecological Network | Coalition | Government Policy | Legislation |
|-----|--|------------------|--------------------------|--------------------|
| 1 | Global 200 Programme | • | | |
| 2 | Pan-European Ecological Network | | • | |
| 3-9 | Bonn Convention: 7 agreements | | • | • |
| 10 | Western Hemisphere Shorebird Reserve Network | • | | |
| 11 | Ecological Corridor of the Americas | • | | |
| 12 | Mesoamerican Biological Corridor | • | • | |
| 13 | East Asian-Australasian Shorebird Site Network | • | • | |
| 14 | Natura 2000 | • | • | |
| 15 | European Coastal and Marine Ecological Network | • | | |
| 16 | Carpathian Ecoregion Initiative | • | • | |
| 17 | Transnational Ecological Network | • | • | |
| 18 | Wallonian Ecological Network | | • | |
| 19 | Interwoven Biotope System | | • | |
| 20 | PLANEKO Project | • | | |
| 21 | Netherlands Ecological Network | | • | |
| 22 | Swiss National Ecological Network | | • | |
| 23 | Cheshire EONet | • | | |
| 24 | Forest Habitat Network | | • | |
| 25 | Network of Ecologically Compensating Areas | | • | • |
| 26 | Hungarian National Ecological Network | | • | |
| 27 | ECONET–Poland | • | • | |
| 28 | Romanian National Network | | • | |
| 29 | Territorial System of Ecological Stability | | • | • |
| 30 | Econetwork | • | • | |
| 31 | Heart of Russia | • | | |
| 32 | Ecological Network of the Orenbourg Region | • | • | |
| 33 | Volga-Ural ECONET | • | • | |
| 34 | Ukrainian National Ecological Network | | • | |
| 35 | Conception Coast Project | • | | |
| 36 | Maine Wildlands Reserve Network | • | | |
| 37 | Naya Conservation Corridor | • | | |
| 38 | National Reserve System Program | | • | |

3.3.6 Implementation

Given the scale and complexity of ecological networks, it is clear that their conception, design and realisation is likely to require decades rather than a few years. Even the projected date of realisation for the oldest of the initiatives in the inventory – the Estonian ecological network – is still uncertain. Of course, no network is completely designed in a single operation and fully established through a one-off implementation programme: design always proceeds from an original indicative configuration through successively more detailed and revised drafts, methodologies evolve, improved data become available, new insights emerge, the coalition of partners and stakeholders may vary over time, funding may fluctuate, the socio-economic context will change and the institutional framework may be reorganised. Table 8 should not therefore be understood as indicating fixed dates on which the design of a network is finalised or its realisation is fully completed. The design date represents the time at which a reasonably representative configuration was first determined (or is likely to be determined) and the realisation date is a prognosis for when the main elements of the network – in terms of protected or managed areas, compatible land uses or effective planning procedures – are in place.

Table 8. The implementation schedules of the ecological networks

| | Ecological Network | Design | Realisation |
|-----|--|---------------|--------------------|
| 1 | Global 200 Programme | – | – |
| 2 | Pan-European Ecological Network | 2003* | 2005 |
| 3-9 | Bonn Convention: 7 agreements | – | – |
| 10 | Western Hemisphere Shorebird Reserve Network | 1986 | – |
| 11 | Ecological Corridor of the Americas | – | – |
| 12 | Mesoamerican Biological Corridor | 1994 | – |
| 13 | East Asian-Australasian Shorebird Site Network | 1998 | 2000 |
| 14 | Natura 2000 | 2000 | 2004 |
| 15 | European Coastal and Marine Ecological Network | – | – |
| 16 | Carpathian Ecoregion Initiative | 2001 | – |
| 17 | Transnational Ecological Network | – | – |
| 18 | Wallonian Ecological Network | 2000 | – |
| 19 | Interwoven Biotope System | 1991 | – |
| 20 | PLANEKO Project | – | – |
| 21 | Netherlands Ecological Network | 1989 | 2018 |
| 22 | Swiss National Ecological Network | – | – |
| 23 | Cheshire EConet | 2001 | 2020 |
| 24 | Forest Habitat Network | 1999 | 2050 |
| 25 | Network of Ecologically Compensating Areas | 1983 | – |
| 26 | Hungarian National Ecological Network | – | – |
| 27 | ECONET–Poland | 1995 | – |
| 28 | Romanian National Network | – | – |
| 29 | Territorial System of Ecological Stability | 1992 | – |
| 30 | Econetwork | 2001 | – |
| 31 | Heart of Russia | 2001 | 2005 |
| 32 | Ecological Network of the Orenbourg Region | 1998 | – |
| 33 | Volga-Ural ECONET | 1995 | 2005 |
| 34 | Ukrainian National Ecological Network | 2000 | – |
| 35 | Conception Coast Project | – | – |
| 36 | Maine Wildlands Reserve Network | 1999 | 2100 |
| 37 | Naya Conservation Corridor | – | – |
| 38 | National Reserve System Program | 1999 | 2002 |

Legend

– = not known or not yet determined

* = estimated date

3.4 Concluding Comments

Although this review was undertaken with the sole purpose of collating and presenting in a systematic way information on a large number of ecological network initiatives, the information collected is of sufficient import to prompt a number of concluding comments.

Perhaps the most striking finding of the review is the large number of ecological networks that are being developed around the world. During the initial survey, 119 network initiatives were found that are being developed at the regional scale or higher, and during the course of the study this number increased to over 150 (and it would have been considerably greater if local networks had also been included in the review). Although it only proved feasible to collate information on 38 initiatives, the fact that such a large number of ecological networks are being developed is of considerable importance for biodiversity conservation: it is clear from the review that a generic model is being increasingly applied to the task of conserving biodiversity, and it is being applied in a wide variety of environmental and socio-economic circumstances, at different scales and by both government and non-governmental organisations.

A second notable feature of the initiatives is that virtually all the networks focus not only on the conservation of biodiversity but also accommodate to some degree the exploitation of natural resources. That is to say, serious efforts are being made both to buffer sites of high conservation value from potentially damaging forms of land use and to find ways of reconciling the exploitation of natural resources with biodiversity conservation. Common examples are the maintenance of certain forms of agriculture which have biodiversity value, such as extensive grazing, and the promotion of ecotourism. This represents a distinct departure from the traditional approach of physically segregating and protecting sites of high conservation value from areas which are predominantly exploited by various form of human exploitation. This evolution is being driven by the needs of both developed and developing countries which, although in many ways stem from contrasting challenges, lead to a common approach. In developed countries, the greatest potential for biodiversity conservation lies not in the relatively limited area of high-value natural habitats, which to a large extent are already under strict protection, but in the far more extensive semi-natural habitats which would benefit enormously from actions to promote compatible forms of land use or to develop nature restoration projects. In the developing countries, including the countries in transition, meeting the legitimate economic needs of disadvantaged populations is not compatible with the strict protection of the many and extensive pristine ecosystems that are under threat from rapid economic development, but it can be reconciled with sustainable forms of development which respect the integrity of these ecosystems.

However, the extent to which the ecological networks are succeeding in securing the desired degree of compatibility between natural resource exploitation and biodiversity conservation is not yet clear: not only are the majority of the networks covered by this review still in the planning stage, but the inventory did not provide the opportunity to study this aspect in the depth necessary to be able to draw conclusions on this issue. Indeed, the fact that so few networks have yet progressed to an advanced stage of implementation limits the opportunities to demonstrate the conservation results that can be achieved in practice through applying the network model. Currently, any such assessment would have to be based on the experience of a small number of advanced networks – which are also those that are relatively limited in geographical scale – and on fragmentary evidence drawn from the partial implementation of other networks. And even then it can be expected that the main conservation results will be achieved

over a long period rather than immediately following the establishment of a network. But the fact that so many ecological network initiatives are now underway, and that this number is rapidly increasing, suggests that the initiators are fully confident that the benefits that this approach promises can ultimately be delivered.

These observations lead to a number of suggestions concerning the implications of this study for further actions to assess the value of the ecological network model:

First, although the review presents for the first time systematic information on a relatively large number of ecological networks, the even greater number of networks currently under development and which could not be inventoried in this review represent an enormous and rapidly growing reservoir of expertise and experience in developing and applying the ecological network model. Yet this expertise and experience has not yet been made available to a broader audience. It is likely that there would be substantial benefits for both biodiversity conservation and sustainable development if a practicable means could be found to extend this inventory to cover a larger proportion of the other known initiatives and to institute a periodic review process.

Second, the need to ensure as broad as possible dissemination of the information collated through such a review process argues for the creation of a global online database to present standardised information on ecological network initiatives. Such a facility would offer the additional advantage of permitting continual updating as new information became available.

Third, most network initiatives are still at the planning stage and are being developed relatively independently of each other. This suggests that there are substantial potential benefits to be gained from analysing the various ecological network methodologies which have been or are being developed and making the results available to the many groups working on networks around the world.

Fourth, only a small number of ecological networks have progressed to the point where implementation on the ground is relatively advanced. Since it is the results that are achieved in practice that will determine the value of the network model, it is essential that action be taken at an appropriate time to examine critically the experience gained in implementing the networks and to disseminate the results of this assessment.

Fifth, although several ecological network initiatives in developing countries are known, these initiatives were not in a position to provide the information necessary for this review. Given the urgent need to develop effective strategies for biodiversity conservation and the sustainable use of natural resources in these countries, it is recommended that supplementary action be taken to collect information on these initiatives and to make it available in appropriate form, especially to the groups working in developing countries.

Finally, since the majority of network initiatives are being developed independently of each other, there could be potential value in creating interconnectivity between proximate networks. The added value in terms of biodiversity conservation that would be generated by such linkages, both as a result of physical interconnection and through the exchange of regionally specific expertise and experience, could generate an exceptionally high return in relation to the investment required. Some of the intercontinental networks covered by this review already exploit existing conservation initiatives to achieve their goals, but there would seem to be considerable scope for utilising many of the other ecological networks as building blocks to develop larger-scale constellations of networks.

APPENDIX 1. The Ecological Networks

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Note: respondents who, due to time constraints or because the respective network was insufficiently developed, were not in a position to answer the entire questionnaire were requested to provide, at a minimum, general information on the network. Unless otherwise stated, the information included is precise. Where precise information was not available, a best estimate is given and indicated by 'approx.'. The information presented is in most cases summarised to some extent from the more detailed information received.

1 Global 200 Programme

GENERAL INFORMATION ON THE NETWORK

Location of the Network

All 7 continents.

Responsible Organisation

World Wide Fund for Nature (WWF).

Main Objectives of the Network

To conserve the broadest variety of the world's species and the ecological and evolutionary processes that maintain the web of life.

Main Components of the Network

233 'ecoregions' (a relatively large unit of land or water that is characterised by distinctive climate, ecological features and plant and animal communities). Each ecoregion includes core areas, corridors and restoration areas.

Ecosystems Included in the Network

The 233 ecoregions are classified into 19 groups, as follows:

- ▶ Terrestrial ecoregions:
 - Tropical and subtropical moist broadleaf forests (53 ecoregions).
 - Tropical dry forests (10).
 - Tropical and subtropical conifer forests (2).
 - Temperate conifer and broadleaf forests (17).
 - Boreal forests and taiga (5).
 - Arctic tundra (5).
 - Temperate grasslands, savannas and shrublands (5).
 - Tropical and subtropical grasslands, savannas and shrublands (11).
 - Flooded grasslands and savannas (5).
 - Tropical montane grasslands and savannas (7).
 - Deserts and xeric shrublands (11).
 - Mediterranean shrublands and woodlands (5).
- ▶ Freshwater ecoregions:
 - Small rivers and streams (18).
 - Large rivers (6).
 - Lake and closed basin freshwater ecosystems (12).
- ▶ Marine ecoregions:
 - Large deltas, mangroves and estuaries (17).
 - Coral reefs and associated marine ecosystems (23).
 - Coastal marine ecosystems (16).
 - Polar and subpolar marine ecosystems (5).

Species Protected Through the Network

No specific species.

Natural Resources Exploited Within the Network

Varies according to region.

Relevant Government Policy

To be promoted by WWF at the ecoregion level.

Status of Network Plan

Initiated by WWF in 1997. By mid-2000 31 ecoregion projects had been initiated, as follows:

- ▶ Latin America:
 - Chihuahuan Deserts and Springs
 - Galapagos Islands
 - Northern Andean Montane Forests
 - Southwest Amazon Moist Forest
 - Valdivian Temperate Forest
 - Meso-American Caribbean Reef
 - Varzea Flooded Forests
 - Atlantic Forests
 - Pantanal
 - Sea of Cortez/Gulf of California
- ▶ Africa:
 - Congo Basin Forests
 - Zambezi Woodlands and Savannas
 - East Africa Marine
 - Fynbos
 - African Rift Valley Lakes
 - Madagascar Dry Forest
 - Cameroon Montane Forests and Lakes
- ▶ Asia:
 - Lower Mekong Forests
 - Eastern Himalayan Broadleaf and Conifer Forests
 - Sulu-Sulawesi Sea
 - Sichuan-Yunan Temperate Forest
 - Tibetan Plateau Steppe
- ▶ Europe:
 - Mediterranean Shrublands and Woodlands
 - Northern Atlantic Shelf (Celtic and Wadden)
 - Barents Sea
 - Carpathians
 - Russian Far East Temperate Forests
- ▶ North America:
 - Bering Sea
 - Klamath-Siskiyou Forests
 - South Florida Ecosystem
 - Southeast Rivers and Streams Complex

2 Pan-European Ecological Network

GENERAL INFORMATION ON THE NETWORK

Location of the Network

Pan-Europe: 52 countries in Europe and northern Asia.

Responsible Organisations

United Nations Environment Programme, Council of Europe.

Main Objectives of the Network

Ensuring that a full range of ecosystems, habitats, species and their genetic diversity, and landscapes of European importance are conserved; habitats are large enough to place species in a favourable conservation status; there are sufficient opportunities for the dispersal and migration of species; damaged elements of the key systems are restored and the systems are buffered from potential threats.

Main Components of the Network

- ▶ Core areas.
- ▶ Corridors.
- ▶ Buffer zones.
- ▶ Restoration areas.

Ecosystems Included in the Network

Characteristic ecosystems of European importance, including natural and semi-natural habitats and natural and cultural landscapes of European importance.

Species Protected Through the Network

Species of European importance (not yet specified, but to an important extent the species already listed under existing international agreements such as the EU Birds and Habitats Directives and the Bern and Bonn Conventions).

Natural Resources Exploited Within the Network

Not yet determined.

Relevant Government Policy

The development of the network will make use of the various international agreements, the most important of which are:

- ▶ Pan-European Biological and Landscape Diversity Strategy (Sofia, 1995, of which it is a part).
- ▶ Convention on Wetlands of International Importance (Ramsar, 1971).
- ▶ Convention of the Conservation of Migratory Species of Wild Animals (Bonn, 1979), including the separate agreements.
- ▶ Convention on Biological Diversity (Rio de Janeiro, 1992).
- ▶ Convention on the Conservation of European Wildlife and Natural Habitats (including the Emerald Network, Bern, 1979).
- ▶ Convention for the Protection of the Mediterranean Sea Against Pollution (Barcelona, 1976, including the Protocol concerning Specially Protected Areas in the Mediterranean, Geneva, 1982; the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean, Barcelona, 1995; and the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean, Barcelona, 1995).

- ▶ Alpine Convention (Salzburg, 1991, including the protocols, 1994).
- ▶ EU Directive on the Conservation of Wild Birds (Birds Directive, 79/409/EEC, 1979, as amended by EU Directives 91/224/EEC and 94/24/EEC).
- ▶ EU Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive, 92/43/EEC, 1992).
- ▶ Man and Biosphere Programme (UNESCO, 1971).
- ▶ European Diploma of Protected Areas (Council of Europe, 1965).
- ▶ European Network of Biogenetic Reserves (Council of Europe, 1976).

Status of Network Plan

International agreement (part of the Pan-European Biological and Landscape Diversity Strategy, endorsed by the 54 member states of the United Nations Economic Commission for Europe in Sofia, 1995). The implementation of the network is the responsibility of the countries which are party to the Pan-European Ecological Network. Implementation is scheduled for completion in 2005.

3 Bonn Convention: Memorandum of Understanding Concerning Conservation Measures for the Slender-Billed Curlew

GENERAL INFORMATION ON THE NETWORK

Location of the Network

The potential breeding, migration and wintering area of the slender-billed curlew in Albania, Algeria, Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Egypt, the EU, Georgia, Greece, Hungary, Iran, Iraq, Italy, Kazakhstan, Malta, Morocco, Oman, Romania, Russian Federation, Spain, Tunisia, Turkey, Turkmenistan, Ukraine, United Arab Emirates, Uzbekistan, Yemen and Yugoslavia.

Responsible Organisation

Convention on the Conservation of Migratory Species of Wild Animals, Bonn, Federal Republic of Germany.

Main Objectives of the Network

To improve the conservation status of the slender-billed curlew throughout its potential breeding, migrating and wintering range, by means of the close cooperation of the range states.

Main Components of the Network

- ▶ Core areas.
- ▶ Corridors.

Ecosystems Included in the Network

The habitat of the slender-billed curlew.

Species Protected Through the Network

Slender-billed curlew (*Numenius tenuirostris*).

Natural Resources Exploited Within the Network

Not specified.

Relevant Government Policy

The range states are obliged to:

- ▶ Provide strict protection for the slender-billed curlew and identify and conserve the wetlands and other habitats essential for its survival.
- ▶ Implement in their respective countries the Action Plan annexed to the Memorandum.
- ▶ Develop a longer-term Action Plan in cooperation with the Secretariat for possible inclusion in the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA).
- ▶ Impose a ban on hunting of similar looking wader species and initiate educational programmes for hunters to enable them to distinguish between different species.
- ▶ At appropriate times, deny hunters access to sites frequented by slender-billed curlews.
- ▶ Intensify research and facilitate the collection of scientific, technical and legal information required by appropriate authorities and experts for effective coordinated conservation measures.

Status of Network Plan

A Memorandum of Understanding under Article IV, paragraph 4 of the Convention, was adopted in July 1994 and signed by 17 range states (1997). The range states are to provide the secretariat with a report on the implementation of the Memorandum at least annually following its signature. The secretariat is to transmit to each of the range states all of the reports received, together with a general report which it shall compile on the basis of the information at its disposal. The secretariat has encouraged the initiation of conservation projects for the slender-billed curlew in several range states and is maintaining close contact with various organisations, scientific institutions and national authorities already engaged in such activities.

4 Bonn Convention: Memorandum of Understanding Concerning Conservation Measures for the Siberian Crane

GENERAL INFORMATION ON THE NETWORK**Location of the Network**

The range states of the western and central Asian populations of the Siberian Crane, that is India, Iran, Kazakhstan, Pakistan, the Russian Federation, Turkmenistan and Uzbekistan.

Responsible Organisation

Convention on the Conservation of Migratory Species of Wild Animals, Bonn, Federal Republic of Germany.

Main Objectives of the Network

To ensure the survival of the West and Central Asian populations of the Siberian Crane throughout its potential breeding, migrating and wintering range, by means of the close cooperation of the range states.

Main Components of the Network

- ▶ Core areas.
- ▶ Corridors.

Ecosystems Included in the Network

The habitat of the Siberian crane.

Species Protected Through the Network

Siberian crane (*Grus leucogeranus*).

Natural Resources Exploited Within the Network

Not specified.

Relevant Government Policy

The range states are obliged to:

- ▶ Provide strict protection for the Siberian crane and identify and conserve the wetlands and other habitats essential for its survival, if necessary through enacting and enforcing legislation.
- ▶ Implement in their respective countries the Action Plan which is annexed to the Memorandum.
- ▶ Develop a longer-term Action Plan in cooperation with the secretariat of the Convention for possible inclusion in the Agreement on the Conservation of Asian/Australian Waterfowl being developed under the auspices of the Bonn Convention.
- ▶ Protect traditional breeding, staging and wintering areas and identify key sites.
- ▶ Prepare national action plans.
- ▶ Prepare detailed proposals for monitoring, research and practical measures to restore populations.
- ▶ Develop proposals for a funding mechanism for conservation measures.
- ▶ Raise awareness through education programmes among people living in areas frequented by Siberian cranes of the urgency of conserving them.
- ▶ Cooperate in the development of a concerted international mass media campaign, focusing primarily on the range states.

Status of Network Plan

A Memorandum of Understanding under Article IV, paragraph 4 of the Convention was adopted in June 1993 and has been signed and ratified by seven of the nine range states, namely India, Iran, Kazakhstan, Pakistan, the Russian Federation, Turkmenistan and Uzbekistan. A detailed Conservation Plan was one of the outputs of the meeting of national representatives and experts held in India in 1996, setting out three basic objectives:

- ▶ The reduction of mortality rates in remaining populations.
- ▶ An increase in numbers and genetic diversity.
- ▶ Enhanced cooperation among the range states and agencies.

Implementation of the Memorandum and the Action Plan are to be assessed at annual meetings convened by the Convention's secretariat and attended by representatives of the governments of the range states and technically qualified agencies and experts.

5 Bonn Convention: Agreement on the Conservation of African-Eurasian Migratory Waterbirds

GENERAL INFORMATION ON THE NETWORK

Location of the Network

117 range states. The Agreement covers waterbirds ecologically dependent on wetlands in Africa and Eurasia, including the Middle East, Greenland and parts of Canada.

Responsible Organisation

Convention on the Conservation of Migratory Species of Wild Animals, Bonn, Federal Republic of Germany.

Main Objectives of the Network

To maintain in, or to restore to, a favourable conservation status 170 species of migratory waterbirds.

Main Components of the Network

- ▶ Core areas.
- ▶ Corridors.

Ecosystems Included in the Network

The habitats of the 170 species.

Species Protected Through the Network

The 170 species include divers, grebes, pelicans, egrets, herons, storks, ibises, spoonbills, flamingos, ducks, geese, cranes, plovers, sandpipers, gulls and terns.

Natural Resources Exploited Within the Network

Not specified.

Relevant Government Policy

The range states are obliged to:

- ▶ Prohibit the taking of endangered waterbird species (including their eggs), protect and where possible restore their habitat, eliminate, prevent or minimise impediments to their migration and prevent, reduce or control factors endangering them.
- ▶ Ensure that the use of waterbirds is sustainable both in terms of the species and the ecosystem that supports them.
- ▶ Identify sites and habitats for migratory waterbirds within their territory and encourage the protection, management, rehabilitation and restoration of these sites.
- ▶ Coordinate their efforts to ensure that a network of suitable habitats is maintained, and in particular where wetlands extend over the area of more than one party to the Agreement.

Status of Network Plan

An agreement under Article IV (3) of the Convention adopted in June 1995. 53 states and the EU were signatories to the Final Act. The Agreement has been signed by 32 states and the EU and ratified by 24 states. The Agreement Action Plan identifies the following actions:

- ▶ The establishment of protected areas to conserve important habitats for the populations listed in the Agreement's Action Plan and the development and implementation of management plans.

- ▶ The development of strategies, following an ecosystem-based approach, for the conservation of those habitats, including the habitats of dispersed populations.

6 Bonn Convention: Agreement on the Conservation of Bats in Europe

GENERAL INFORMATION ON THE NETWORK

Location of the Network

The territory of the 20 parties to the Convention (Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Luxembourg, Macedonia, Monaco, Netherlands, Norway, Poland, Portugal, Slovakia, Sweden, Ukraine, United Kingdom).

Responsible Organisation

Convention on the Conservation of Migratory Species of Wild Animals, Bonn, Federal Republic of Germany.

Main Objectives of the Network

To achieve and maintain a favourable conservation status of bat populations in European and non-European range states and to counteract the threat posed to these species from habitat degradation, disturbance to roosting sites and certain pesticides.

Main Components of the Network

- ▶ Core areas.
- ▶ Corridors.

Ecosystems Included in the Network

The habitats of the listed species.

Species Protected Through the Network

European populations of Microchiroptera (Molossidae, Rhinolophidae and Vespertilionidae).

Natural Resources Exploited Within the Network

Not specified.

Relevant Government Policy

Each party is obliged to:

- ▶ Prohibit the deliberate capture, keeping or killing of bats (spp Rhinolophidae and Vespertilionidae) except with a permit from a competent authority.
- ▶ Identify the sites within its own area of jurisdiction that are important for the conservation of bats, protect such sites from damage or disturbance and identify and similarly protect important feeding areas for bats.
- ▶ Adopt and enforce such legislative and administrative measures as may be necessary to give effect to the Agreement.

Status of Network Plan

An agreement under Article IV(3) of the Convention, adopted in September 1991 and signed by 20 parties.

7 Bonn Convention: Agreement on the Conservation of Cetaceans of the Black Sea, the Mediterranean Sea and the Contiguous Atlantic Area (ACCOBAMS)

GENERAL INFORMATION ON THE NETWORK

Location of the Network

The Black Sea, the Mediterranean Sea and the contiguous area of the Atlantic Ocean west of the Straits of Gibraltar.

Responsible Organisation

Convention on the Conservation of Migratory Species of Wild Animals, Bonn, Federal Republic of Germany.

Main Objectives of the Network

To achieve and maintain a favourable conservation status for those species of cetaceans listed in Annex I of the Agreement.

Main Components of the Network

Marine areas.

Ecosystems Included in the Network

Marine ecosystems of the Black Sea, the Mediterranean Sea and the contiguous area of the Atlantic Ocean.

Species Protected Through the Network

Cetacean species of the Black Sea, the Mediterranean Sea and the contiguous area of the Atlantic Ocean, the most important being:

- | | |
|---------------------------|---------------------------|
| ▶ Harbour porpoise | <i>Phocoena phocoena</i> |
| ▶ Bottlenose dolphin | <i>Tursiops truncatus</i> |
| ▶ Common dolphin | <i>Delphinus delphis</i> |
| ▶ Long-finned pilot whale | <i>Globicephala melas</i> |

Natural Resources Exploited Within the Network

Not specified.

Relevant Government Policy

The parties to the Agreement are required to:

- ▶ Prohibit any deliberate taking of cetaceans (with a few clearly defined exceptions).
 - ▶ Create and maintain a network of specially protected areas to conserve cetaceans.
- Annex I consists of a list of indicative species to which the Agreement applies. It also applies to any other cetaceans not listed in the Annex, but which may frequent the Agreement area accidentally or occasionally. Annex II (the Conservation Plan) specifies actions which parties shall take in the following areas:
- ▶ Adoption and enforcement of national legislation.
 - ▶ Assessment and management of human-cetacean interactions.
 - ▶ Habitat protection.
 - ▶ Research and monitoring.
 - ▶ Capacity-building.
 - ▶ Collection of information.
 - ▶ Training and education.
 - ▶ Responses to emergencies.

In implementing the measures, the parties shall apply the precautionary principle. In implementing the Plan, the parties are required to carry out the actions to the maximum extent of their economic, technical and scientific capacities. Regarding habitat protection, specially protected areas for cetaceans corresponding to the areas which serve as habitat and/or which provide important food resources for them should be established within the framework of the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean or within the framework of other appropriate instruments.

Status of Network Plan

An agreement under Article IV of the Bonn Convention, adopted in November 1996 and signed by 15 parties (including the EU) but not yet in force.

8 Bonn Convention: Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS)

GENERAL INFORMATION ON THE NETWORK

Location of the Network

The Baltic and North Sea marine area of the parties to the Agreement: Belgium, Denmark, Finland, Germany, Netherlands, Poland, Sweden, United Kingdom.

Responsible Organisation

Convention on the Conservation of Migratory Species of Wild Animals, Bonn, Federal Republic of Germany.

Main Objectives of the Network

To achieve and maintain a favourable conservation status for the small cetaceans species covered by the Agreement.

Main Components of the Network

Marine areas.

Ecosystems Included in the Network

Marine ecosystems of the Baltic and North Seas.

Species Protected Through the Network

The whale and dolphin species that enter the North and Baltic Seas, with the exception of baleen and great sperm whales. The most important species are:

- | | |
|--|-----------------------------------|
| ▶ Harbour porpoise | <i>Phocoena phocoena</i> |
| ▶ Bottlenose dolphin | <i>Tursiops truncatus</i> |
| ▶ White-beaked dolphin | <i>Lagenorhynchus albirostris</i> |
| ▶ Atlantic white-sided dolphin | <i>Lagenorhynchus acutus</i> |
| ▶ Common dolphin | <i>Delphinus delphis</i> |
| ▶ Striped dolphin | <i>Stenella coeruleoalba</i> |
| ▶ Risso's dolphin | <i>Grampus griseus</i> |
| ▶ Killer whale | <i>Orcinus orca</i> |
| ▶ Long-finned pilot whale | <i>Globicephala melas</i> |
| ▶ Northern bottlenose whale and other beaked whales (<i>Ziphiidae</i>) | <i>Hyperoodon ampullatus</i> |

Natural Resources Exploited Within the Network

Not specified.

Relevant Government Policy

Each Party shall apply within the limits of its jurisdiction and in accordance with its international obligations, the conservation, research and management measures prescribed in the Annex, namely:

- ▶ Habitat conservation and management.
- ▶ Surveys and research.
- ▶ Use of by-catches and strandings.
- ▶ Legislation.
- ▶ Information and education.

Status of Network Plan

An agreement under Article IV (3) of the Bonn Convention, adopted in March 1992 and to which 8 countries are party.

9 Bonn Convention: Agreement on the Conservation of Seals in the Wadden Sea

GENERAL INFORMATION ON THE NETWORK**Location of the Network**

The area of the Wadden Sea, including all sandbanks, the shore of the North Sea coast of Denmark, Germany and the Netherlands and the adjacent off-shore area within the three-nautical-mile zone.

Responsible Organisation

Convention on the Conservation of Migratory Species of Wild Animals, Bonn, Federal Republic of Germany.

Main Objectives of the Network

To achieve and maintain a favourable conservation status for the population of seals in the Wadden Sea.

Main Components of the Network

Marine areas.

Ecosystems Included in the Network

The Wadden Sea marine ecosystem.

Species Protected Through the Network

Harbour/common seal *Phoca vitulina*

Natural Resources Exploited Within the Network

Not specified.

Relevant Government Policy

On the basis of scientific knowledge, the parties are required to develop a conservation and management plan for the seal population. This plan is to contain a comprehen-

sive statement of actions to be undertaken by the parties to achieve the goals of the Agreement. The parties shall review the plan and amend it as necessary, and particularly as a result of scientific research and shall coordinate their research programmes and projects and the monitoring of the seal populations. They are also required to prohibit the taking of seals from the Wadden Sea. The parties shall pay due regard to the necessity of creating and maintaining a network of protected areas, including migration areas and those areas essential to the maintenance of the seals' vital biological functions. They shall protect habitats and the seals from undue disturbance and changes resulting from human activities and are encouraged to explore the possibility of restoring degraded habitats and creating new ones.

Status of Network Plan

An agreement under Article IV of the Bonn Convention, adopted in October 1990 and with 3 parties: Denmark, Germany and the Netherlands.

10 Western Hemisphere Shorebird Reserve Network

GENERAL INFORMATION ON THE NETWORK

Location of the Network

North and South America.

Responsible Organisation

Manomet Center for Conservation Sciences, Manomet, Massachusetts, USA.

Main Objectives of the Network

The conservation of critical shorebird habitats throughout the Americas.

Main Components of the Network

- ▶ Core areas (40 critical sites).
- ▶ Corridors.

Ecosystems Included in the Network

Shorebird habitats.

Species Protected Through the Network

47 species of migratory shorebirds, including:

- ▶ Sandpipers
- ▶ Plovers
- ▶ Avocets
- ▶ Oystercatchers

Natural Resources Exploited Within the Network

Not specified.

Relevant Government Policy

40 sites are officially designated in Argentina, Brazil, Peru, Suriname, Mexico, USA and Canada.

Status of Network Plan

Voluntary, non-regulatory coalition of over 140 private and public organisations in 7 countries, established in 1985.

Dimensions of the Network

Area: 4.5 million ha (40 core areas).

11 Ecological Corridor of the Americas (EcoAméricas)

GENERAL INFORMATION ON THE NETWORK

Location of the Network

The territory of North and South America.

Responsible Organisation

Wildlife Conservation Society, Gainesville, Florida, USA.

Main Objectives of the Network

To contribute to the social, economic, cultural and scientific development of the western hemisphere through the conservation and restoration of biological diversity along the mountain backbone of the Americas.

Main Components of the Network

- ▶ Core areas.
- ▶ Corridors.
- ▶ Buffer zones (multiple resource-use lands).
- ▶ Restoration areas.

Ecosystems Included in the Network

Mainly mountain ecosystems with multiple links to Pacific and Atlantic lowland ecosystems.

Species Protected Through the Network

Not specified, but aim is to ensure protection of 50% of the total biodiversity of the two continents.

Natural Resources Exploited Within the Network

Not specified.

Relevant Government Policy

Existing protected area policies in the countries along the corridor.

Status of Network Plan

Independent initiative of the Wildlife Conservation Society. The draft proposal was circulated in February 2000.

Dimensions of the Network

North-south: Approx. 40,000 km.

12 Mesoamerican Biological Corridor/ Paseo Pantera

43

GENERAL INFORMATION ON THE NETWORK

Location of the Network

The territory of Central America, extending into Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua and Panama.

Responsible Organisations

Central American Council for Forests and Protected Areas, Tegucigalpa, Honduras; Wildlife Conservation Society, Gainesville, Florida, USA; Caribbean Conservation Corporation, Gainesville, Florida, USA; University of Florida, Gainesville, Florida, USA.

Main Objectives of the Network

To avoid the deterioration and loss of biodiversity through conservation of representative samples of the region's environments, preventing the fragmentation of ecosystems with the conformation of a set of interconnected areas that will permit the possibility of genetic and biological interchange between fragmented populations, the continuity of biological processes and the integration of these areas within a regional planning process that is oriented towards sustainable development.

Main Components of the Network

- ▶ Core areas.
- ▶ Corridors.
- ▶ Buffer zones (multiple use areas).

Ecosystems Included in the Network

- ▶ Moist lowland rain forests of the Atlantic slope.
- ▶ Pacific slope dry forests.
- ▶ Marine habitats.
- ▶ Highland pine-oak forests.

Species Protected Through the Network

Not specified.

Natural Resource Exploitation Within the Network

Timber, agriculture, coastal fishing, ecotourism.

Relevant Government Policy

The Convention on Biological Diversity and the Protection of Priority Natural Areas, 1992 provided a regional framework for developing cooperation to establish the corridor. The conceptual framework for the corridor was approved by the governments of the participating countries in 1997 through the Central American Alliance for Sustainable Development, which has as one of its key commitments the establishment of the corridor. Also relevant is the Regional System of Protected Areas, developed by United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP) in cooperation with the Central American Council for Environment and Development.

Status of Network Plan

In 1997 the governments of the participating countries defined the corridor as

'a territorially organised system composed of natural areas under special administrative regimes, core areas, buffer zones, areas of multiple use and interconnection, organised and consolidated to offer a variety of environmental products and services to the Central American and global societies, allowing for social harmonisation to promote investment in the sustainable use of natural resources, with the aim of contributing towards improving the life of the inhabitants of the region'. 16 regional projects to help establish the corridor are underway. In 1997 the World Bank approved a project to improve institutional capacity and participatory protection for protected areas, to improve natural resource management and to strengthen the national biological monitoring capacity. NASA and the Central American Commission for Environment and Development have initiated a joint project to strengthen scientific research, data exchange and training, including mapping of the region through remote sensing. A joint UNEP and UNDP project to support the implementation of the corridor was launched in April 2000.

Dimensions of the Network

North-south: Approx. 2400 km.

13 East Asian-Australasian Shorebird Site Network

GENERAL INFORMATION ON THE NETWORK

Location of the Network

Russian Federation, Republic of Korea, Japan, People's Republic of China, Philippines, Indonesia, Papua New Guinea, Australia, New Zealand. The boundaries for the network are primarily defined on an ecological basis, determined by the pattern of migration of the species involved. The western, northern and eastern margins overlap with adjacent flyways. Some consideration has been given to regional geo-political considerations in deciding how to define national involvement on the eastern margin of the flyway. Coordinates:

- ▶ Moroshechnaya Estuary, Russian Federation, 56 21 156 15
- ▶ Tonggin River Lagoon and mudflat, Republic of Korea, 35 37 126 31
- ▶ Yatsu tidal flats, Japan, 35 41 140 00
- ▶ Yoshino Estuary, Japan, 34 05 134 36
- ▶ Manko, Japan, 26 10 127 40
- ▶ Yalu Jiang Nature Reserve, China, 39 40 123 50
- ▶ Shuangtaihekou National Nature Reserve, China, 40 57 121 45
- ▶ Huanghe National Nature Reserve, China, 37 50 118 50
- ▶ Yancheng Biosphere Reserve, China, 33 20 120 30
- ▶ Chongming Dongtan, China, 31 30 121 45
- ▶ Mai Po–Inner Deep Bay, China, 22 30 114 00
- ▶ Olango Island, Philippines, 10 16 124 03
- ▶ Wasur Game Reserve, Indonesia, 8 35 140 45
- ▶ Tonda Wildlife Reserve, Papua New Guinea, 8 45 141 23
- ▶ Kakadu National Park, Australia, 12 40 132 45
- ▶ Parry Lagoons, Australia, 15 15 128 22
- ▶ Thomsons Lake, Australia, 32 09 115 52
- ▶ Moreton Bay, Australia, 27 20 153 10
- ▶ Kooragang Nature Reserve, Australia, 32 51 151 47

- ▶ Corner Inlet, Australia, 38 45 146 32
- ▶ The Coorong, Australia, 35 40 139 00
- ▶ Orielton Lagoon, Australia, 42 47 147 30
- ▶ Logan Lagoon, Australia, 40 10 148 17
- ▶ Firth of Thames, New Zealand, 37 13 175 23
- ▶ Farewell Spit, New Zealand, 40 32 172 50.

Responsible Organisation

Wetlands International–Oceania, Canberra, Australia.

Main Objectives of the Network

To ensure the long term conservation of migratory shorebirds in the East Asian-Australasian Flyway through recognition and appropriate management of a network of internationally important sites.

Main Components of the Network

The Network now has 25 sites in nine countries. The management status of these sites is as follows:

- ▶ Category Ia: 9 sites
- ▶ Category Ib: 1 sites
- ▶ Category II: 6 sites
- ▶ Category IV: 3 sites
- ▶ Category VI: 6 sites

A number of these sites have management zones and the core area is much smaller than the area included in the network (especially in China).

Ecosystems Included in the Network

Sites of international importance for migratory shorebirds.

Species Protected Through the Network

- ▶ Migratory shorebirds *Charadriiformes*

Natural Resource Exploitation Within the Network

Fisheries, subsistence hunting and gathering.

Relevant Government Policy

Australian Commonwealth Wetlands Policy.

Status of Network Plan

Action Plan for the Conservation of Migratory Shorebirds in Asia Pacific: 1998–2000 (1999).

Dimensions of the Network

- ▶ Area: 3,138,589 ha.
- ▶ North-south: 14,000 km.
- ▶ East-west: 10,000 km.
- ▶ Altitude range: Approx. 0–100 m.
- ▶ Longest distance between core areas: 3,000 km.
- ▶ Shortest distance between core areas: Adjacent across international border.
- ▶ Areal percentage of core areas in relation to entire network: Greater than 50%.

ENVIRONMENTAL CHARACTERISTICS

Main Environmental Units

- ▶ Climatic zones: Tropical, rainy climate; dry climate; warm, temperate, rainy climate; cool, snow-forest climate; polar climate.
- ▶ Phyto-geographical/vegetation zones: The geographic coverage of the Network includes all vegetation types, although most sites in the Network are tidal flats.
- ▶ River basins/marine areas: Many.

Main Ecosystems Within the Network

- ▶ Inland waters and wetlands: 10%.
- ▶ Coastal ecosystems: 90%.

Main Environmental Functions of the Network

- ▶ Maintaining or increasing the area of certain habitats.
- ▶ Maintaining or improving the dispersal, migration and/or genetic exchange of certain species.
- ▶ Restoring habitat quality.

NATURAL RESOURCE EXPLOITATION

Main Types of Land and Water Use

| Type of Land or Water Use | System or Sector | Main Products or Services | Extent (% area of network/length) | No. of Persons Directly Involved |
|--------------------------------|---|--|--|---|
| ▶ Arable farming/ horticulture | Small-scale intensive cropping | Rice, wheat | 10–25% | 10,000's |
| ▶ Animal husbandry/ rangelands | Traditional, extensive, sedentary | Sheep, goats, buffalo | <10% | 1000's |
| ▶ Production forestry | Plantation forests | – | <10% | 100's |
| ▶ Fisheries | Artisanal, small-scale, inland; artisanal, small-scale, coastal; fish-farming | Shellfish, prawns, ell fry | – | 10,000's |
| ▶ Industry/energy production | Energy production | Oil, renewable energy | – | 1000's |
| ▶ Recreation/tourism | Tourism | Ecotourism/ nature observation, recreational hunting/fishing, cultural experiences | – | 100's |
| ▶ Habitation | – | – | – | 1000's in core areas, 100,000's in buffer zones |
| ▶ Infrastructure | – | – | Roads 1000's km, railways 10's km, canals 100's km | – |

Proposal/Plan/Programme

- ▶ Type of plan: Regional plan, focused on the East Asian-Australasian Flyway. Part of a larger Asia-Pacific Migratory Waterbird Conservation Strategy, 1996–2000.
- ▶ Reference: Shorebird Working Group of Wetlands International–Asia Pacific (1999) Action Plan for the Conservation of Migratory Shorebirds in Asia Pacific: 1998–2000, Environment Australia, Canberra.
- ▶ Responsible organisation: Coordinated by Wetlands International.
- ▶ Plan comes into effect: 1998.
- ▶ Implementation complete: End 2000.
- ▶ Implementing parties: Implementation is being coordinated by a Shorebird Flyway Officer working for Wetlands International–Oceania. There is an international advisory group that meets once a year to review implementation (Shorebird Working Group) and this reports to a Migratory Waterbird Conservation Committee which is a sub-committee of the Wetlands International–Asia Pacific Council. Core funding for this work is from the Australian Government.
- ▶ Results achieved: End 2000.
- ▶ Plan revised: 1999.
- ▶ Plan evaluated: By Shorebird Working Group.

Data Collected

- ▶ Type of data: Up to individual sites. Has been a program to collect baseline information at sites in developing countries. Participation in the Asian Waterfowl Census is being promoted.
- ▶ Methods: Surveying and mapping.

Monitoring and Evaluation Arrangements

- ▶ Plan monitored/evaluated by: Annual reporting to the Shorebird Working Group and the Australian Government (Environment Australia).
- ▶ Monitoring/evaluation of results: Not yet – the real test is ‘are populations of migratory shorebirds in the Flyway being maintained’. At present there is not sufficient infrastructure and institutional capacity to make these assessment. The Action Plan and development of the Network are seeking to address this need.

Associated Research

- ▶ Develop statistically robust methodologies to monitor shorebird populations and develop projects for implementation in priority countries (Australia, New Zealand and Japan).
- ▶ Develop and implement projects to identify internationally important sites for shorebirds in countries where knowledge is incomplete, notably the Peoples Republic of China, Republic of Korea, Vietnam, The Philippines and Papua New Guinea.
- ▶ Support existing and initiate new projects on shorebird migration with a special focus on the use of colour leg flags and public involvement in resightings. Seek to maximise community involvement in these projects.
- ▶ Compile and publish an overview of the status of shorebirds and internationally important sites in the East Asian-Australasian Flyway. Assess the adequacy of the Shorebird Reserve Network to conserve species.

Educational/Communication Activities

- ▶ Activities carried out: Communication Strategy developed.
- ▶ Aim of activities: The communication activities will promote the following elements of the Shorebird Action Plan: nomination of additional sites for the Shorebird Site Network, gain the involvement of additional countries, site dedication ceremonies, involvement on the implementation and review of the Action Plan, knowledge and participation in training initiatives, involvement in shorebird migration studies, exchange of information on shorebird conservation and habitat management between site managers, researchers and non-government organisations. The main messages to be delivered through this strategy are: shorebird migration, internationally important sites for shorebirds, shorebird Action Plan, shorebird Site Network, joining the Site Network, training opportunities for staff at network sites, management planning, migration research activities, update of the Shorebird Action Plan. Desired outcomes:
 1. A high level of knowledge of the Shorebird Action Plan and Shorebird Site Network by the key staff of international Convention Secretariat's, National Government Agencies, international non-government Organisations and key national non-government organisations.
 2. A high level of awareness of the key sites for shorebirds at the national level by key staff of National Government Agencies and key national non-government organisations.
 3. A high level of knowledge of the nomination process for the Shorebird Site Network by the key staff of National Government Agencies and key national non-government organisations.
 4. Recognition of the value of conducting site dedications by staff at Network Site.
 5. A high level of awareness of training opportunities by staff at Networks Sites.
 6. A high level of awareness of the diversity of site management planning by key staff at Network sites.
 7. A high level of awareness of migration research activities by National Government Agencies, international non-government Organisations and key national non-government organisations.
 8. A high level of knowledge of the update of the Shorebird Action Plan for 2001 - 2005 by the key staff of international Convention Secretariat's, National Government Agencies, international non-government Organisations and key national non-government organisations.
- ▶ Activities directed at: To achieve the identified outcomes five specific and one general audience have been identified:
 1. Key staff in international Convention Secretariat's (Ramsar, Bonn, CAFF).
 2. Key staff in national Government Agencies in the East Asian-Australasian Flyway.
 3. Key staff in international non-government organisations active in shorebird/wetland conservation in the East Asian-Australasian Flyway.
 4. Key national non-government organisations in the East Asian-Australasian Flyway.
 5. Staff at Shorebird Network Sites.
 6. General public.

Legal Status of Network

- ▶ Status: Voluntary cooperative initiative.

Budget and Resources

- ▶ Funding: Approximately US\$1 million has been raised for implementation of the plan. Most of this funding is from the Australian Government. Funding for site management is not included in this figure.
- ▶ Available resources: Staff supporting the implementation of the plan/development of the Network = 1 person; staff involved in management of sites in the Network = approx. 100.
- ▶ Increase in funding for biodiversity conservation stimulated by network: About US\$1 million.

Relation to Other Networks

- ▶ Other known networks: Migratory waterbird networks, MAB programme.
- ▶ Benefits gained from other networks: The network in this flyway has been modelled on the Western Hemisphere Shorebird Reserve Network.

Further Information

- ▶ Related initiatives: Asia-Pacific Migratory Waterbird Conservation Strategy 1999–2000.
- ▶ Complementary activities: The development of a multilateral legal framework would assist in getting national government funding for migratory waterbird conservation.

14 Natura 2000

GENERAL INFORMATION ON THE NETWORK

Location of the Network

The European territory and coastal waters of the 15 EU member states.

Responsible Organisation

European Commission.

Main Objectives of the Network

To maintain at or restore to a favourable conservation status natural habitats and species of wild fauna and flora of Community interest.

Main Components of the Network

- ▶ Core areas.
- ▶ Corridors (optional).

Ecosystems Included in the Network

The habitat types of Community interest and the habitats of species of Community interest listed in the 4 annexes to the EU Habitats Directive (92/43/EEC, supplemented in 1997 by Decision 97/266/EC and amended in 1997 by Directive 97/62/EC), of which there are 253 habitat types, and the habitats of the bird species listed in Annex I to the EU Birds Directive (79/409/EEC, amended in 1981 by Directive 81/854/EEC, in 1985 by Directive 85/411/EEC, in 1986 by Directive 86/122/EEC, in 1991 by Directive 91/244/EEC, in 1994 by Directive 94/24/EC and in 1997 by Directive 97/49/EC).

Species Protected Through the Network

- ▶ 175 bird species:
 - Species in danger of extinction.
 - Species vulnerable to specific changes in their habitat.
 - Species considered rare because of small populations or restricted local distribution.
 - Other species requiring particular attention for reasons of the specific nature of their habitat.
- ▶ 200 animal species and 434 plant species:
 - Animal and plant species of Community interest and whose conservation requires the designation of Special Areas of Conservation (SACs).
 - Animal and plant species of Community interest and in need of strict protection.
 - Animal and plant species of Community interest and whose taking in the wild and exploitation may be subject to management measures.

Natural Resources Exploited Within the Network

Not specified.

Relevant Government Policy

The Habitats Directive requires the EU member states to identify, designate and conserve areas that are necessary to maintain or restore habitats and species of Community interest at a favourable conservation status. Each member state shall contribute to the creation of Natura 2000 in proportion to the representation within its territory of the natural habitat types and the habitats of species. For these areas member states shall establish the necessary conservation measures. The process of selecting sites begins with the submission of lists of potential sites by member states to the Commission, with a deadline of June 1995. It proceeds to the adoption by June 1998 of a list of Sites of Community Importance (SCIs) by biogeographical region and is completed with the designation of SCIs as SACs in individual member states by 2004. Member states shall bring into force the laws, regulations and administrative provisions necessary to comply with the Directive within two years of its notification (that is, by 5 June 1994).

Status of Network Plan

The establishment of Natura 2000 – ‘a coherent European ecological network’ – is a legally binding obligation under the Birds and Habitats Directives and will comprise the SACs designated under the Habitats Directive and the Special Protection Areas designated under the Birds Directive. In addition to proposals by member states for the designation of SACs, there is also a procedure to allow the ‘designation in exceptional cases of a site which has not been proposed by a Member State but which the Community considers essential for either the maintenance or the survival of a priority habitat type or a priority species’.

15 European Coastal and Marine Ecological Network

51

GENERAL INFORMATION ON THE NETWORK

Location of the Network

Coastal and marine areas in Europe.

Responsible Organisation

European Union for Coastal Conservation.

Main Objectives of the Network

- ▶ Raise awareness of the importance of ecological networks to the conservation of habitats and species at a pan-European level and thereby encourage their development.
- ▶ Identify gaps in the current approaches to site and species conservation.
- ▶ Provide the necessary scientific information to inform the process of network development.
- ▶ Provide support for local and national initiatives in network building.

Main Components of the Network

Not specified.

Ecosystems Included in the Network

Coastal typology:

- ▶ Hard rock cliffed coasts.
- ▶ Hard rock coastal plains.
- ▶ Soft rock cliffed coasts.
- ▶ Tide-dominated sediment plains.
- ▶ Wave-dominated sediment plains.

Species Protected Through the Network

Illustrative species studied in the first phase:

- | | |
|---------------------------|-----------------------------------|
| ▶ Minke whale | <i>Balaenoptera acutorostrata</i> |
| ▶ Atlantic salmon | <i>Salmo salar</i> |
| ▶ Mediterranean monk seal | <i>Monachus monachus</i> |
| ▶ Knot | <i>Calidris canutus islandica</i> |

Illustrative species studied in the second phase:

- | | |
|---------------------|---------------------------|
| ▶ Loggerhead turtle | <i>Caretta caretta</i> |
| ▶ Grey seal | <i>Halichoerus grypus</i> |
| ▶ Puffin | <i>Fratercula arctica</i> |
| ▶ Common scoter | <i>Melanitta nigra</i> |
| ▶ Barnacle goose | <i>Branta leucopsis</i> |
| ▶ Eleonora's falcon | <i>Falco eleonorae</i> |

Natural Resources Exploited Within the Network

Not specified.

Relevant Government Policy

The development of the network is to be based on existing policies, such as:

- ▶ Protected areas, such as the sites making up Natura 2000.
- ▶ Regional management units, such as the Wadden Sea, the Oder delta and the Dnjestr delta.

- ▶ Coastal zone management plans for individual estuaries, deltas, open coasts and catchment areas.
- ▶ National biodiversity strategies.
- ▶ Regional seas programmes, such as Helcom.

Status of Network Plan

Independent initiative. The European Coastal and Marine Ecological Network (ECMEN) was conceived and launched in 1991 at the European Coastal Conservation Conference in Scheveningen. ECMEN was subsequently included in the Pan-European Biological and Landscape Diversity Strategy as an element of the Pan-European Ecological Network. Phase I of the three-phase programme for ECMEN comprised an Ecological Assessment Study Report that is to lead to the development of guidelines and criteria for the establishment of ECMEN. The report reviewed the parameters for establishing the network, and specifically the identification of the main coastal landscape types based on geomorphological criteria. Four illustrative species were also used as illustrations of how ECMEN might be developed. Phase II of the study aims to extend the analysis of the species habitat requirements from Phase I, to identify and elaborate an additional series of species that are representative of different types of network, to consider the importance of landscape components in networks for conserving widely dispersed and common species and to propose a mechanism for developing ECMEN.

16 Carpathian Ecoregion Initiative

GENERAL INFORMATION ON THE NETWORK

Location of the Network

The Carpathian mountain range, extending into 6 countries: the Czech Republic, Hungary, Poland, Romania, Slovakia and the Ukraine.

Responsible Organisation

WWF Danube-Carpathian Programme.

Main Objectives of the Network

To initiate and facilitate a process through which the key stakeholders collaborate to secure biodiversity conservation and sustainable development in the Carpathians.

Main Components of the Network

- ▶ Core areas.
- ▶ Corridors.
- ▶ Restoration areas.

Ecosystems Included in the Network

Southern European montane forests, including approx. 300 plant communities.

Species Protected Through the Network

Current attention is being paid to keystone species, species of special concern and focal species (area-sensitive species and seasonal migrants). These include:

- ▶ Large carnivores:
 - Brown bear *Ursus arctos*
 - Wolf *Canis lupus*
 - Lynx *Lynx lynx*
 - Wild cat *Felis silvestris*
- ▶ Approx. 200 endemic plant species
- ▶ Over 100 endemic animal species

Natural Resource Exploitation Within the Network

Agriculture, forestry, hunting, mining, tourism.

Relevant Government Policy

- ▶ Pan-European Biological and Landscape Diversity Strategy.
- ▶ Environmental Programme for Europe.
- ▶ EU Birds, Habitats and Environmental Impact Directives for the EU accession countries (all Carpathian countries except the Ukraine).
- ▶ National protected area policy and legislation.
- ▶ Financial assistance programmes of the EU and international financial institutions.

Status of Network Plan

Independent initiative. To be implemented in cooperation with all key stakeholders in the region. Reconnaissance phase completed March 2000. Preparation of biodiversity vision is due to be completed in 2001.

Dimensions of the Network

- ▶ Area: 200,000 sq. km (total area of Carpathians).
- ▶ Altitude range: Max. 2665 m.

17 Transnational Ecological Network (TEN)

GENERAL INFORMATION ON THE NETWORK

Location of the Network

South Jutland (Denmark); Schleswig-Holstein, Niedersachsen, Bremen (Germany); Friesland, Groningen, Overijssel, Drenthe (Netherlands); Norfolk, Suffolk (United Kingdom). The network boundaries coincide with ecological boundaries (of the wetlands and waters).

Responsible Organisation

Friesian Provincial Council, Leeuwarden, the Netherlands.

Main Objectives of the Network

Re-establishment of an ecological network of wetlands and waters by solving cross-border fragmentation problems.

Main Components of the Network

Corridors between wetlands, ranging from strict nature reserves (Category Ia) to multifunctional watersystems (Category VI).

Ecosystems Included in the Network

Wetland and aquatic ecosystems.

Species Protected Through the Network

- ▶ Otter (as flagship species) *Lutra lutra*

Natural Resources Exploited Within the Network

Water, grassland.

Relevant Government Policy

The project is cofinanced by governments involved.

Status of Network Plan

GIS map, completed end 1999.

Dimensions of the Network

- ▶ North-south: 600 km.
- ▶ East-west: 600 km.
- ▶ Longest distance between core areas: 200 km.
- ▶ Shortest distance between core areas: 10 km.
- ▶ Areal percentage of core areas in relation to entire network: Less than 25%.

ENVIRONMENTAL CHARACTERISTICS**Main Environmental Units**

- ▶ Climatic zones: Warm, temperate, rainy climate.
- ▶ Phyto-geographical/vegetation zones: Deciduous forests of temperate latitudes.
- ▶ River basins/marine areas: Around the North Sea.

Main Ecosystems Within the Network

- ▶ Grasslands (area relation not yet known).
- ▶ Inland waters and wetlands (area relation not yet known).

Main Environmental Functions of the Network

- ▶ Maintaining or increasing the area of certain habitats.
- ▶ Maintaining or improving the dispersal, migration and/or genetic exchange of the otter.
- ▶ Restoring habitat quality.
- ▶ Protecting threatened, endangered, vulnerable, keystone or umbrella species.
- ▶ Maintaining or improving hydrological functions.
- ▶ Maintaining or improving environmental quality.

| Type of Land or Water Use | Main Types of Land and Water Use | | | No. of Persons Directly Involved |
|--------------------------------|---|---------------------------|-----------------------------------|----------------------------------|
| | System or Sector | Main Products or Services | Extent (% area of network/length) | |
| ▶ Arable farming/ horticulture | All types of cropping | Grass | >25% | – |
| ▶ Animal husbandry/ rangelands | Traditional, extensive, sedentary; modern, intensive, market-oriented | Cows | – | – |
| ▶ Fisheries | – | – | – | – |
| ▶ Recreation/tourism | All types of tourism and recreation | – | – | – |
| ▶ Infrastructure | – | – | – | – |

CONFLICTS AND OPPORTUNITIES

Main Conflicts Between Biodiversity Conservation and Other Activities

- ▶ Intensive agriculture: drainage.
- ▶ Water management: loss of structural diversity.
- ▶ Barrierers in animal passages: local extinction of itinerant species.

THE PLAN

Proposal/Plan/Programme

- ▶ Type of plan: Visualisation of the relevant ecological structures together with problem areas and with potential corridors.
- ▶ Reference: In preparation.
- ▶ Responsible organisations: The key stakeholders.
- ▶ Plan comes into effect: Not yet known.
- ▶ Implementation complete: Not yet known.
- ▶ Implementing parties: The regions involved.
- ▶ Results achieved: Not yet known.
- ▶ Plan revised: Not yet known.
- ▶ Plan evaluated: Not yet known.

Data Collected

- ▶ Type of data: Ecological, topographical.
- ▶ Method: GIS.
- ▶ Data collected by: Arbeitsgruppe für Regionale Struktur- und Umweltforschung (ARSU), Oldenburg, Federal Republic of Germany.

Monitoring and Evaluation Arrangements

- ▶ Plan monitored/evaluated by: Not yet known.
- ▶ Monitoring/evaluation of results: Not yet known.

Educational/Communication Activities

- ▶ Activities carried out: Quarterly report (Transnational Ecological Network), website (www.ten-project.net).

Legal Status of Network

- ▶ Status: Non-binding government policy initiative.

Budget and Resources

- ▶ Funding: EU (Interreg IIc), project partners.
- ▶ Available resources: ff280,000.

18 Wallonia, Belgium: Ecological Network (Réseau écologique)

GENERAL INFORMATION ON THE NETWORK**Location of the Network**

The region of Wallonia, Belgium.

Responsible Organisations

Ministry of the Wallonia Region, Nature Directorate, Jambes, Belgium.

Main Objectives of the Network

The objective of the network is the overall improvement of the status of Wallonia's biodiversity. Mapping the network should make it possible to determine the area that potentially can be used by wild fauna and flora. The network is also considered to be an instrument capable of involving the non-nature conservation actors (farmers, local interests, enterprises) and thus of ensuring that biological and landscape diversity is taken into account in their sectoral policies.

Main Components of the Network

Core areas, nature development areas, corridors. The configuration of these areas is not yet determined.

Ecosystems Included in the Network

All existing ecosystems in the region.

Species Protected Through the Network

No priority species.

Natural Resource Exploitation Within the Network

Water, forests, quarries.

Relevant Government Policy

Being developed: Nature Action Plan, a regulatory framework under the competence of the Nature Directorate.

Status of Network Plan

- ▶ Main ecological structure: 1:500,000 scale (1992).
- ▶ Ecological Network: 1:10,000 scale for the sectors of land management (in progress).
- ▶ Ecological Network: 1:25,000 scale for the community plans for nature development – PCDN (in progress).

Dimensions of the Network

- ▶ Area: 1,684,400 ha.
- ▶ North-south: 140 km.
- ▶ East-west: 220 km.
- ▶ Areal percentage of core areas in relation to entire network: greater than 50%.

ENVIRONMENTAL CHARACTERISTICS

Main Environmental Units

- ▶ Climatic zones: warm, temperate, rainy climate.
- ▶ Phyto-geographical/vegetation zones: deciduous forests of temperate latitudes.
- ▶ River basins/marine areas: Meuse River basin.

Main Ecosystems Within the Network

- ▶ Forests: 30%.
- ▶ Grasslands: 30%.
- ▶ Inland waters and wetlands: 5%.

Main Environmental Functions of the Network

- ▶ Maintaining or increasing the area of certain habitats.
- ▶ Maintaining or improving the dispersal, migration and/or genetic exchange of certain species.

III NATURAL RESOURCE EXPLOITATION

Main Types of Land and Water Use

| Type of Land or Water Use | System or Sector | Main Products or Services | Extent (% area of network/length) | No. of Persons Directly Involved |
|--------------------------------|--|---------------------------|-----------------------------------|----------------------------------|
| ▶ Arable farming/ horticulture | All types of cropping | Wheat, maize, sugar beet | >25% | – |
| ▶ Animal husbandry/ rangelands | – | Bovids | 10–25% | – |
| ▶ Production forestry | Plantation forest (50%), managed 'natural' forests/ secondary forest (50%) | – | >25% | – |
| ▶ Fisheries | Artisanal, small-scale, inland | Trout | – | – |
| ▶ Industry/energy production | – | – | – | – |
| ▶ Recreation/tourism | Mass recreation, ecotourism/nature observation | – | – | – |
| ▶ Habitation | – | – | – | – |
| ▶ Infrastructure | – | – | – | – |

THE PLAN

Proposal/Plan/Programme

- ▶ Type of plan: Strategic government policy.
- ▶ Reference: Plan d'action pour la Nature (in preparation).
- ▶ Responsible organisation: Ministry of the Wallonia Region, Nature Directorate.
- ▶ Plan comes into effect: End 2000/early 2001.
- ▶ Implementation complete: Not yet known.
- ▶ Implementing parties: Government agencies.
- ▶ Results achieved: Not yet known.
- ▶ Plan revised: Every five years.
- ▶ Plan evaluated: Yes, date not yet known.

Data Collected

- ▶ Type of data: Not yet known.
- ▶ Methods: Not yet known.
- ▶ Data collected by: Not yet known.

Monitoring and Evaluation Arrangements

- ▶ Plan monitored/evaluated by: Not yet known.
- ▶ Monitoring/evaluation of results: Not yet known.

Legal Status of Network

- ▶ Status: To be legally binding (decree).
- ▶ Competent authority: Nature Directorate.
- ▶ Degree of adequacy of legislative framework: Sufficient.

Budget and Resources

- ▶ Funding: Not yet known.
- ▶ Available resources: Not yet known.
- ▶ Increase in funding for biodiversity conservation stimulated by network:
Yes, amount not yet known.

Relation to Other Networks

- ▶ Other known networks: Flemish Ecological Network, Netherlands Ecological Network.
- ▶ Benefits gained from other networks: Methods to configure core areas and nature development areas.
- ▶ Benefits provided to other networks: General experience has benefited Luxembourg ecological network through the Benelux cooperative arrangements.

Further Information

The originality of the Ecological Network planned for Wallonia lies in its multiple aspects:

1. Improving the status of biodiversity
2. Involving non-nature conservation actors
3. Working at the communal level in order to meet the requirements of 1 and 2
4. Coverage of the entire regional territory.

19 Rhineland-Palatinate, Germany: Interwoven Biotope System (Planung vernetzter Biotopsysteme)

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GENERAL INFORMATION ON THE NETWORK

Location of the Network

The entire state of Rhineland-Palatinate. Coordinates:

- ▶ 51°56N–48°58N
- ▶ 6°06E–8°30E.

Responsible Organisations

State Agency for Environmental Protection and Labour Conditions, Oppenheim, Federal Republic of Germany.

Main Objectives of the Network

Conservation of regional species and characteristic habitats, including the historic and cultural heritage.

Main Components of the Network

Habitat preservation areas, habitat development areas, sustainable use areas.

Ecosystems Included in the Network

Various regional ecosystems.

Species Protected Through the Network

- ▶ *Aves*
- ▶ *Lepidoptera*
- ▶ *Carabidae*
- ▶ *Odonata*
- ▶ *Orthoptera*
- ▶ *Makrozoobenthon*
- ▶ *Pisces*
- ▶ *Amphibia*
- ▶ *Reptilia*
- ▶ *Mammalia*
- ▶ *Spermatophyta*

Natural Resources Exploited Within the Network

Groundwater, timber, soil, minerals.

Relevant Government Policy

Nature conservation policy, traffic management policy, spatial planning policy.

Status of Network Plan

Indicative plan, 1991–1999.

Dimensions of the Network

- ▶ Area: 19,846 sq. km.
- ▶ Altitude range: Approx. 60–816 m.
- ▶ Areal percentage of core areas in relation to entire network: Less than 25%.

ENVIRONMENTAL CHARACTERISTICS

Main Environmental Units

- ▶ Climatic zones: Warm, temperate, rainy climate.
- ▶ Phyto-geographical/vegetation zones: Deciduous forests of temperate latitudes.
- ▶ River basins/marine areas: Rhine river basin.

Main Ecosystems Within the Network

- ▶ Forests: Approx. 50%.
- ▶ Grasslands: Approx. 15%.
- ▶ Inland waters and wetlands: Approx. 1–2%.

Main Environmental Functions of the Network

- ▶ Maintaining or increasing the area of certain habitats.
- ▶ Maintaining or improving the dispersal, migration and/or genetic exchange of certain species.
- ▶ Restoring habitat quality.
- ▶ Protecting threatened, endangered, vulnerable, keystone or umbrella species.
- ▶ Conserving valuable landscapes.

NATURAL RESOURCE EXPLOITATION

Main Types of Land and Water Use

| Type of Land or Water Use | System or Sector | Main Products or Services | Extent (% area of network/length) | No. of Persons Directly Involved |
|--------------------------------|--|--|-----------------------------------|----------------------------------|
| ▶ Arable farming/ horticulture | Small-scale, extensive; small-scale, intensive; large-scale, intensive | Cereals, maize, potatoes, wine, vegetables, sugar beet | >25% | – |
| ▶ Animal husbandry/ rangelands | Modern, intensive, market-oriented | Cattle, sheep, horses | – | – |
| ▶ Production forestry | Plantation forest, managed 'natural' forests (secondary forest) | – | >25% | – |
| ▶ Fisheries | Recreational fishing | – | – | – |
| ▶ Industry/energy production | Hydropower, renewable energy | – | – | – |
| ▶ Recreation/tourism | Mass recreation, ecotourism/nature observation, recreational hunting/fishing, cultural experiences | – | – | – |
| ▶ Infrastructure | – | – | – | – |

CONFLICTS AND OPPORTUNITIES

Main Conflicts Between Biodiversity Conservation and Other Activities

- ▶ Agriculture: eutrophication, habitat destruction, chemical pollution and disruption of natural aquatic and soil processes.
- ▶ Forestry: habitat destruction.
- ▶ Infrastructure: expansion of infrastructure leading to habitat loss.
- ▶ Water management: disruption of natural aquatic processes.

Main Opportunities for Mutually Strengthening Biodiversity Conservation and Other Activities

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- ▶ Forestry, water management, agriculture: improved habitat quality, creation of new habitats.

THE PLAN

Proposal/Plan/Programme

- ▶ Type of plan: State regional strategic plan.
- ▶ Responsible organisation: State Agency for Environmental Protection and Labour Conditions.
- ▶ Plan comes into effect: 1991.
- ▶ Implementation complete: Not yet known.
- ▶ Implementing parties: Government agencies.
- ▶ Results achieved: Not yet known.
- ▶ Plan revised: Not yet known.
- ▶ Plan evaluated: In preparation.

Data Collected

- ▶ Type of data: Habitats, key species, potential vegetation.
- ▶ Methods: Surveying, mapping, analytical methods, literature studies.
- ▶ Data collected by: State Agency for Environmental Protection and Labour Conditions.

Associated Research

Minimum viable population studies planned.

Educational/Communication Activities

- ▶ Activities carried out: Provision of information through various media.
- ▶ Activities directed at: All users.

Legal Status of Network

- ▶ Status: Non-binding government policy.

Budget and Resources

- ▶ Funding: US\$2.2 million.
- ▶ Increase in funding for biodiversity conservation stimulated by network: None.

Relation to Other Networks

- ▶ Other known networks: Various.
- ▶ Benefits gained from other networks: Methodological expertise and strategic lessons of Interwoven Biotope Network in Bavaria.
- ▶ Benefits provided to other networks: Methodological expertise and strategic lessons.

Further Information

- ▶ Related initiatives: Implementation of the EU Habitats Directive.
- ▶ Complementary activities: Development of State structure plan and spatial plans, other nature conservation projects.

20 Central Appenines, Italy: PLANECO Project

GENERAL INFORMATION ON THE NETWORK

Location of the Network

Central Appenines (Marche-Umbria-Abruzzo-Lazio-Molise).

Responsible Organisation

University of Aquila, l'Aquila, Italy.

Main Objectives of the Network

To develop and implement methods and criteria for incorporating the environmental continuity concept into the regional action plan.

Main Components of the Network

4 Category II sites, 1 buffer zone, 1 regional park, 10 regional reserves.

Ecosystems Included in the Network

Mountain and river ecosystems.

Species Protected Through the Network

- | | |
|-----------------------|---------------------|
| ▶ Brown bear | <i>Ursus arctos</i> |
| ▶ Wolf | <i>Canis lupus</i> |
| ▶ Ungulates (various) | – |

Natural Resources Exploited Within the Network

Forest, water.

Relevant Government Policy

Regional government policy.

Status of Network Plan

Non-binding.

Dimensions of the Network

- ▶ Area: Approx. 7 million ha.
- ▶ Areal percentage of core areas in relation to entire network: 25–50%.

21 Netherlands: Ecological Network (Ecologische Hoofdstructuur)

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GENERAL INFORMATION ON THE NETWORK

Location of the Network

Territory of the Netherlands.

Responsible Organisation

Ministry of Agriculture, Nature Management and Fisheries, The Hague, Netherlands.

Main Objectives of the Network

- ▶ To create a coherent network of areas and a sustainable basis for ecosystems and species of national and international importance.
- ▶ To stimulate nature to become self-sustaining and self-developing.
- ▶ To develop or restore connectivity between areas of high ecological value.

Main Components of the Network

- ▶ Core areas: Areas where the ecological value is of national or international importance provided they cover at least 500 ha (in the case of natural areas at least 250 ha, in the case of coniferous forests at least 1000 ha). These areas include agricultural areas of historical and scenic value, large lakes and parts of the Wadden Sea and North Sea.
- ▶ Ecological corridors: Areas that facilitate migration and dispersal between core areas.
- ▶ Buffer zones: Areas that help to create sustainable conditions that will enable the desired ecological value to be reached or maintained within the ecological network.
- ▶ Nature development areas: Areas that offer realistic prospects for the development of ecological values of national or international significance.

Ecosystems Included in the Network

- ▶ In the higher (sandy) areas: dunes, heaths, pools, carr peat.
 - ▶ Along the rivers Rhine and Meuse: bypassed meanders, scour holes, marshes.
 - ▶ In the low-lying peatland areas: grasslands, marshes, pools, canals.
 - ▶ In the marine clay area: wet grasslands, marshes, woodlands.
 - ▶ In the inland dune area: young dunes, poor grasslands, scrub, forests.
 - ▶ Cut-off arms of the sea and estuaries.
 - ▶ Tidal areas (mudflats, estuaries).
 - ▶ North Sea.
 - ▶ In the rolling landscape of southern Limburg: brooks, poor grasslands, scrub.
- 'Target nature types' have been drawn up for most important ecosystems found in the Netherlands. These are elaborated in a series of 'model ecosystem' descriptions (heather, forests, dunes, low-lying peatland areas, grasslands, rivers, raised peatlands, delta, brooks). Objectives for the total area of each target nature type have also been set and indicated in more detail in area-based strategies.

Species Protected Through the Network

Priority groups of species:

- ▶ Threatened or vulnerable species.
- ▶ Species for which the Netherlands carries a special international responsibility.
- ▶ Species which have seriously declined due to loss of biotope.
- ▶ Rare species in biotopes characteristic of the Netherlands.

Species to which special attention will be given:

- ▶ Bats
- ▶ Badger
- ▶ Otter
- ▶ Seal
- ▶ Common porpoise
- ▶ Tundra vole
- ▶ Spoonbill
- ▶ Barn owl
- ▶ Geese
- ▶ Kingfisher
- ▶ Grey partridge
- ▶ Crane
- ▶ Black grouse
- ▶ Corncrake
- ▶ Yellow-bellied toad
- ▶ Midwife toad
- ▶ Tree frog
- ▶ Great crested newt
- ▶ Wall lizard
- ▶ Grass snake
- ▶ Weatherfish
- ▶ Spined loach
- ▶ Salmon
- ▶ Sea trout
- ▶ Brown trout
- ▶ Bitterling
- ▶ Pike
- ▶ Ray
- ▶ Dogfish
- ▶ Butterflies
- ▶ Dragonflies
- ▶ Crayfish
- ▶ Arable weeds
- ▶ Marsh marigold
- ▶ Water soldier
- ▶ Snake's head fritillary
- ▶ Bardfield oxlip
- ▶ Yew
- ▶ Lime
- ▶ Orchids
- ▶ Wall plants
- ▶ Scurvy grass
- ▶ Chanterelle

Natural Resources Exploited Within the Network

- ▶ Transport, recreation, fishing (rivers and lakes).
- ▶ Fishing, recreation, transport, natural gas (North Sea and tidal area).
- ▶ Recreation, tourism, military exercises (natural areas such as heather, dunes and peatlands).
- ▶ Farming.
- ▶ Timber.

- ▶ Drinking water (rivers, lakes and aquifers).
- ▶ Minerals (river basins and higher ground).

Relevant Government Policy

- ▶ Nature Policy Plan 1990
- ▶ Strategic Action Plan for Biodiversity 1995
- ▶ Flora and Fauna Act 1997
- ▶ Nature Protection Act 1998
- ▶ National Structure Plan for the Countryside 1995.

Status of Network Plan

Configuration 78% complete (1999). Approx. 28% is subject to an appropriate form of protection or management (1998).

Dimensions of the Network

- ▶ Area: Ultimately approx. 700,000 ha (= 17% of the territory of the Netherlands).
- ▶ North-south: Approx. 300 km.
- ▶ East-west: Approx. 180 km.
- ▶ Altitude range: 0–approx. 400 m.

ENVIRONMENTAL CHARACTERISTICS

Main Environmental Units

- ▶ Climatic zone: Warm, temperate, rainy climate.
- ▶ Phyto-geographical/vegetation zone: Deciduous forests of temperate latitudes.
- ▶ River basins: Estuaries of the Rhine, Meuse and Scheldt.
- ▶ Marine areas: North Sea and Wadden Sea.

Main Ecosystems Within the Network

- ▶ Forests: 71.5%.
- ▶ Grasslands: 6.6%.
- ▶ Inland waters and wetlands: 7.0%.
- ▶ Coastal ecosystems: 5.3%.
- ▶ Raised peat: 1.9%.
- ▶ Inland sand dunes: 0.4%.
- ▶ Heathland: 7.2%.

Main Environmental Functions of the Network

- ▶ Maintaining or increasing the area of certain habitats.
- ▶ Maintaining or improving the dispersal, migration and/or genetic exchange of certain species.
- ▶ Restoring habitat quality.
- ▶ Protecting threatened, endangered, vulnerable, keystone or umbrella species.
- ▶ Maintaining or improving hydrological functions.
- ▶ Maintaining or improving environmental quality.
- ▶ Conserving valuable landscapes and cultural heritage.
- ▶ Protecting geomorphological and geological structure.

NATURAL RESOURCE EXPLOITATION

| Main Types of Land and Water Use | | | | |
|--|---|----------------------------------|--|---|
| Type of Land or Water Use | System or Sector | Main Products or Services | Extent (% area of network/length) | No. of Persons Directly Involved |
| ▶ Arable farming/ horticulture, animal husbandry/ rangelands | – | – | Approx. 14% (in 2018) | – |
| ▶ Production forestry | Managed natural (secondary) forest, plantation forest | – | Approx. 40% (in 2018) | – |

CONFLICTS AND OPPORTUNITIES

Main Conflicts Between Biodiversity Conservation and Other Activities

- ▶ Recreation and tourism.
- ▶ Urbanisation.
- ▶ Agriculture (acidification, eutrophication, soil contamination and disturbance, lowering of water tables).
- ▶ Industry.
- ▶ Infrastructure.
- ▶ Defence.
- ▶ Mineral exploitation.
- ▶ Certain forms of forestry.
- ▶ Groundwater extraction.
- ▶ Fishing and hunting.

Main Opportunities for Mutually Strengthening Biodiversity Conservation and Other Activities

- ▶ Agriculture: Management agreements.
- ▶ Recreation/tourism: Landscape conservation.
- ▶ Infrastructure: Ecological development of roadsides, ecotunnels.
- ▶ Mineral extraction: nature development along rivers.

THE PLAN

Proposal/Plan/Programme

- ▶ Type of plan: Indicative national government policy.
- ▶ Reference: Ministry of Agriculture, Nature Management and Fisheries (1990) Natuurbeleidsplan, Ministry of Agriculture, Nature Management and Fisheries, The Hague.
- ▶ Responsible organisation: Ministry of Agriculture, Nature Management and Fisheries.
- ▶ Plan comes into effect: 1990.
- ▶ Implementation complete: 2018.
- ▶ Implementing parties: Ministry of Agriculture, Nature Management and Fisheries together with the provinces.
- ▶ Results achieved: 2018.
- ▶ Plan revised: 2000.
- ▶ Plan evaluated: Every four years.

Data Collected

- ▶ Type of data: Ecological, socio-economic.
- ▶ Methods: Surveying, mapping, GIS.
- ▶ Data collected by: National Institute for Public Health and Environmental Protection, Alterra.

Monitoring and Evaluation Arrangements

- ▶ Plan monitored/evaluated by: Ministry of Agriculture, Nature Management and Fisheries.
- ▶ Monitoring/evaluation of results: National Institute for Public Health and Environmental Protection, Alterra (annually).

Associated Research

- ▶ Biogeography and population dynamics.
- ▶ Fixing standards in relation to the natural environment.
- ▶ Reference systems.
- ▶ Ecohydrology.
- ▶ Monitoring systems.

Educational/Communication Activities

- ▶ Activities carried out: Nature and environmental education programme, website (www.minlnv.nl).
- ▶ Activities directed at: Various target groups.

Legal Status of Network

- ▶ Status: Indicative government policy.
- ▶ Competent authority: Ministry of Agriculture, Nature Management and Fisheries.

Budget and Resources

- ▶ Funding: National government budget approx. US\$400,000 for site purchase, management and land consolidation (2000).
- ▶ Available resources: National and provincial nature conservation agencies, research institutes.

Relation to Other Networks

- ▶ Other known networks: Various in Europe, international flyways.
- ▶ Benefits provided to other networks: Development of Pan-European Ecological Network.

22 Switzerland: National Ecological Network (Réseau écologique national)

GENERAL INFORMATION ON THE NETWORK

Location of the Network

Territory of Switzerland.

Responsible Organisation

National Office for Environment, Forests and Landscape, Nature Division, Bern, Switzerland.

Main Objectives of the Network

- ▶ To establish at the national and regional level an adequate system of interconnected zones of high biological and landscape priority by means of a 'landscape continuum' of the hydrographic network and ecological corridors.
- ▶ The integration of protected area management and nature, landscape and environmental protection objectives into sectoral economic activities.

Main Components of the Network

- ▶ Core areas of national and supra-regional importance.
- ▶ Corridors of national and supra-regional importance.
- ▶ Nature development zones.
- ▶ 'Landscape continuum'.
- ▶ Buffer zones.

Ecosystems Included in the Network

To be determined. Wetlands will be one of the priority ecosystems.

Species Protected Through the Network

Endangered Swiss species will have priority, such as bats.

Status of Network Plan

In preparation.

ENVIRONMENTAL CHARACTERISTICS

Main Environmental Units

Climatic zones: Warm, temperate, rainy climate; cool, snow-forest climate.

Main Ecosystems Within the Network

To be determined.

Proposal/Plan/Programme

- ▶ Type of plan: Government policy (in preparation).
- ▶ Responsible organisation: National Office for Environment, Forests and Landscape, Nature Division.
- ▶ Plan comes into effect: Not yet known.
- ▶ Implementation complete: Not yet known.
- ▶ Implementing parties: National Office for Environment, Forests and Landscape, Nature Division together with the cantons.
- ▶ Results achieved: Not yet known.
- ▶ Plan revised: Not yet known.
- ▶ Plan evaluated: Not yet known.

Data Collected

Methods: Surveying, mapping, GIS. Maps will be prepared at 1:300,000 and 1:25,000.

Associated Research

- ▶ A study has been undertaken by two expert consultancies in order to prepare synoptic maps of protected areas and potential corridors, as well as a proposal for the establishment of a provisional network. Two cantons are preparing regional landscape development plans.
- ▶ Study on ecological compensation in the agricultural zone of the plain.
- ▶ Study on large corridors for the large fauna of Switzerland.

Relation to Other Networks

Benefits provided to other networks: The network will be designed to contribute to the Pan-European Ecological Network.

23 Cheshire, United Kingdom: Cheshire EConet

GENERAL INFORMATION ON THE NETWORK**Location of the Network**

Territory of the County of Cheshire. Coordinates (UK Grid):

- ▶ 324000–402000 E–W
- ▶ 338000–398000 S–N.

Responsible Organisation

Cheshire County Council, Chester, United Kingdom.

Main Objectives of the Network

- ▶ Halt and reverse deterioration of the natural environment and reverse fragmentation.
- ▶ Promote sustainable development and integrate environmental issues in land use planning and management.

Main Components of the Network

- ▶ Core areas: Category Ia and IV sites, and sites with critical natural capital (heathland, peatland, grassland, ancient woodland and glacial meres).
- ▶ Corridors.
- ▶ Buffer zones.
- ▶ Nature restoration areas.

Ecosystems Included in the Network

- ▶ Heathland.
- ▶ Peatland.
- ▶ Unimproved grassland.
- ▶ Ancient woodland.
- ▶ Glacial meres.

Species Protected Through the Network

To be identified.

Natural Resource Exploitation Within the Network

- ▶ Farming.
- ▶ Mineral extraction (sand quarries).
- ▶ Forestry.

Relevant Government Policy

- ▶ Cheshire County Structure Plan.
- ▶ County Planning Policy.

Status of Network Plan

Indicative plan (in preparation, due 2001).

Dimensions of the Network

- ▶ North-south: 50 km.
- ▶ East-west: 77 km.
- ▶ Altitude range: 0–549 m.

ENVIRONMENTAL CHARACTERISTICS**Main Environmental Units**

- ▶ Climatic zones: Warm, temperate, rainy climate.
- ▶ Phyto-geographical/vegetation zones: Deciduous forests of temperate latitudes.
- ▶ River basins/marine areas: Dee and Mersey river basins.

Main Ecosystems Within the Network

- ▶ Forests: Approx. 5%.
- ▶ Grasslands: Approx. 85%.
- ▶ Mountain systems: Approx. 5%
- ▶ Inland waters and wetlands: Approx. 5%.

Main Environmental Functions of the Network

- ▶ Maintaining or increasing the area of certain habitats.
- ▶ Restoring habitat quality.
- ▶ Conserving valuable landscapes.

NATURAL RESOURCE EXPLOITATION

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| Type of Land or Water Use | System or Sector | Main Products or Services | Extent (% area of network/length) | No. of Persons Directly Involved |
|--------------------------------|---|---|-----------------------------------|----------------------------------|
| ▶ Arable farming/ horticulture | Small-scale, intensive | Winter barley, winter wheat | 10-25% | – |
| ▶ Animal husbandry/ rangelands | Modern, intensive, market-oriented | Dairy cattle, some sheep pigs and poultry | >25% | – |
| ▶ Production forestry | Plantation forest | – | <10% | – |
| ▶ Fisheries | Artisanal, small-scale, coastal; recreational | Shellfish, coarse fishing | – | – |
| ▶ Industry/energy production | Thermal power, mineral extraction, chemical industry | – | – | – |
| ▶ Recreation/tourism | Mass recreation, ecotourism/nature observation, recreational hunting/ fishing, cultural experiences | – | – | – |
| ▶ Habitation | – | – | – | – |
| ▶ Infrastructure | – | – | – | – |

CONFLICTS AND OPPORTUNITIES

Main Conflicts Between Biodiversity Conservation and Other Activities

- ▶ Agriculture: Habitat loss, fragmentation.
- ▶ Industrial development: Habitat loss, fragmentation.
- ▶ Infrastructure: Habitat loss, fragmentation.

THE PLAN

Proposal/Plan/Programme

- ▶ Type of plan: Regional government plan.
- ▶ Responsible organisation: Cheshire County Council.
- ▶ Plan comes into effect: 2001.
- ▶ Implementation complete: 2020.
- ▶ Implementing parties: All stakeholders.
- ▶ Results achieved: 2020.
- ▶ Plan revised: Not yet known.
- ▶ Plan evaluated: Not yet known.

Data Collected

- ▶ Type of data: Ecological, environmental and planning data.
- ▶ Data collected by: Cheshire County Council.

Associated Research

GIS and landscape analysis techniques.

Educational/Communication Activities

Activities carried out: Presentations, articles.

Legal Status of Network

- ▶ Status: Non-binding regional government policy.
- ▶ Competent authority: Cheshire County Council.

Budget and Resources

Funding: Provided by Cheshire County Council, English Nature and EU LIFE programme.

Relation to Other Networks

- ▶ Other known networks: Netherlands (national ecological network and provincial networks in Gelderland and North Brabant).
- ▶ Benefits gained from other networks: Expected as part of LIFE project (the Netherlands and Italy).
- ▶ Benefits provided to other networks: Expected as part of LIFE project (the Netherlands and Italy).

Further Information

- ▶ Related initiatives: Local Agenda 21.
- ▶ Complementary activities: Cheshire Biodiversity Action Plans.

24 Scotland, United Kingdom: Forest Habitat Network

GENERAL INFORMATION ON THE NETWORK**Location of the Network**

Network is expected to be developed nationally. At present plans exist for the Cairngorm area of Scotland incorporating the Forest of Spey, Strathdon and Glenlivet, the Deeside Forest, the Angus Glens and Atholl and Glenshee.

Responsible Organisation

Scottish Natural Heritage, Edinburgh, Scotland.

Main Objectives of the Network

- ▶ To create a woodland resource of relatively limited percentage land cover which, in terms of biodiversity, has the coherence of a larger forested area. It will serve to guide the restoration, expansion and enhancement of native (and other) woodlands in Scotland.
- ▶ In line with UK Forest Policy, the multiple objectives of woodlands are promoted and opportunities to realise concomitant objectives through strategic network planning are being sought. These may include recreational access and transport corridor objectives, landscaping, water and riparian management and potentially resource catchment and socio-economic issues. The Cairngorm example takes account of these other objectives and works to integrate the forest network with other land uses.

Main Components of the Network

The network in the Cairngorms incorporates EU Habitats Directive SACs, National Nature Reserves (IV), and Sites of Special Scientific Interest. Throughout Scotland

such protected areas will be key features for native woodland expansion with a view to consolidating core forest areas. Corridors will be developed and reinforced by policies to expand and link areas of native woodlands. Often these will be associated with riparian woodlands. The corridors will provide habitat connectivity or stepping stones of habitat within other managed or semi-natural habitats. With the emphasis on habitat restoration and expansion, buffer zones are less of a feature. However, sensitive management of surrounding land uses will be sought, e.g. of exotic woodland plantations, and grazing of domestic stock and open hill deer.

Ecosystems Included in the Network

The forest habitat network will prioritise all native woodland habitats, particularly those listed within the Habitats Directive (Atlantic oakwoods, Caledonian pinewoods, floodplain and bog woodlands and Tilio-Acerion gorge woodlands) and the UK Native Woodland Biodiversity Action Plans which encompass most of Scotland's native woodland types.

Species Protected Through the Network

A list of woodland associated UK Biodiversity Action Plan species is available. In the Cairngorms the most notable species are red squirrels, Scottish crossbills and capercaillie.

Natural Resources Exploited Within the Network

Throughout Scotland:

- ▶ Improved agricultural land (arable and grazing).
- ▶ Semi or unimproved heath, moor and grasslands for sheep, cattle and deer (stalking).
- ▶ Plantation forestry using exotic species.
- ▶ Water and water for hydro-electric/freshwater fishing (game).

Relevant Government Policy

- ▶ EU: Habitats Directive Article 10.
- ▶ Scottish Office Development Department: Natural Heritage Planning.
- ▶ Forestry Commission : UK Forestry Standard.
- ▶ Scottish Natural Heritage: Forestry Statement.
- ▶ Cairngorm Partnership: Cairngorm Forestry and Woodland Framework.

Status of Network Plan

Conceptual Framework development (national) 1995. Cairngorm Forestry and Woodland Framework 1999.

Dimensions of the Network

Altitude range: 0–700 m.

ENVIRONMENTAL CHARACTERISTICS

Main Environmental Units

- ▶ Climatic zone: Warm, temperate, rainy climate.
- ▶ Phyto-geographical/vegetation zones: Mixed coniferous/deciduous forests of temperate latitudes, deciduous forests of temperate latitudes.
- ▶ River basins/marine areas:

Main Ecosystems Within the Network

Forests: 100%.

Main Environmental Functions of the Network

- ▶ Maintaining or increasing the area of certain habitats.
- ▶ Maintaining or improving the dispersal, migration and/or genetic exchange of certain species.
- ▶ Restoring habitat quality.
- ▶ Protecting threatened, endangered, vulnerable, keystone or umbrella species.
- ▶ Maintaining or improving hydrological functions.
- ▶ Maintaining or improving environmental quality.
- ▶ Controlling erosion.
- ▶ Conserving valuable landscapes.

The network is seen as a mechanism for helping to deliver multi-objective forestry and will thereby encompass many of these environmental functions in the design of individual areas of woodland within the network. The network is seen as a mechanism for recreating a functioning native forest ecosystem across Scotland. At present native woodland cover is approx. 2% and is often present as small, fragmented and isolated woods.

NATURAL RESOURCE EXPLOITATION

Main Types of Land and Water Use

| Type of Land or Water Use | System or Sector | Main Products or Services | Extent (% area of network/length) | No. of Persons Directly Involved |
|---------------------------|---|---------------------------|-----------------------------------|----------------------------------|
| ▶ Production forestry | Plantation forest, managed 'natural' forests (secondary forest), degraded semi-natural remnants | – | – | >10,000 |

CONFLICTS AND OPPORTUNITIES

Main Conflicts Between Biodiversity Conservation and Other Activities

- ▶ Agriculture: Drainage, overgrazing.
- ▶ Plantation forestry: Displacement.

Main Opportunities for Mutually Strengthening Biodiversity Conservation and Other Activities

- ▶ Agriculture: Grazing management.
- ▶ Stalking: Deer management.
- ▶ Plantation forestry: Habitat restoration and sensitive plantation management.

THE PLAN

Proposal/Plan/Programme

- ▶ Types of plan: Conceptual (national plan), indicative strategic plan (Cairngorms).
- ▶ References: Forest Habitat Network for Scotland, Cairngorms Forest and Woodland Framework.

- ▶ Responsible organisation: Joint steering group of local authorities and other stakeholders (Cairngorms).
- ▶ Plan comes into effect: 1999.
- ▶ Implementation complete: Not yet known.
- ▶ Implementing parties: Government sector partnerships.
- ▶ Results achieved: Not yet known.
- ▶ Plan revised: Not yet known.
- ▶ Plan evaluated: Not yet known.

Relation to Other Networks

- ▶ Other known networks: None.
- ▶ Benefits gained from other networks: None.
- ▶ Benefits provided to other networks: The European Forest Institute is running a summer school on Regional Forest Strategies with field work looking at the Cairngorm example.

Further Information

- ▶ Related initiatives: The Forest Habitat Network will link in with other conservation initiatives across Scotland, in particular the EU SACs of the Natura 2000 network and nationally designated sites. It will also provide a framework for targeting investment towards the UK Biodiversity Action Plans for native woodlands
- ▶ Complementary activities: Scottish Natural Heritage is developing zonal prospectuses for national heritage zones which will help to integrate network development with plans for related habitats and other land uses.
- ▶ Additional remarks: The Forest Habitat Network is a framework for positive development of the native woodland resource rather than solely a mechanism for conserving existing areas of habitat. It is being developed at local levels in various ways by different partner organisations. The conceptual framework for a national network does require formalisation within a national forestry strategy. Work to achieve this is ongoing.

25 Estonia: Network of Ecologically Compensating Areas

GENERAL INFORMATION ON THE NETWORK

Location of the Network

North-Eastern Estonia, Tallinn region, Hiiumaa district, Saaremaa district, North-Western Estonia.

Responsible Organisations

- ▶ General theoretical approach, land-use history and material cycles aspects: Tartu University, Institute of Geography, Tartu, Estonia.
- ▶ Land-use planning, forest biodiversity aspects: Environmental Protection Institute, Tartu, Estonia.

Main Objectives of the Network

To create an optimal territorial infrastructure and to maintain balanced distribution and dynamics of biodiversity. Network planning is oriented at achieving the following goals:

- ▶ to maintain the natural self-regulation of the environment at the level necessary for human existence
- ▶ to protect valuable natural associations
- ▶ to allow sustainable economic management, way-of-life and recreation as well as guarantee the availability of natural zones to the public
- ▶ to maintain and promote historical, cultural and esthetical identity and awareness of the areas of natural and cultural inheritance

Main Components of the Network

Core areas, corridors, buffer zones.

Ecosystems Included in the Network

Those which ensure the preservation of viable populations of local plant and animal species and natural and semi-natural communities that are characteristic of Estonia.

Species Protected Through the Network

No priority species selected to date.

Natural Resources Exploited Within the Network

Forests, peat, fresh water.

Relevant Government Policy

- ▶ Environmental Action Plan.
- ▶ Estonian Forest Policy.

Status of Network Plan

Environmental planning at state and regional levels since 1983, partly completed. Estonian legislation has indirectly supported the ecological network since the 1970s. The legislation provides opportunities to conserve core areas and buffer zones for the protected areas as part of the ecological network, and also natural and semi-natural areas outside protected areas. But the need for natural corridors as pathways for species distribution is not addressed in the legislation yet. However, current legislation supports only selected aspects of a potential ecological network (e.g. coastal areas, shores and banks, sites of species conservation value, areas of existing legal protection etc.) and no comprehensive operational mechanism has not yet been elaborated. The ecological network concept is much better reflected in the strategic planning system. The need for formation and improvement of the network of protected areas can be found in the Estonian Environmental Strategy (1997) as the objective 'to establish [...] by the year 2010 [...] a network of nature reserves corresponding to EU recommendations where zones of strict protection have to cover up to 5% of the terrestrial area of Estonia'. The Estonian Environmental Action Plan (1998) sets out for the period 1998–2000 actions such as the development of the Landscape Act, setting principles for ecological network design and defining elements of the ecological network, and for the period 2001–2006 updating and developing the ecological network concept at the national and regional level, making an economic analysis of the implementation scenario and developing GIS for analytical purposes.

Dimensions of the Network

- ▶ Area: 45,000 sq. km.
- ▶ North-south: 500 km.
- ▶ East-west: 500 km.
- ▶ Altitude range: approx.
- ▶ Longest distance between core areas:
- ▶ Shortest distance between core areas:
- ▶ Areal percentage of core areas in relation to entire network: Less than 25%.

ENVIRONMENTAL CHARACTERISTICS

Main Environmental Units

- ▶ Climatic zone: Warm, temperate, rainy climate.
- ▶ Phyto-geographical/vegetation zones: Non-Boreal coniferous forests.

Main Ecosystems Within the Network

- ▶ Forests: 35%.
- ▶ Grasslands: 15%.
- ▶ Inland waters and wetlands: 20%.
- ▶ Coastal ecosystems: 10%.
- ▶ Pelagic (marine) ecosystems: 5%.

Main Environmental Functions of the Network

- ▶ Maintaining or increasing the area of certain habitats.
- ▶ Maintaining or improving the dispersal, migration and/or genetic exchange of certain species.
- ▶ Restoring habitat quality.
- ▶ Protecting threatened, endangered, vulnerable, keystone or umbrella species.
- ▶ Maintaining or improving hydrological functions.
- ▶ Maintaining or improving environmental quality.
- ▶ Controlling erosion.
- ▶ Conserving valuable landscapes.
- ▶ Saving material and energy, minimise pollution, recycle resources.
- ▶ Providing refuges for wildlife.
- ▶ Providing opportunities for migration of biota.
- ▶ Providing barriers or filters for fluxes of material and energy.
- ▶ Providing a support framework for human settlements.
- ▶ Providing recreation areas.
- ▶ Compensating impacts from human society.

NATURAL RESOURCE EXPLOITATION

| Main Types of Land and Water Use | | | | |
|---|--|----------------------------------|--|---|
| Type of Land or Water Use | System or Sector | Main Products or Services | Extent (% area of network/length) | No. of Persons Directly Involved |
| ▶ Arable farming/ horticulture | In transition | Cereals, potatoes | 10–25% | – |
| ▶ Animal husbandry/ rangelands | Modern, intensive, market-oriented | Cattle | 10–25% | – |
| ▶ Production forestry | Managed 'natural' forests (secondary forest) | – | >25% | – |
| ▶ Fisheries | – | – | – | – |
| ▶ Industry/energy production | Hydropower, thermal power | – | – | – |
| ▶ Recreation/tourism | Mass recreation, ecotourism/nature observation, recreational hunting/fishing, cultural experiences | – | – | – |

CONFLICTS AND OPPORTUNITIES

Main Conflicts Between Biodiversity Conservation and Other Activities

- ▶ Agriculture: Intensification/abandonment.
- ▶ Forestry: Intensive management.
- ▶ Transport: Fragmentation.
- ▶ Industry.
- ▶ Tourism.

Main Opportunities for Mutually Strengthening Biodiversity Conservation and Other Activities

- ▶ Agriculture: Extensification.
- ▶ Forestry: Multifunctional management.
- ▶ Transport: Ecological planning.

THE PLAN

Proposal/Plan/Programme

- ▶ Type of plan: Strategic and regional, local and area plans.
- ▶ References: The Scheme on Nature Protection and Sustainable Use of the Estonian SSR, Eesti Maaehitusprojekt, Tallinn, 1983 (in Estonian); Nature Conservation Scheme for the Tallinn Region, Eesti Maaehitusprojekt, Tallinn, 1985 (in Estonian).
- ▶ Responsible organisations: Consortium of organisations cooperating through the project organisation 'Eesti Maaehitusprojekt'.
- ▶ Plan comes into effect: End 1980s.
- ▶ Implementation complete: Not yet known.
- ▶ Implementing parties: Ministry of Environment.
- ▶ Results achieved: Not yet known.
- ▶ Plan revised: Not yet known.
- ▶ Plan evaluated: Not yet known.

Data Collected

- ▶ Type of data: Ecological, socio-economic, institutional, cultural.
- ▶ Methods: Surveying, mapping, analytical methods.

Monitoring and Evaluation Arrangements

- ▶ Plan monitored/evaluated by: Will be done as part of evaluation process.
- ▶ Monitoring/evaluation of results: No.

Legal Status of Network

- ▶ Status: The term 'ecological network' is used in several items of legislation, but the establishment of the network is not legally binding.
- ▶ Competent authority: Ministry of Environment.

Further Information

The historical development of the Network of Ecologically Compensating Areas in Estonia:

The first principles of the concept of ecological networks at regional level in Estonia were developed already in late 1960s. (Parker, Eilart, 1969; Jagomägi, 1983).

The following studies can be mentioned:

- ▶ The map of the compensating areas in the North-East Estonia was compiled by Heino Luik and Veljo Ranniku in late 1960s.
- ▶ The system of green corridors in Tartu region was worked out (Parker, Eilart, 1969).

At the state level a concept of functional zoning was recognised (Raik, 1971) and the first maps of functional zoning at the national level worked out by the planning institutions (Institute of Building Research, State Project Institute of Amelioration, State Project Institute of Rural Building). The theoretical bases of these maps came from the concept of polarised landscape, which brings together the development of nature and human culture (Rodoman, 1974). In 1979–1985 the Department of Geography, University of Tartu had a project on sustainable use of nature resources and development of plan on nature conservation. For this purposes the comprehensive methodology on network of compensating areas (ecological network) was developed (Jagomägi, 1983; Jagomägi, Raik et al., 1985), inspired by the polarised landscape concept.

The polarised landscape concept means a functional zoning of the landscape elements into natural zones (or ecologically compensating areas) that polarise the antagonistic poles of intensive land use and centres for human activity. The aim of the strongly polarised system is to reduce entropy and increase the self-regulation of a region. In the Estonian case the 'ecological compensation' of the network areas is understood in a broad sense in a variety of functions, i.e.:

- ▶ saving material and energy, minimise pollution, recycle resources
- ▶ provide refuges for wildlife, give possibilities for migration of biota
- ▶ be a barrier or filter for fluxes of material and energy
- ▶ support framework for human settlements
- ▶ provide recreation areas
- ▶ compensate outputs from human society.

This does not mean that the 'ecologically compensating areas' can achieve all environmental and biodiversity objectives. It is one of several approaches to environmental protection. Three general objectives for optimisation are stated:

- ▶ The principle of compensation: changes to the ecological network caused by human exploitation should be compensated by an equally created amount of biotopes. However, under present economic condition this goal is not at all expected to be reached.
- ▶ Landscape polarisation: the increasing contrasts between the centres of human activity and the large natural areas must be 'smoothed out' and regulated by buffer zones.
- ▶ Connectivity: due to a planned renewal of the traffic system there is a need for compensating measures, such as bridges and tunnels for migration.

The ecologically compensating areas are a hierarchical multilevel system, with on the macro scale e.g. large natural core areas, buffer zones and wide corridors, on the meso scale e.g. small core areas, river valleys and semi-natural recreation areas and on the micro scale e.g. wetlands, patches, ponds, hedgerows and ditches. It can then be understood as fairly close to the Estonian NECONET concept of core areas, buffer zones of core areas, corridors and stepping stones, and nature development areas that support resources, habitats and species (Mander et.al., 1995). The ecologically compensating areas in Estonia cover a great deal of the total area, between 20% and 60% in the 15 separate regions, and about 55% of the whole Estonian territory.

26 Hungary: National Ecological Network

GENERAL INFORMATION ON THE NETWORK

Location of the Network

The territory of Hungary. Coordinates:

- ▶ 45 48' and 48 35' N
- ▶ 16 05' and 22 58' E.

Responsible Organisation

Ministry of Environment, National Authority for Nature Conservation, Budapest, Hungary.

Main Objectives of the Network

To be determined.

Main Components of the Network

Core areas, corridors, buffer zones. Final configuration to be defined.

Ecosystems Included in the Network

- ▶ All rivers, streams and their floodplains.
- ▶ Wetlands.
- ▶ Grasslands/steppes.
- ▶ Peats, bogs and marshes.
- ▶ Deciduous forests.

Final configuration to be determined.

Species Protected Through the Network

To be determined.

Natural Resources Exploited Within the Network

Forests, grasslands, wetlands.

Relevant Government Policy

Act of Parliament no. LIII, 1996.

Status of Network Plan

In preparation. Completion due 2000.

Dimensions of the Network

Area: >800,000 ha.

27 Poland: ECONET-Poland (ECONET-Polska)**GENERAL INFORMATION ON THE NETWORK****Location of the Network**

The territory of Poland.

Responsible Organisation

Foundation IUCN Poland, Warsaw, Poland.

Main Objectives of the Network

- ▶ To protect, maintain and enhance biodiversity at species, habitat and landscape structure levels that are representative for Poland as well as endangered and under threat.
- ▶ To facilitate the dispersal of animal and plant species.
- ▶ To provide ecological guidelines for the national sustainable development strategy.

Main Components of the Network

- ▶ Core areas:
 - Category Ia: 105 sites (4682 ha).
 - Category II: 20 sites (28,817 ha).
 - Category III: 1099 sites (125,679 ha).
 - Category IV: 111 sites (2,205,000 ha).
 - Category V: 286,000 ha (protected forests).
 - Category VI: 110 sites (46,000 sq. km, of which 13,000 sq. km protected).
- ▶ Corridors: 59,500 sq. km.

ECONET-Poland covers 46% of the territory of Poland. The network consists of 78 core areas and 110 ecological corridors. It was built up on the basis of a hierarchical model of landscape structure. Spatial connectivity among core areas is a crucial element.

Ecosystems Included in the Network

- ▶ Forests.
- ▶ Peatbogs.
- ▶ Grassland (especially xerothermic, extensive meadows and pastures, heath).
- ▶ Dunes.
- ▶ River and lakes.

- ▶ Mountain ecosystems, alpine and sub-alpine.
- ▶ Traditional, extensive cropland with weeds.
- ▶ Rare and endemic ecosystems.

Species Protected Through the Network

| | |
|----------------------|-----------------------------|
| ▶ Butterflies | <i>Parnadius mnemosyne</i> |
| ▶ Minnow | <i>Phoximus percnurus</i> |
| ▶ Powan | <i>Coregonus lavaretus</i> |
| ▶ Lamellilostral | <i>Charadriiformes</i> |
| ▶ Crane | <i>Grus grus</i> |
| ▶ White-tailed eagle | <i>Haliaeetus albicilla</i> |
| ▶ Bats | – |
| ▶ Otter | <i>Lutra lutra</i> |
| ▶ Lynx | <i>Lynx lynx</i> |
| ▶ Wild cat | <i>Felis silvestris</i> |
| ▶ Wolf | <i>Canis lupus</i> |
| ▶ Orchid | <i>Orchis</i> |

Natural Resources Exploited Within the Network

Timber, peat, game animals.

Relevant Government Policy

Management planning at national and regional scale. 43% of ECONET–Poland is under legal protection, although the establishment of the network as a whole is not a legislative requirement.

Status of Network Plan

The main structure of the network is configured at a scale of 1:500,000 (1995).

Dimensions of the Network

- ▶ Area: 143,700 sq. km.
- ▶ North-south: 1000 km.
- ▶ East-west: 690 km.
- ▶ Altitude range: Up to 2499 m.
- ▶ Longest distance between core areas: Approx. 150 km.
- ▶ Shortest distance between core areas: Adjacent.
- ▶ Areal percentage of core areas in relation to entire network: 25–50%.

ENVIRONMENTAL CHARACTERISTICS

Main Environmental Units

- ▶ Climatic zone: Warm, temperate, rainy climate.
- ▶ Phyto-geographical/vegetation zones: Mountain vegetation; mixed coniferous/deciduous forests of temperate latitudes.
- ▶ River basins/marine areas: Baltic Sea area, Vistula and Odra river basins.

Main Ecosystems Within the Network

- ▶ Forests: 36%.
- ▶ Grasslands: 13%.
- ▶ Mountain systems: 3%.
- ▶ Coastal ecosystems: 1%.
- ▶ Arable land: 40%.

Main Environmental Functions of the Network

- ▶ Maintaining or increasing the area of certain habitats.
- ▶ Maintaining or improving the dispersal, migration and/or genetic exchange of certain species.
- ▶ Restoring habitat quality.
- ▶ Protecting threatened, endangered, vulnerable, keystone or umbrella species.
- ▶ Maintaining or improving hydrological functions.
- ▶ Conserving valuable landscapes.

NATURAL RESOURCE EXPLOITATION

| Main Types of Land and Water Use | | | | |
|---|--|----------------------------------|---|--|
| Type of Land or Water Use | System or Sector | Main Products or Services | Extent (% area of network/length) | No. of Persons Directly Involved |
| ▶ Arable farming/ horticulture | Small-scale, extensive; | Cereals, potatoes | >25% | Approx. 400,000 |
| | large-scale, extensive | Pigs, cows, horses | – | – |
| ▶ Animal husbandry/ rangelands | Traditional, extensive, sedentary | – | – | – |
| ▶ Production forestry | Managed 'natural' forests (secondary forest) | – | >25% | – |
| ▶ Fisheries | Artisanal, small-scale, inland; industrial, large-scale, coastal; fish-farming | Cod, herring, trout | – | 13,600 |
| ▶ Industry/energy production | Hydropower, thermal power | – | – | – |
| ▶ Recreation/tourism | Mass recreation, ecotourism/nature observation | – | – | 21,000,000 tourists/year |
| ▶ Habitation | – | – | – | Protected areas or core areas: 30–90 persons/sq. km (average 76) |
| ▶ Infrastructure | – | – | Railways: approx. 10,725 km, canals: 360 km | – |

CONFLICTS AND OPPORTUNITIES

Main Conflicts Between Biodiversity Conservation and Other Activities

- ▶ Transport: Loss of habitats, barriers.
- ▶ Agriculture: Amalgamation habitats, drainage system.
- ▶ Tourism: Pollution, noise.

Main Opportunities for Mutually Strengthening Biodiversity Conservation and Other Activities

- ▶ Agriculture: Extensive farming protection schemes, wetland recreation.
- ▶ Forestry: Ecological forestry management, afforestation.
- ▶ Fisheries: Reintroduction of endangered species.

THE PLAN

Proposal/Plan/Programme

- ▶ Type of plan: Strategic and regional and local plans.
- ▶ Reference: National Ecological Network ECONET-POLAND, 1995, Liro (ed.), Foundation IUCN-Poland, Warsaw.
- ▶ Responsible organisations: Foundation IUCN, Institute of Physical Planning and Municipal Economy.
- ▶ Plan comes into effect: 1997.
- ▶ Implementation complete: Not yet known.
- ▶ Implementing parties: Not yet known.
- ▶ Results achieved: Probably following implementation of Natura 2000.
- ▶ Plan revised: Not yet known.
- ▶ Plan evaluated: Not yet known.

Data Collected

- ▶ Type of data: Ecological ((bird, bats, wetlands, CORINE biotopes, vascular plants, forest, red data books), Atlas of Poland, protected areas.
- ▶ Methods: surveying, mapping, analytical methods, GIS.
- ▶ Data collected by: Various experts.

Monitoring and Evaluation Arrangements

None.

Associated Research

- ▶ Wetland analyses within ECONET.
- ▶ Afforestation plan.
- ▶ Ecological corridors for main rivers.
- ▶ Endangered coastal habitats.
- ▶ Bird populations in river valleys.

Educational/Communication Activities

- ▶ Activities carried out: Information papers, brochures, several presentations, lecturing, articles in newspapers, radio and television, Internet.
- ▶ Activities directed at: Teachers, planners, students.

Legal Status of Network

- ▶ Status: 46% is already protected, but the network as such does not have any legal status.
- ▶ Competent authority: Ministry for Environment, Natural Resources and Forestry.
- ▶ Degree of adequacy of legislative framework: Not adequate, especially concerning ecological corridors and protection traditional farming against intensification and land consolidation.

Budget and Resources

- ▶ Funding:
 - Designing and developing the network: US\$30,000.
 - Establishing the network: US\$110,000.
 - Managing the network: US\$43.83 million (1994).
- ▶ Available resources: 4069 site wardens, 131 field posts.

Relation to Other Networks

- ▶ Other known networks: Natura 2000, Emerald Network, Parks for Life.
- ▶ Benefits gained from other networks: General ideology and methodological approach, data basis.
- ▶ Benefits provided to other networks: Experiences utilised by other project teams involved in delimitation of ECONET network, e.g. the Baltic States.

Further Information

- ▶ Related initiatives: Wetland protection, development of promotional forest complexes for promotion of the pro-ecological forest policy, agri-environment measures.
- ▶ Complementary activities: Natura 2000.

28 Romania: National Network**GENERAL INFORMATION ON THE NETWORK****Location of the Network**

The territory of Romania.

Responsible Organisation

Ministry of Waters, Forests and Environmental Protection, Bucharest, Romania.

Main Objectives of the Network

To be determined.

Main Components of the Network

Core areas (Category II, III, IV and V sites), water corridors and passes across Carpathian mountains, marine areas, nature restoration areas.

Ecosystems Included in the Network

Danube delta, mountains, dunes, sea shores, fresh waters, peat bogs, marshes, forests, ponds, lakes, caves, grasslands/steppes, sylvo steppes, bushes, rocky formations.

Species Protected Through the Network

Fauna:

- | | |
|----------------------|---------------------------------------|
| ▶ Oystercatcher | <i>Himantopus himantopus</i> |
| ▶ White pelican | <i>Pelecanus onocrotalus</i> |
| ▶ Dalmatian pelican | <i>P. crispus</i> |
| ▶ Great white egret | <i>Egretta alba/Casmerodius albus</i> |
| ▶ Little egret | <i>E. garzetta</i> |
| ▶ Ruddy shelduck | <i>Casarca ferruginea</i> |
| ▶ Common shelduck | <i>Tadorna tadorna</i> |
| ▶ Eurasian spoonbill | <i>Platalea leucorodia</i> |
| ▶ Capercaillie | <i>Tetrao urogallis</i> |
| ▶ Black grouse | <i>Lyrurus tetrix</i> |
| ▶ Monk vulture | <i>Aegypius monachus</i> |
| ▶ Golden eagle | <i>Aquila chrysaetos</i> |
| ▶ Egyptian vulture | <i>Neophron percnopterus</i> |

| | |
|--|-------------------------------|
| ▶ Griffon vulture | <i>Gyps fulvus</i> |
| ▶ Lammergeier | <i>Gypaetus barbatus</i> |
| ▶ Great bustard | <i>Otis tarda</i> |
| ▶ Little bustard | <i>O. tetrax</i> |
| ▶ Spur-thighed Mediterranean land tortoise | <i>Testudo graeca iberica</i> |
| ▶ Spur-tailed Mediterranean land tortoise | <i>T. hermanni hermanni</i> |
| ▶ Chamois | <i>Rupicapra rupicapra</i> |
| ▶ Eurasian lynx | <i>Felis lynx</i> |

Flora:

| | |
|---------------------------|--|
| ▶ Pine species | <i>Pinus cembra</i> |
| ▶ Larch species | <i>Larix decidua var. polonica</i> |
| ▶ Globe flower | <i>Trollius europaeus</i> |
| ▶ Alpenrose species | <i>Rhododendron kotschyi</i> |
| ▶ Vanilla orchid species | <i>Nigritella rubra</i> |
| ▶ Black vanilla | <i>N. nigra</i> |
| ▶ Lady's slipper | <i>Cypripedium calceolus</i> |
| ▶ Lily of the valley | <i>Convallaria majalis</i> |
| ▶ Grass-leaved iris | <i>Iris graminea</i> |
| ▶ Crocus species | <i>Crocus moesicus (?=maesiacus)</i> |
| ▶ Snake's head fritillary | <i>Fritillaria meleagris</i> |
| ▶ Butcher's broom | <i>Ruscus aculeatus</i> |
| ▶ Daphne species | <i>Daphne blagayana</i> |
| ▶ Garland flower | <i>D. cneorum</i> |
| ▶ Peony species | <i>Paeonia peregrina var. romanica</i> |
| ▶ Great yellow gentian | <i>Gentiana lutea</i> |
| ▶ Angelica species | <i>Angelica arhangolica</i> |
| ▶ Yew | <i>Taxus baccata</i> |
| ▶ Edelweiss | <i>Leontopodium alpinum</i> |
| ▶ Water-lily species | <i>Nymphaea lotus thermalis</i> |
| ▶ Pea-tree species | <i>Caragana arborescens</i> |

Natural Resource Exploitation Within the Network

Agriculture, fisheries, tourism.

Relevant Government Policy

Government policy under development.

Status of Network Plan

Indicative plan (in preparation).

Dimensions of the Network

Not yet determined.

ENVIRONMENTAL CHARACTERISTICS

Main Environmental Units

- ▶ Climatic zone: Warm, temperate, rainy climate.
- ▶ Phyto-geographical/vegetation zones: Mountain vegetation; non-Boreal coniferous forests; mixed coniferous/deciduous forests of temperate latitudes; deciduous forests of temperate latitudes; steppe (short grass).
- ▶ River basins/marine areas:

Main Ecosystems Within the Network

- ▶ Forests.
- ▶ Grasslands.
- ▶ Mountain systems.
- ▶ Inland waters and wetlands.
- ▶ Coastal ecosystems.

Main Environmental Functions of the Network

- ▶ Maintaining or increasing the area of certain habitats.
- ▶ Maintaining or improving the dispersal, migration and/or genetic exchange of certain species.
- ▶ Restoring habitat quality.
- ▶ Protecting threatened, endangered, vulnerable, keystone or umbrella species.
- ▶ Maintaining or improving hydrological functions.
- ▶ Maintaining or improving environmental quality.
- ▶ Controlling erosion.
- ▶ Conserving valuable landscapes.

NATURAL RESOURCE EXPLOITATION

Main Types of Land and Water Use

| Type of Land or Water Use | System or Sector | Main Products or Services | Extent (% area of network/length) | No. of Persons Directly Involved |
|--------------------------------|--|---|-----------------------------------|----------------------------------|
| ▶ Arable farming/ horticulture | – | Wheat, maize, technical crops, grapes, fruit (orchards), vegetables | – | – |
| ▶ Animal husbandry/ rangelands | Traditional, extensive (semi-)nomadic; traditional, extensive, sedentary; modern, intensive, market-oriented | Sheep, horned cattle, horses, pigs, poultry | – | – |
| ▶ Production forestry | – | – | – | – |
| ▶ Fisheries | Artisanal, small-scale, inland; artisanal, small-scale, coastal; industrial, large-scale, inland; industrial, large-scale, coastal; fish-farming | – | – | – |
| ▶ Industry/energy production | Hydropower | – | – | – |
| ▶ Recreation/tourism | Mass recreation, ecotourism/nature observation, recreational hunting/fishing | – | – | – |
| ▶ Habitation | – | – | – | – |
| ▶ Infrastructure | – | – | – | – |
| ▶ Cultural/religious values | – | – | – | – |

THE PLAN**Proposal/Plan/Programme**

- ▶ Type of plan: Strategic, regional and local plans, management plan (Danube delta).
- ▶ Responsible organisation: Ministry of Waters, Forest and Environmental Protection.
- ▶ Plan comes into effect: Not yet known.
- ▶ Implementation complete: Not yet known.
- ▶ Implementing parties: Not yet known.
- ▶ Results achieved: Not yet known.
- ▶ Plan revised: Not yet known.
- ▶ Plan evaluated: Not yet known.

Data Collected

Type of data: Ecological, socio-economic, institutional, cultural.

Educational/Communication Activities

- ▶ Activities carried out: Publications, natural monument appeals, exhibitions of posters, books, brochures, excursions, films etc.
- ▶ Activities directed at: All levels of education, NGOs, general population.

29 Slovakia: Territorial System of Ecological Stability

GENERAL INFORMATION ON THE NETWORK**Location of the Network**

The territory of the Slovak Republic. Coordinates:

- ▶ Between 16° 50' 05' and 22° 34' 04' E.
- ▶ Between 47° 43' 54' and 49° 36' 52' N.

Responsible Organisations

- ▶ Ministry of Environment, Bratislava, Slovakia.
- ▶ Slovak Environmental Agency – Centre for Nature and Landscape Protection, Banská Bystrica, Slovakia.

Main Objectives of the Network

Protection of representative and unique ecosystems; conservation of biodiversity in its variability in natural conditions; maintenance of unique landscape phenomena; establishment of positive influence on agriculture and forest cultivations and urban areas; support of possibility of multifunctional land use.

Main Components of the Network

Core areas (164), corridors (2700 km).

Ecosystems Included in the Network

Forest ecosystems have priority.

Species Protected Through the Network

Priority species:

- ▶ Large mammals
 - Canis lupus*
 - Lynx lynx*
 - Ursus arctos*
- ☞ Trees
 - Fagus sylvatica*
- ▶ Game species
 - Cervus elaphus*
 - Capreolus capreolus*
- ▶ Fish
 - Hucho hucho*
 - Salmo trutta*
 - Salmo salar*
- ▶ Mammals
 - Mammalia*
 - Castor fiber*
 - Lutra lutra*
 - Rupicapra rupicapra*
- ▶ Birds
 - Ardea purpurea*
 - Aquila heliaca*
 - Bubo bubo*
 - Egretta alba*
 - Egratta garzetta*
 - Tichodroma muraria*
- ▶ Reptiles
 - Emys orbicularis*
 - Elaphe longissima*
- ▶ Insects
 - Amphibia:
 - Triturus monrtadoni*
 - Saga pedo*
 - Parnassius apollo*
 - Vaccinia optilete*
 - Mantis religiosa*
- ▶ Molluscs
 - Trichia bielzii*
 - Tricia filicina*
 - Planoprbis carinatus*
 - Belgrandiella slovenica*
 - Chondrina tatriva*
 - Deroceras fatrense*
- ▶ Plants
 - Abies alba*
 - Amelanchier ovalis*
 - Dryas octopetala*
 - Draba klastersky*
 - Gentiana clusii*
 - Ophrys apifera*, *Orchis coriophora*
 - Pinus cembra*
 - Ranunculus illyricus*

Natural Resources Exploited Within the Network

Forests, water (hydropower), wetlands, grasslands, game.

Relevant Government Policy

- ▶ Resolution of the Slovak government No 394/1991 on the proposal of the TSES concept.
- ▶ Resolution of the Slovak Government No 319/92 which approved Supraregional TSES of SR and prepared regional level.

Status of Network Plan

- ▶ General Framework of the Territorial System of Ecological Stability.
- ▶ 38 Regional Territorial Systems of Ecological Stability.
- ▶ Local Territorial Systems of Ecological Stability.

Dimensions of the Network

- ▶ Area: 2716 sq. km.
- ▶ North-south: 197 km.
- ▶ East-west: 429 km.
- ▶ Altitude range: 94–2655 m.
- ▶ Areal percentage of core areas in relation to entire network: >50%.

ENVIRONMENTAL CHARACTERISTICS**Main Environmental Units**

- ▶ Climatic zones: Dry climate; warm, temperate, rainy climate.
- ▶ Phyto-geographical/vegetation zones: Mountain vegetation; non-Boreal coniferous forests, mixed coniferous/deciduous forests of temperate latitudes; deciduous forests of temperate latitudes; steppe (short grass).
- ▶ River basins/marine areas: Danube and Wisla rivers, Baltic Sea, Black Sea.

Main Ecosystems Within the Network

- ▶ Arable farming/horticulture: 5%.
- ▶ Forests: 70%.
- ▶ Grasslands: 10%.
- ▶ Mountain systems: 10%.
- ▶ Inland waters and wetlands: 5%.

Main Environmental Functions of the Network

- ▶ Maintaining or increasing the area of certain habitats.
- ▶ Maintaining or improving the dispersal, migration and/or genetic exchange of certain species.
- ▶ Restoring habitat quality.
- ▶ Protecting threatened, endangered, vulnerable, keystone or umbrella species.
- ▶ Maintaining or improving hydrological functions.
- ▶ Maintaining or improving environmental quality.
- ▶ Controlling erosion.
- ▶ Conserving valuable landscapes.

| Main Types of Land and Water Use | | | | |
|---|---|----------------------------------|--|---|
| Type of Land or Water Use | System or Sector | Main Products or Services | Extent (% area of network/length) | No. of Persons Directly Involved |
| ▶ Arable farming/ horticulture | Small-scale, extensive | Potatoes, cereals | >10% | – |
| ▶ Production forestry | Managed 'natural' forests (secondary forest), primary forests not yet exploited | – | 10–25% | – |
| ▶ Fisheries | Artisanal, small-scale, inland; fish-farming | Carp, trout | – | – |
| ▶ Industry/energy production | Hydropower | – | – | – |
| ▶ Recreation/tourism | Mass recreation, ecotourism/nature observation, recreational hunting/ fishing, spas | – | – | – |
| ▶ Habitation | – | – | – | – |
| ▶ Infrastructure | – | – | Roads: 150 km, railways: 20 km | – |

CONFLICTS AND OPPORTUNITIES

Main Conflicts Between Biodiversity Conservation and Other Activities

- ▶ Forest management: Logging practices.
- ▶ Agriculture: Reduction of green vegetation, inappropriate land reclamation.
- ▶ Water management: Water management structure.

Main Opportunities for Mutually Strengthening Biodiversity Conservation and Other Activities

- ▶ Forest management: Planting native species.
- ▶ Agriculture: Traditional management of meadows, pasture and grass improvement.
- ▶ Water management: Revitalising watercourses.

THE PLAN

Proposal/Plan/Programme

- ▶ Type of plan: Strategic, regional and local plans.
- ▶ Reference: General Framework of the Territorial System of Ecological Stability, 1992. Revision 1998/99.
- ▶ Responsible organisations: Ministry of Environment, regional and local authorities, Slovak Environment Agency.
- ▶ Plan comes into effect: 1992 (national framework).
- ▶ Implementation complete: Not yet known.
- ▶ Implementing parties: National, regional and local government authorities.
- ▶ Results achieved: Not yet known.
- ▶ Plan revised: 1998/99.
- ▶ Plan evaluated: Not yet known.

Data Collected

- ▶ Type of data: Ecological, socio-economic, institutional, cultural.
- ▶ Methods: Surveying, mapping, analytical methods, GIS, remote sensing.
- ▶ Data collected by: Scientific and government agencies.

Monitoring and Evaluation Arrangements

- ▶ Plan monitored/evaluated by: Ministry of Environment.
- ▶ Monitoring/evaluation of results: Ministry of Environment, regional and local authorities.

Associated Research

Studies on corridors for (Comenius University, Faculty of Natural Sciences).

Educational/Communication Activities

- ▶ Activities carried out: Articles, television programmes, excursions, exhibitions, competitions, information materials, slides, videos, curriculum biodiversity conservation/ecological networks at Comenius University.
- ▶ Activities directed at: Wide range of groups.

Legal Status of Network

- ▶ Status: Legally binding, amended Territorial Planning Act (no. 50/1976), Nature and Landscape Protection Act (no. 287/1994).
- ▶ Competent authority: Ministry of Environment.
- ▶ Degree of adequacy of legislative framework: Adequate for establishing basic framework.

Relation to Other Networks

Other known networks: Natura 2000.

Further Information

Additional remarks: Biodiversity conservation is one of the objectives of the spatial planning system.

30 Moldova: Econetwork**GENERAL INFORMATION ON THE NETWORK****Location of the Network**

The territory of Moldova. Coordinates:

- ▶ Latitude approx. 46° 20'–46° 46' N.
- ▶ Longitude approx. 29° 33'–29° 57' E.

Responsible Organisation

BIOTICA Ecological Society, Kishinev, Moldova.

Main Objectives of the Network

- ▶ Creation of a system for integral management of totality of diverse protected and unprotected habitats for conservation of endangered and other species including mass and very rare transboundary migrating birds.
- ▶ To restore some natural resources, to help achieve sustainable land use and to strengthen water protection.

Main Components of the Network

- ▶ Core areas, including 4 Category IV sites (335 ha) and 1 Category V site (224 ha).
- ▶ Corridors.
- ▶ Nature restoration areas, including fish spawning sites, protected fragments of rivers, productive forestry, etc.

Ecosystems Included in the Network

Wetlands, steppe.

Species Protected Through the Network

- | | |
|-----------------------|---|
| ▶ Wetland vertebrates | – |
| ▶ Otter | <i>Lutra lutra</i> L. |
| ▶ Black stork | <i>Ciconia nigra</i> L. |
| ▶ Corn crane | <i>Crex crex</i> L. |
| ▶ Upland vertebrates: | <i>Hieraaetus pennatus</i> L. |
| | <i>Coronella austriaca</i> Laur. |
| | <i>Elaphe longissima</i> Laur. |
| ▶ Insects | <i>Lucanus cervus</i> L. |
| | <i>Scolia maculata</i> Drury |
| | <i>Callimorpha quadripunctaria</i> Poda |
| ▶ Plants | <i>Achillea coarctica</i> Poir |
| | <i>Euonumus nana</i> Bieb. |
| | <i>Ornithogallum orioides</i> Zahar |

Natural Resources Exploited Within the Network

Soil, water, forests.

Relevant Government Policy

- ▶ National Environmental Action Plan (Ministry of Environment).
- ▶ GEF project programme (in preparation).
- ▶ The new reserve 'Talmaza wetland' is planned to be linked by ecological corridors with the Ukrainian protected areas in the Dniester river delta in the proposed Moldavian–Ukrainian [inter]national park.

Status of Network Plan

Dimensions of the Network

- ▶ Area: 2500–3000 ha. network components extending over an area of approx. 240 sq. km.
- ▶ North-south: Approx. 30 km.
- ▶ East-west: Approx. 30 km.
- ▶ Altitude range: 0–200 m.
- ▶ Longest distance between core areas: 16 km.
- ▶ Shortest distance between core areas: 2 km.
- ▶ Areal percentage of core areas in relation to entire network: 25-50%.

ENVIRONMENTAL CHARACTERISTICS

Main Environmental Units

- ▶ Climatic zone: Warm, temperate, rainy climate.
- ▶ Phyto-geographical/vegetation zones: Deciduous forests of temperate latitudes, steppe (short grass).
- ▶ River basins/marine areas: The Dniester river basin.

Main Ecosystems Within the Network

- ▶ Forests: 80% (including 60–65% floodplain forest).
- ▶ Grasslands: 10% (including meadows and steppe remains).
- ▶ Inland waters and wetlands: Approx. 5%.
- ▶ Secondary weed associations, substitute meadows: Approx. 5%.

Main Environmental Functions of the Network

- ▶ Maintaining or increasing the area of certain habitats.
- ▶ Maintaining or improving the dispersal, migration and/or genetic exchange of certain species.
- ▶ Restoring habitat quality.
- ▶ Protecting threatened, endangered, vulnerable, keystone or umbrella species.
- ▶ Maintaining or improving hydrological functions.
- ▶ Maintaining or improving environmental quality.
- ▶ Controlling erosion.
- ▶ Conserving valuable landscapes.

NATURAL RESOURCE EXPLOITATION

Main Types of Land and Water Use

| Type of Land or Water Use | System or Sector | Main Products or Services | Extent (% area of network/length) | No. of Persons Directly Involved |
|--------------------------------|--|---------------------------------------|-----------------------------------|----------------------------------|
| ▶ Arable farming/ horticulture | Small-scale, extensive; large-scale, extensive; transitional stages from large-scale intensive system to small-scale extensive on arable lands | Sunflowers, wheat, grapes, vegetables | >25% | 20–30,000 |
| ▶ Animal husbandry/ rangelands | Sedentary, with grazing mainly in mixed style; private livestock in collective herds; grazing on the state lands | Cattle, sheep | <10% | – |
| ▶ Production forestry | Plantation forest; managed 'natural' forests (secondary forest); irregularly exploited primary forest | – | >25% | – |
| ▶ Fisheries | Artisanal, small-scale, inland; fish-farming | – | – | Approx. 1000 |
| ▶ Industry/energy production | Canning, wine-making | – | – | – |
| ▶ Recreation/tourism | Ecotourism/nature observation; recreational hunting/ fishing; irregular short-time rest in the natural and seminatural sites | – | – | Approx. 300 |
| ▶ Habitation | – | – | – | Zero in core areas |
| ▶ Infrastructure | – | – | Roads approx. 100 km | – |

Main Conflicts Between Biodiversity Conservation and Other Activities

- ▶ Political: Moldavian-Transnistrian conflict, starting in 1991.
- ▶ Forestry: Mass illegal logging by local population, forestry land withdrawn for conservation, landowners conflict between local authorities and state forestry company.
- ▶ Agriculture: No control over grazing, absence of legal controls.

Main Opportunities for Mutually Strengthening Biodiversity Conservation and Other Activities

- ▶ Agriculture: Sustainable agriculture.
- ▶ Agro-ecotourism: Development of agro-ecotourism in protected areas.
- ▶ Forestry: Forestry investment and sustainable development.
- ▶ Civil society: Public participation in decision making on environmental matters.

THE PLAN**Proposal/Plan/Programme**

- ▶ Type of plan: Independent strategic and management plans.
- ▶ Reference: In preparation.
- ▶ Responsible organisation: BIOTICA Ecological Society (NGO), supported by GEF in agreement with Ministry of Environment.
- ▶ Plan completed: 2001.
- ▶ Implementation complete: 2004 (proposes).
- ▶ Implementing parties: Not yet known.
- ▶ Results achieved: Not yet known.
- ▶ Plan revised: 2010 (proposed).
- ▶ Plan evaluated: Not yet known.

Data Collected

- ▶ Type of data: Ecological, socio-economic, institutional, cultural.
- ▶ Methods: Surveying and mapping, analytical methods, GIS, remote sensing.
- ▶ Data collected by: BIOTICA Ecological Society.

Monitoring and Evaluation Arrangements

- ▶ Plan monitored/evaluated by: Not yet known.
- ▶ Monitoring/evaluation of results: Not yet known.

Legal Status of Network

Status: Non-binding independent initiative.

Relation to Other Networks

Other known networks: None.

Further Information

Related initiatives: Biodiversity Conservation Strategy (GEF project, in preparation).

31 Central Russia, Russian Federation: Heart of Russia

GENERAL INFORMATION ON THE NETWORK

Location of the Network

The network boundaries coincide with administrative boundaries of the Tver, Yaroslavl, Vladimir, Ryazan, Kaluga and Smolensk regions of the Russian Federation and include the Moscow region surrounded by the six regions mentioned above as well as the Moscow City region within the Moscow region. Coordinates:

- ▶ 58° 55' N, 52° 55' N.
- ▶ 42° 58' E, 30° 43' E.

Responsible Organisation

Laboratory for Applied Ecology, Moscow, Russian Federation.

Main Objectives of the Network

- ▶ The conservation of native biodiversity.
- ▶ To provide the possibility of ecological stability and sustainable development by means of maintaining or restoring the native biodiversity.

Main Components of the Network

- ▶ Core areas:
 - Category Ia sites (Zapovedniks = strict scientific nature reserves).
 - Category II sites (national parks, nature parks).
 - Category III sites (natural monuments).
 - Category IV sites (Zakazniks/natural refuges and wildlife sanctuaries, forest reserves, forests of scientific value).
 - Category VI sites: Zakazniks/game preserves).
- ▶ Corridors:
 - Water protection zones (along rivers, around lakes and reservoirs) as linear landscape features.
 - Forests in the First Category as landscape matrix.
 - Legally protected 'natural monuments' as stepping stones for migratory species.
 - Core areas that function as stepping stones in the ecological network at the higher level (transregional and transcontinental).
- ▶ Buffer zones:
 - Protection zones adjacent to zapovedniks, national parks, natural monuments and zakazniks.
 - Forest parks.
 - Historical and cultural reserves (those with a natural or semi-natural character).

Ecosystems Included in the Network

Natural and semi-natural ecosystems with rich native biodiversity: broad-leaved, spruce and pine forests, meadow steppe, different kinds of meadows, bogs and wetlands, lakes.

Species Protected Through the Network

Several hundreds of species are entered on the Russian Federation and regional Red Lists, including:

- ▶ Mammals (≥ 10), including:
 - Russian Desman *Desmana mochata*
 - Giant noctule *Nyctalus lasiopterus*
 - Brown bear *Ursus arctos*
 - Eurasian otter *Lutra lutra*
 - Northern lynx *Lynx lynx*
 - Great jerboa *Allactaga major*

- ▶ Birds (≥ 62), including:
 - Black-throated diver *Gavia arctica*
 - Little grebe *Podiceps ruficollis*
 - Red-necked grebe *Podiceps grisegena*
 - Black stork *Ciconia nigra*
 - Mute swan *Cygnus olor*
 - Whooper swan *Cygnus cygnus*
 - Osprey *Pandion haliaetus*
 - Short-toed eagle *Circus gallicus*
 - Spotted eagle *Aquila clanga*
 - Golden eagle *Aquila chrysaetos*
 - White-tailed eagle *Haliaeetus albicilla*
 - Common crane *Grus grus*
 - Oyster catcher *Haematorus ostralegus*
 - Great snipe *Gallinago media*
 - Half (jack) snipe *Lymnecryptes minima*
 - Curlew *Numenius arquata*
 - Eagle owl *Bubo bubo*
 - Great (grey) shrike *Lanius excubitor*
 - Aquatic warbler *Acrocephalus paludicola*
 - Yellow-breasted bunting *Emberiza aureola*

- ▶ Reptiles (≥ 5), including:
 - Coronella austriaca*
- ▶ Amphibians (≥ 3)
 - Amphibia*
- ▶ Fish (≥ 10), including:
 - European grayling *Thymallus thymallus*
 - Freshwater sculpin *Cottus gobio*
 - Seven-eyes *Lampetra planeri*
- ▶ Insects (≥ 291 taxa), including:
 - ▶ Dragonflies *Odonatoptera*
 - ▶ Grasshoppers, including:
 - – *Poecilimon intermedius*
 - – *Oedipoda coerulea*
- ▶ Beetles, including:
 - Common stag beetle *Lucanus cervus*
 - – *Osmoderma eremita*
 - Ground beetle *Carabus menetriesi*
- ▶ Butterflies, including:
 - Apollo *Parnassius apollo*
 - Large blues *Maculinea spp. (5)*
 - Scarce heath *Coenonympha hero*

- ▶ Moths, including:
 - Emperor Moth *Eudia pavonia*
 - – *Lemonia spp. (2)*
 - Scarlet tiger *Callimorpha dominula*
- ▶ Bees, including:
 - – *Orussus abietinus*
 - Carpenter bee *Xylocopa valga*
 - Bumblebee *Bombus fragrans*
- ▶ Shellfish (≥ 13) *Crustacea*
- ▶ Spiders (≥ 1), including:
 - Wolf spider *Lycosa singoriensis*
- ▶ Millipeds (≥ 1) *Diplopoda*
- ▶ Annelid worms *Annelides (≥ 1)*
- ▶ Molluscs (≥ 8), including:
 - Gastropods *Vertigo moulinsiana*
 - – *Merdigera obscura*
- ▶ Vascular plants of the dark coniferous taiga forests (≥ 250), including:
 - – *Diplasium sibiricum*
 - Woodreed *Cinna latifolia*
 - Coralroot *Corallorhiza trifida*
 - – *Goodyera repens*
 - – *Coeloglossum viride*
 - – *Moneses uniflora*
- ▶ Vascular plants of the pine forests with 'green mosses', including:
 - – *Gymnadenia conopsea*
 - Houseleek *Jovibarba sobolifera*
 - Woodwaxen *Genista germanica*
- ▶ Vascular plants of the pine forests with *Festuca polesica*, including:
 - Sandwort saxatilis *Arenaria saxatilis*
 - Sand pink *Dianthus arenarius*
 - Sand wetch *Astragalus arenarius*
 - Centaury *Centaurea marschalliana*
- ▶ Vascular plants of the coniferous/broad-leaved (sub-Boreal) forests, including:
 - Yellow lady's slipper *Cypripedium calceolus*
 - Helleborine *Cephalanthera longifolia*
 - Currant *Ribes spicatum*
- ▶ Vascular plants of the European broad-leaved forests, including:
 - – *Laserpitium latifolium*
 - Sticky sage *Salvia glutinosa*
 - Thistle *Cirsium pannonicum*
- ▶ Vascular plants of the oak forests within the forest-steppe zone, including:
 - Martagon lily *Lilium martagon*
 - – *Adenophora lilifolia*

- ▶ Vascular plants of the lakes, including:
 - Quillwort (lycophyta) *Isoetes lacustris*
 - – *Isoetes setacea*
 - – *Najas tenuissima*
 - Fen featherfoil *Hottonia palustris*
 - Caltrop *Trapa natans s.l.*
- ▶ Vascular plants of the fens and marshes, including:
 - Sedge *Carex dioica*
 - Fen epipactis *Epipactis palustris*
- ▶ Vascular plants of the peat moss bogs, including:
 - White beak sedge *Rhynchospora alba*
 - Traunsteiner's orchis *Dactylorhiza traunsteineri*
 - English sundew *Drosera anglica*
 - Bog (wild) cranberry *Oxycoccus microcarpus*
- ▶ Vascular plants of meadow steppes, including:
 - Feather grass *Stipa pennata*
 - – *Stipa pulcherrima*
 - – *Stipa tirsia*
 - Flax *Linum perenne*
 - Aster *Aster amellus*
- ▶ Vascular plants of forest-steppe ecotones, including:
 - Fritillary *Fritillaria ruthenica*
 - Monkshood *Aconitum nemorosum*
 - – *Cotoneaster alaunicus*
 - Vetchling *Lathyrus pallescens*
 - – *Galatella rossica*
- ▶ Mosses (≥ 37) *Musci*
- ▶ Algae (≥ 3) *Algae*
- ▶ Lichens (≥ 24), including:
 - – *Lobaria pulmonaria*
 - – *Usnea spp. (≥ 8)*
- ▶ Fungi (≥ 23) *Fungi*

Natural Resources Exploited Within the Network

Forest for timber, meadows for grazing and haymaking, natural areas for recreation.

Relevant Government Policy

- ▶ Protected area system development plans of Moscow City, Moscow, Tver, Yaroslavl, Kaluga regions (to be adopted by regional authorities).
- ▶ Plans under development in the Vladimir, Ryazan, Smolensk regions.

Status of Network Plan

Non-governmental plan based on regional governmental plans and additional research: first draft 1997, elaborate network plan 2001, develop network 2005. Regional conservation agencies work in their administrative regions. The group of the NGOs and research centres are developing the common network plan in coordination with corresponding conservation agencies in each region and are assisting them realising the appropriate part of the plan.

Dimensions of the Network

- ▶ Area: 210,000 sq. km.
- ▶ North-south: 668 km.
- ▶ East-west: 781 km.
- ▶ Altitude range: 67–343 m.
- ▶ Areal percentage of core areas in relation to entire network: Less than 25%.

ENVIRONMENTAL CHARACTERISTICS**Main Environmental Units**

- ▶ Climatic zone: Cool, snow-forest climate.
- ▶ Phyto-geographical/vegetation zones: Boreal forests (taiga); non-Boreal coniferous forests; mixed coniferous/deciduous forests of temperate latitudes; deciduous forests of temperate latitudes; sSteppe (short grass).
- ▶ River basins/marine areas: Volga river (Caspian basin), Don river (Azov Sea basin), Dnieper river (Black basin), West Dwina/Daugava river and Neva river (Baltic Sea basin).

Main Ecosystems Within the Network

- ▶ Forests: 69%.
- ▶ Grasslands: meadows and meadow steppes: 20%; shrubs between grasslands: 3%.
- ▶ Inland waters and wetlands: inland waters: 4%; wetlands: 4%.

Main Environmental Functions of the Network

- ▶ Maintaining or increasing the area of certain habitats.
- ▶ Maintaining or improving the dispersal, migration and/or genetic exchange of certain species.
- ▶ Restoring habitat quality.
- ▶ Protecting threatened, endangered, vulnerable, keystone or umbrella species.
- ▶ Maintaining or improving hydrological functions.
- ▶ Maintaining or improving environmental quality.
- ▶ Controlling erosion.
- ▶ Conserving valuable landscapes.
- ▶ Maintaining and improving biological resources (game, medicinal plants, genetic forest resources).

| Type of Land or Water Use | System or Sector | Main Products or Services | Extent (% area of network/length) | No. of Persons Directly Involved |
|--------------------------------|--|--|-----------------------------------|---|
| ▶ Arable farming/ horticulture | Small-scale, extensive; small-scale, intensive; large-scale, intensive | Wheat, rye, barley, maize, buckwheat, oats, sunflowers, cabbages, carrots, potatoes, peas, beets, apples, cherries, pears, plums | <10% | – |
| ▶ Animal husbandry/ rangelands | Traditional, extensive, sedentary; modern, intensive, market-oriented | Cows, sheep | <10% | – |
| ▶ Production forestry | Plantation forest; managed 'natural' forests (secondary forest) | – | 10-25% | Up to 100,000 |
| ▶ Fisheries | Artisanal, small-scale, inland; fish-farming | Carp | – | Up to 10,000 |
| ▶ Recreation/tourism | Mass recreation; ecotourism/nature observation; recreational hunting/fishing; cultural experiences | – | – | – |
| ▶ Habitation | – | – | – | Protected areas/core areas: approx. 1–10,000; buffer zones: approx. 10–50,000 |
| ▶ Cultural/religious values | – | 2 historic battle sites, 2 orthodox monasteries, several dozens of sacred springs | – | – |

CONFLICTS AND OPPORTUNITIES

Main Conflicts Between Biodiversity Conservation and Other Activities

- ▶ Forestry: Felling, forest plantations.
- ▶ Arable farming: Ploughing up meadows, draining wetlands.
- ▶ Recreation: Tramping down grassy cover, building country houses on sites with important natural communities.
- ▶ Animal husbandry: Overgrazing.
- ▶ Infrastructure: Building railways and roads on sites with important natural communities.

Main Opportunities for Mutually Strengthening Biodiversity Conservation and Other Activities

- ▶ Recreation/tourism: Native biodiversity strengthens the stability of natural communities and so makes possible the sustainable use of the recreational areas.
- ▶ Hunting: Native biodiversity strengthens the stability of the natural communities and so makes possible the sustainable use of the game resources.
- ▶ Arable farming: Field-margin hedgerows make agriculture more productive.

THE PLAN**Proposal/Plan/Programme**

- ▶ Type of plan:
 - Strategic plan.
 - 8 regional plans and 1 local plan.
 - Approx. 2000 area plans.
 - 1 management plan for national park.
- ▶ Reference: Dr. N.Sobolev (ed.), 1998, Ecological Network of the Central Russian plain, Moscow,. 80 pp.
- ▶ Responsible organisation:
 - The Laboratory for Applied Ecology.
 - Biodiversity Conservation Centre.
 - Ryazan Laboratory for Ecological Problems.
 - Tver Ecological Club.
 - Yaroslavl Laboratory 'Landscape'.
 - Vladimir branch of the All-Russian Society for Nature Conservation.
 - Movement for Protection of the Ugra River.
 - Ugra National Park.
 - Tula group Zaseka.
 - Obninsk Club 'Sledopyt'.
 - in co-ordination with regional conservation agencies.
- ▶ Plan comes into effect: 2001.
- ▶ Implementation complete: 2005.
- ▶ Implementing parties: Regional conservation agencies.
- ▶ Results achieved: Not yet known.

Data Collected

- ▶ Type of data: Ecological, socio-economic, institutional, cultural.
- ▶ Methods: Surveying and mapping, analytical methods, questionnaires.
- ▶ Data collected by: Research institutes, NGOs.

Monitoring and Evaluation Arrangements

- ▶ Plan monitored/evaluated by: Research institutes, NGOs.
- ▶ Monitoring/evaluation of results: Research institutes, NGOs.

Associated Research

- ▶ Assessment of the landscape structure based on the map analysis.
- ▶ Rapid assessment of the nativeness of biodiversity in the expected core areas and determining indicator species.
- ▶ Assessment of the buffer zones and ecological corridors as elements providing the stability of the core areas.
- ▶ Assessment of the state of the natural communities and other appropriate natural objects in the protected areas.

Educational/Communication Activities

- ▶ Activities carried out:
 - Course of territorial conservation in the Tver State University; optional course of territorial conservation in the Moscow State University (for volunteer Nature Protection Group); courses on regional conservation policy and practices in the Ryazan State Pedagogical University and the International Autonomous University of Ecology and Policies; courses on regional conservation for teachers in the Ryazan Institute of Education Development.

- In several districts school naturalist circles are involved in conservation activities.
- The first issue of the ‘Criteria and methods of establishment of the Ecological Networks’ was published in 1998 and re-edited in 1999. Plans to expand the scope of conservation courses and publish future issues of the ‘Criteria and methods of establishment of the Ecological Networks’.
- ▶ Activities aimed at: Students, local teachers and school children, officials of conservation agencies.

Legal Status of Network

- ▶ Status: The entire network has no legal status, but 26 natural sites have the legal status of federal protected areas and approx. 2000 natural sites, approx. 100 buffer zones and several tens of thousands of kilometres of water protection zones have the status of regional protected areas.
- ▶ Competent authority: Government conservation agencies.

Budget and Resources

- ▶ Funding:
 - Designing and developing the network: Approx. US\$60,000.
 - Establishing the network (e.g. land purchase): Approx. US\$20,000.
 - Managing the network: Approx. US\$10,000.
 - Monitoring and evaluation: Approx. US\$10,000.
- ▶ Available resources: Every zapovednik, national park and most of game preserves have staff.
- ▶ Increase in funding for biodiversity conservation stimulated by network: The development of the network encouraged an increase in funding for biodiversity conservation within the Central Russian plain from regional ecological funds (approx. USD\$50,000), federal budget (approx. USD\$10,000), foreign funds (approx. US\$100,000), GEF (approx. US\$120,000).

Relation to Other Networks

- ▶ Other known networks: In Russia: ECONET of the Volga-Ural region, including ECONET of the Orenburg region (first draft is developed); ECONET of the Bryansk, Orel, Kaluga adm. regions (first draft is developed); ECONET of the Volga–Viatka region (first draft should be prepared in early 2000, but the ECONET of the Nizhni Novgorod adm. region is already well developed), ECONET of the Lower Volga region (first draft should be prepared in early 2000), ECONET of the Central Chernozem zones, ECONET of the Mountain Altai (both first drafts should be prepared in early 2001), ECONET of the Novosibirsk adm. region (just developing), ECONET of the entire Volga basin, ECONET of the Northern Eurasia (only first drafts of conceptions are prepared).
- ▶ Benefits gained from other networks: We have very useful discussions on principles and methods of the establishment and supporting ECONET with leaders of the projects mentioned in the previous point.
- ▶ Benefits provided to other networks: The programme ‘Volga–Ural ECONET’ followed the example of the ‘Heart of Russia’. The ECONETs of the Volga–Viatka region and the Lower Volga region are being established using the experience of the ‘Heart of Russia’ and realised within the common project by regional and ‘Heart of Russia’ experts. The work on the ECONETs of the Northern Eurasia, of the Volga basin, of the Central Chernozem zone, of the Bryansk, Orel, Kaluga adm. regions benefits from the scientific expertise that was developed during realisation of the ‘Heart of Russia’.

Further Information

- ▶ Related initiatives: The ecological network should become the part of the Pan-European Ecological Network.
- ▶ Complementary activities: Supervision of forestry and agriculture; maintaining green belts along rivers and roads; development of ecologically based business (tourism, game).

32 Orenbourg, Russian Federation: Ecological Network of the Orenbourg Region

GENERAL INFORMATION ON THE NETWORK**Location of the Network**

Orenbourg Region, Russian Federation. Coordinates:

- ▶ 54° 50' 21' N, 50° 50' 30' N.
- ▶ 50° 50' 00' E, 62° 50' 30' E.

Responsible Organisation

Steppe Institute, Russian Academy of Sciences (Urals Branch), Orenbourg, Russian Federation.

Main Objectives of the Network

- ▶ To conserve biodiversity by maintaining landscape diversity. The network includes all landscape and administrative districts (1030 sites) and the entire diversity of sites of scientific and information value.
- ▶ The conservation of the culture and historic heritage sites.

Main Components of the Network

- ▶ Core areas: Category Ia, II, III, IV, V and VI sites.
- ▶ Corridors.
- ▶ Buffer zones.

Ecosystems Included in the Network

Characteristic and rare ecosystems, including semi-natural refuges.

Species Protected Through the Network

Species included in IUCN, Russian Federation and Orenbourg region Red Data Books, especially characteristic species for steppes, endemics and relicts.

- ▶ Plants:
 - Stipa sp.*
 - Trapa natans*
 - Juniperus sabina*
 - Orhis sp.*
 - Pinus silvestris*
 - Quercus robur*
 - Iris sp.*
 - Hedysarum sp.*
 - Tulipa schrenkii*

- ▶ Mammals: *Desmana moschata*
Vormela peregusna
Marmota bobac
Ochotona pusilla
- ▶ Birds: *Oxyura leucocephala*
Circus macrourus
Buteo rufinus
Aquila heliaca
Aquila rapax
Falco naumanni
Anthropoides virgo
Otis tarda
Tetrax tetrax
Himantopus himantopus
Numenius arquata
Bubo bubo
- ▶ Fish: *Acipenser ruthenus*
Salmo trutta morpha
Stenodus leucichthys
Thymallus thymallus
- ▶ Insects: *Saga pedo*
Bombus fragrans
Parnassius apollo

Natural Resources Exploited Within the Network

Oil and gas, non-ferrous metals, soil.

Relevant Government Policy

- ▶ The order of Orenbourg regional administration has been adopted. Zapovedniks have a federal status; natural monuments have a regional status.
- ▶ Project 'Green Book': first phase 1980, second phase 1997.

Status of Network Plan

Dimensions of the Network

- ▶ Area: Approx. 124,000 sq. km.
- ▶ North-south: 435 km.
- ▶ East-west: 750 km.
- ▶ Altitude range: 27–668 m.
- ▶ Areal percentage of core areas in relation to entire network: Less than 25%.

ENVIRONMENTAL CHARACTERISTICS

Main Environmental Units

- ▶ Climatic zone: Warm, temperate, rainy climate.
- ▶ Phyto-geographical/vegetation zones: Steppe (short grass).

Main Ecosystems Within the Network

- ▶ Forests.
- ▶ Grasslands.
- ▶ Mountain systems.
- ▶ Inland waters and wetlands.

Main Environmental Functions of the Network

- ▶ Maintaining or increasing the area of certain habitats.
- ▶ Maintaining or improving the dispersal, migration and/or genetic exchange of certain species.
- ▶ Restoring habitat quality.
- ▶ Protecting threatened, endangered, vulnerable, keystone or umbrella species.
- ▶ Maintaining or improving hydrological functions.
- ▶ Controlling erosion.
- ▶ Conserving valuable landscapes.
- ▶ Conserving aesthetic and cultural landscape values, including archaeological elements.

NATURAL RESOURCE EXPLOITATION

Main Types of Land and Water Use

| Type of Land or Water Use | System or Sector | Main Products or Services | Extent (% area of network/length) | No. of Persons Directly Involved |
|--------------------------------|-----------------------------------|--------------------------------|-----------------------------------|---|
| ▶ Arable farming/ horticulture | Large-scale, extensive | Wheat, sunflowers | >25% | Approx. 300,000 |
| ▶ Animal husbandry/ rangelands | Traditional, extensive, sedentary | Cows, sheep | >25% | – |
| ▶ Production forestry | Plantation forest | – | <10% | – |
| ▶ Fisheries | Fish-farming | Carp, Crucian carp | – | – |
| ▶ Industry/energy production | Thermal power | – | – | – |
| ▶ Recreation/tourism | Recreational hunting/ fishing | – | – | <50,000 |
| ▶ Habitation | – | – | – | Protected areas/ core areas: approx. 30,000; buffer zones approx. 2,000,000 |
| ▶ Infrastructure | – | – | Railways: 2100 km | – |
| ▶ Cultural/religious values | – | >2000 archaeological monuments | – | – |

CONFLICTS AND OPPORTUNITIES

Main Conflicts Between Biodiversity Conservation and Other Activities

- ▶ Mining industry (oil, gas, non-ferrous metals): Open-cast mining, pollution.
- ▶ Farming: Soil and vegetation degradation.

Main Opportunities for Mutually Strengthening Biodiversity Conservation and Other Activities

- ▶ Medium-scale grazing/stock-breeding: Grazing that imitates the impact of wild ungulates is favourable for steppe ecosystems.
- ▶ Afforestation: Restoring natural forests, stabilising sandy soils.

Proposal/Plan/Programme

- ▶ Type of plan: Regional plan.
- ▶ Responsible organisation: Steppe Institute, Urals Branch, Russian Academy of Sciences.
- ▶ Plan comes into effect: 1998.
- ▶ Implementation complete: 2000.
- ▶ Implementing parties: Steppe Institute.
- ▶ Results achieved: Not yet known.
- ▶ Plan revised: Not yet known.
- ▶ Plan evaluated: Not yet known.

Data Collected

- ▶ Type of data: Ecological.
- ▶ Methods: Surveying and mapping, GIS, aerial photography.

Associated Research

Focused on landscape, botanical, zoological, soil, geological, archaeological.

Educational/Communication Activities

Activities carried out: Steppe Institute and Orenbourg State University (OSU) postgraduates and undergraduates carry out the research mentioned above under the supervision of geographers from the Educational and Scientific Centre. This Centre has been established within the Steppe Institute as a branch of the Geography and Regional Studies Department of the OSU.

Legal Status of Network

Status: Independent initiative.

Relation to Other Networks

Benefits provided to other networks: The Orenbourg experience is used in Kamchatka, Samara, Lipetsk, Voronez, Volgograd and other regions as well as in Kazakhstan.

Further Information

- ▶ Related initiatives: Another biodiversity conservation measures that the Steppe Institute proposes to develop include the ecological network of the Northern Eurasia Steppe Zone, development of the ecological network near the frontier of Russia and Kazakhstan and the establishment of the ecological network within the Ural river basin (Russia and Kazakhstan).

33 Volga/Ural, Russian Federation: Volga-Ural ECONET

GENERAL INFORMATION ON THE NETWORK

Location of the Network

Bashkortostan Republic, Tatarstan Republic, Samara region and Orenburg region of the Russian Federation. Coordinates:

- ▶ 57° 30' N–51° 10' N.
- ▶ 47° 05' E–62° 15' E.

Responsible Organisation

'The Volga-Ural ECONET' Assistance Centre, Togliatti, Russian Federation.

Main Objectives of the Network

To conserve biodiversity.

Main Components of the Network

- ▶ Core areas:
 - Category Ib sites: 5 legally protected (680,000 ha total area), 2 in a project (70,000 ha total area).
 - Category II sites: 6 legally protected (420,000 ha total area), 5 in a project (210,000 ha total area).
 - Category III sites: 1780 legally protected, 450 in a project.
 - Category IV sites: 67 legally protected.
- ▶ Corridors (water protection zones, mountainous forests, field-margin forest belts).
- ▶ Buffer zones.

Ecosystems Included in the Network

Primary coniferous and mixed forests, steppe, wetlands.

Species Protected Through the Network

More than 300 species. Most important group are the large predators

Natural Resources Exploited Within the Network

Forest, minerals, game species.

Status of Network Plan

Non-governmental programme initiated in 1997.

Dimensions of the Network

- ▶ Area: 389,200 sq. km.
- ▶ North-south: 700 km.
- ▶ East-west: 1000 km.
- ▶ Altitude range: 43–1640 m.
- ▶ Longest distance between core areas: 50 km.
- ▶ Shortest distance between core areas: Adjacent.
- ▶ Areal percentage of core areas in relation to entire network: 25–50%.

Main Environmental Units

- ▶ Climatic zone: Cool, snow-forest climate.
- ▶ Phyto-geographical/vegetation zones: Mountain vegetation (3%), Boreal forests (taiga) (5%), non-Boreal coniferous forests (7%), mixed coniferous/deciduous forests of temperate latitudes (15 %), deciduous forests of temperate latitudes (35 %), steppe (short grass) (35%).
- ▶ River basins/marine areas: Volga, Ural, Tobol river basins.

Main Ecosystems Within the Network

- ▶ Forests:
 - Coniferous forests: 5%.
 - Mixed coniferous/deciduous forests: 35%.
 - Deciduous forests: 60%.
- ▶ Grasslands:
 - Steppe: 50%.
 - Meadows-steppe: 40%.
 - Meadows: 10 %.
- ▶ Mountain systems:
 - Mountain tundra: 20%.
 - Mountain meadows: 80%.
- ▶ Inland waters and wetlands:
 - Rivers and streams: 60%.
 - Lakes and reservoirs: 25%.
 - Wetlands: 15%.

Main Environmental Functions of the Network

- ▶ Maintaining or increasing the area of certain habitats.
- ▶ Maintaining or improving the dispersal, migration and/or genetic exchange of certain species.
- ▶ Restoring habitat quality.
- ▶ Protecting threatened, endangered, vulnerable, keystone or umbrella species (15–20 species).
- ▶ Maintaining or improving hydrological functions.
- ▶ Maintaining or improving environmental quality.
- ▶ Controlling erosion.
- ▶ Conserving valuable landscapes.
- ▶ Conserving cultural heritage.

NATURAL RESOURCE EXPLOITATION

| Type of Land or Water Use | Main Types of Land and Water Use | | | |
|--------------------------------|--|---------------------------|---|---|
| | System or Sector | Main Products or Services | Extent (% area of network/length) | No. of Persons Directly Involved |
| ▶ Arable farming/ horticulture | Small-scale, intensive | Cereals, grains | <10% | 10,000 |
| ▶ Animal husbandry/ rangelands | Traditional, extensive, sedentary | | Cows | >25% 50,000 |
| ▶ Production forestry | Managed 'natural' forests (secondary forest) | | – | >25% 50,000 |
| ▶ Fisheries | Artisanal, small-scale, inland | Freshwater fish | – | 500 |
| ▶ Industry/energy production | Hydropower | – | – | 500 |
| ▶ Recreation/tourism | Mass recreation, recreational hunting/ fishing, ecotourism/ nature observation | – | – | 1000 |
| ▶ Habitation | – | – | – | Protected areas: 1/sq. km; buffer zones: 2/sq. km |
| ▶ Infrastructure | – | – | Roads: 0.05 km/sq. km; railways: 0.005 km/sq. km | – |

CONFLICTS AND OPPORTUNITIES

Main Conflicts Between Biodiversity Conservation and Other Activities

- ▶ Forestry: Logging of primary forests.
- ▶ Agriculture: Transformation of grassland and forest ecosystems
- ▶ Communication infrastructure: Increasing human access.

THE PLAN

Proposal/Plan/Programme

- ▶ Type of plan: 1 strategic plan, 4 regional/local plans, 126 area plans.
- ▶ References:
 - Governmental agencies of the Bashkortostan Republic (Ministry of Forestry), Programme for the Development of a Protected Area System for Bashkortostan Republic, 1996, Ufa.
 - Laboratory of Natural Ecosystems, Ecological Framework for the Samara Region, 1995, Togliatti, Samara Region.
 - Biodiversity Conservation Centre, Steppe Programme, 1998, Moscow.
- ▶ Responsible organisations: Ministry of Forestry, Laboratory of Natural Ecosystems, Biodiversity Conservation Centre, local and regional authorities.
- ▶ Plans come into effect: 1995–1998.
- ▶ Implementation complete: 2000–2005.
- ▶ Implementing parties: Government agencies, research institutes and NGOs.
- ▶ Results achieved: 2003–2005.

Data Collected

- ▶ Type of data: Ecological, socio-economic, institutional.
- ▶ Methods: Surveying and mapping, analytical methods, GIS, field research.
- ▶ Data collected by: 'The Volga-Ural ECONET' Assistance Centre, Bashkortostan Academy of Science, Bashkortostan State University, Kazan State University, Samara State University, Steppe Institute, Laboratory of Natural Ecosystems, Biodiversity Conservation Centre, NGOs.

Monitoring and Evaluation Arrangements

- ▶ Plan monitored/evaluated by: 'The Volga-Ural ECONET' Assistance Centre, Laboratory of Natural Ecosystems, Biodiversity Conservation Centre.
- ▶ Monitoring/evaluation of results: 'The Volga-Ural ECONET' Assistance Centre, Bashkortostan Academy of Science, Samara State University, Steppe Institute, Laboratory of Natural Ecosystems, Biodiversity Conservation Centre.

Associated Research

Field research.

Educational/Communication Activities

Activities carried out: Articles in newspapers and magazines, television programmes.

Legal Status of Network

- ▶ Status: Approx. 30% of core areas are legally protected.
- ▶ Competent authority: Federal, regional and local government.
- ▶ Degree of adequacy of legislative framework: Not sufficient to ensure establishment of entire network.

Budget and Resources

- ▶ Funding:
 - Designing and developing the network: US\$150,000/300,000.
 - Establishing the network: US\$50,000/700,000.
 - Managing the network: US\$500,000/3,000,000.
 - Monitoring and evaluation: US\$50,000/150,000.
- ▶ Available resources: Every zapovednik and national park have staff.
- ▶ Increase in funding for biodiversity conservation stimulated by network: Approx. 50%.

Relation to Other Networks

Benefits gained from other networks: Methodological experience of ECONET of Nizhniy Novgorod region, ECONET of Moscow and nearby regions ('Heart of Russia' programme), ECONET of Novosibirsk region.

34 Ukraine: National Ecological Network

GENERAL INFORMATION ON THE NETWORK

Location of the Network

The territory of the Ukraine (approx. 37% of the entire territory).

Responsible Organisation

Ministry for Environmental Protection and Nuclear Safety, Central Board for National Nature Parks and Reserve Affairs, Kiev, Ukraine.

Main Objectives of the Network

Establishing a system of ecological stability and increasing the total amount of biodiversity.

Main Components of the Network

- ▶ Core areas including:
 - 15 nature reserves (Pryrodnyi Zapovidnyks): 113,658 ha, Category Ia and Ib sites.
 - 11 national nature parks: 583,334 ha, Category II sites.
 - 131 natural monuments of national importance: 5,524 ha, Category III sites.
 - 287 wildlife reserves of national importance (Zakaznik): 360,164 ha, Category IV sites.
 - 26 regional landscape parks: 399,907 ha, Category V sites.
 - 4 Biosphere Reserves and the Ukrainian Part of the Ukraine-Poland-Slovak Biosphere Reserve.
 - 22 Wetland sites of International Importance (Ramsar Sites).
- ▶ Corridors: Protected areas, historic sites, forest, wetlands, agricultural land.
- ▶ Buffer zones: Protected areas, historic sites, forest, wetlands, agricultural land.

Ecosystems Included in the Network

All natural systems (forest, steppe, mountain, rivers, seas etc) are the subject of conservation efforts.

Species Protected Through the Network

Priority is given to Red Data Book species of animals and plants as well those listed in List I and II of the Bern Convention and the European Red Data Lists. These include bison (553 individuals), bear (400 individuals), elk (6500 individuals) and dolphins.

Natural Resources Exploited Within the Network

Medical plants and grasses, grazing land, mineral waters, mushrooms, fish, game species.

Relevant Government Policy

Article 60 of the Law on the Nature Protected Fund of Ukraine requires the establishment of a natural territorial system of protection. The Plan for the Ukrainian Ecological Network was prepared in 1999. It is a state programme for the period 2000–2015.

Status of Network Plan

The ecological network programme was developed and approved by government and sent to the Supreme Soviet for endorsement.

Dimensions of the Network

- ▶ Area: 22,825,000 ha.
- ▶ North-south: 900 km.
- ▶ East-west: 1300 km.
- ▶ Altitude range: 0–2061 m.
- ▶ Longest distance between core areas: 450 km.
- ▶ Shortest distance between core areas: 110 km.
- ▶ Areal percentage of core areas in relation to entire network: Approx. 24% (in 2015).

ENVIRONMENTAL CHARACTERISTICS

Main Environmental Units

- ▶ Climatic zone: Warm, temperate, rainy climate.
- ▶ Phyto-geographical/vegetation zones: Mountain vegetation, non-Boreal coniferous forests, mixed coniferous/deciduous forests of temperate latitudes, deciduous forests of temperate latitudes, Mediterranean shrub formations, steppe (short grass), savanna and woodlands.
- ▶ River basins/marine areas: Marine areas: the Black and Azov Seas; river basins: Dnieper, Danube, Dniester, South and West Bougs, Siverskyi Donetsk, Prypyat', Desna.

Main Ecosystems Within the Network

- ▶ Forests: 43%.
- ▶ Grasslands: 37%.
- ▶ Mountain systems: 2%.
- ▶ Inland waters and wetlands: 15%.
- ▶ Coastal ecosystems: 1%.
- ▶ Pelagic (marine) ecosystems: 2%.

Main Environmental Functions of the Network

- ▶ Maintaining or increasing the area of certain habitats.
- ▶ Maintaining or improving the dispersal, migration and/or genetic exchange of certain species.
- ▶ Restoring habitat quality.
- ▶ Protecting threatened, endangered, vulnerable, keystone or umbrella species.
- ▶ Maintaining or improving hydrological functions.
- ▶ Maintaining or improving environmental quality.
- ▶ Controlling erosion.
- ▶ Conserving valuable landscapes.
- ▶ Maintaining biocenosis on radioactive-contaminated land.

The network also provides interconnectivity with adjacent transboundary areas.

NATURAL RESOURCE EXPLOITATION

| Main Types of Land and Water Use | | | | |
|---|---|-----------------------------------|---|--|
| Type of Land or Water Use | System or Sector | Main Products or Services | Extent (% area of network/length) | No. of Persons Directly Involved |
| ▶ Arable farming/ horticulture | Small-scale, extensive; small-scale, intensive; large-scale, extensive; collective large-scale, intensive | Cereals, maize, sun-flowers, beet | <10% | 200,000 |
| ▶ Animal husbandry/ rangelands | Traditional, extensive (semi-) nomadic; modern, intensive, market-oriented | Cattle, pigs, sheep | 38% | 30,000 |
| ▶ Production forestry | Plantation forest; managed 'natural' forests (secondary forest); primary forests not yet exploited | – | 20% | 110,000 |
| ▶ Fisheries | Industrial, large-scale, inland; industrial, large-scale, coastal; fish-farming | – | – | 30,000 |
| ▶ Industry/energy production | Hydropower, renewable energy | – | – | 2000 |
| ▶ Recreation/tourism | Mass recreation; ecotourism/nature observation; recreational hunting/fishing; cultural experiences | – | – | 500,000 |
| ▶ Habitation | – | – | – | Protected areas or core areas: 8000; buffer zones: 1,000,000 |
| ▶ Infrastructure | – | – | Roads: 150,000 km; railways: 2000 km; canals: 1000 km | – |
| ▶ Cultural/religious values | – | Values related to Orthodox church | – | – |

CONFLICTS AND OPPORTUNITIES

Main Conflicts Between Biodiversity Conservation and Other Activities

- ▶ Water management (irrigation, drainage, reservoir construction): loss of valuable meadow and wetlands.
- ▶ Fisheries: Overfishing of native fish species.
- ▶ Road construction: Fragmentation.

Main Opportunities for Mutually Strengthening Biodiversity Conservation and Other Activities

- ▶ Forestry: Increasing forest biodiversity.
- ▶ Reduction in area of arable land: Increasing grassland biodiversity.

Proposal/Plan/Programme

- ▶ Type of plan: Legally binding strategic plan.
- ▶ Reference: Cabinet of Ministries, 1999, The Programme for the Establishment of the National Ecological Network of Ukraine for 2000–2015.
- ▶ Responsible organisation: Ministry for Environmental Protection and Nuclear Safety, Central Board for National Nature Parks and Reserve Affairs.
- ▶ Plan comes into effect: 2001.
- ▶ Implementation complete: 2015.
- ▶ Implementing parties: Government agencies.
- ▶ Results achieved: Not yet known.
- ▶ Plan revised: Not yet known.
- ▶ Plan evaluated: 2005.

Data Collected

- ▶ Type of data: Ecological, socio-economic, institutional, cultural.
- ▶ Methods: Surveying and mapping, analytical methods, GIS, remote sensing.
- ▶ Data collected by: Ministry for Environmental Protection and Nuclear Safety/Central Board for National Nature Parks and Reserve Affairs (including local departments), research institutions, scientific divisions of protected area agencies.

Monitoring and Evaluation Arrangements

- ▶ Plan monitored/evaluated by: Joint special commission and independent experts.
- ▶ Monitoring/evaluation of results: Scientific experts and NGOs.

Associated Research

Ecological research, monitoring.

Educational/Communication Activities

Activities carried out: Ecological education of all levels, information on establishment of network has been disseminated through Ukrainian magazine Living Ukraine from 1998 year (available in English).

Legal Status of Network

- ▶ Status: Partial status was provided through Article 60 of the Law on Environmental Protection (1961) and the Law on the Natural Reserve Fund of Ukraine (1992).
- ▶ Degree of adequacy of legislative framework:

Budget and Resources

Funding:

- ▶ Designing and developing the network: UAH 27,000,000.
- ▶ Managing the network: UAH 20,000,000/year.
- ▶ Monitoring and evaluation: UAH 400,000/year.

Relation to Other Networks

Other known networks: Pan-European Ecological Network, Emerald Network.

Further Information

Related initiatives: Ukraine is participating in the development of Biosphere Reserves and Ramsar wetlands, collecting data on the network of Biogenetic Reserves (Council of Europe) and World Heritage sites, and is commencing work on creating the Emerald Network and the Pan-European Ecological Network.

35 California, United States: Conception Coast Project

GENERAL INFORMATION ON THE NETWORK**Location of the Network**

The watersheds of the Cuyama/Sisquoc/Santa Maria, the Santa Ynez, the Santa Clara and the Ventura rivers, the Channel Islands, the Santa Barbara Channel and the coastal waters on the south-central coast of California.

Responsible Organisations

Conception Coast Project.

Main Objectives of the Network

To protect and restore the ecological integrity of the Conception Coast region through infusing conservation science into the community through communication and cooperation and facilitating implementation of a long-term biodiversity protection strategy. This will involve:

- ▶ Restoring large carnivores, ungulates and other focal species native to the region.
- ▶ Maintaining viable populations of all native species in natural patterns of abundance and distribution.
- ▶ Representing and protecting in a system of buffered core reserves all native ecosystem types and stages of succession across their natural range of variation.
- ▶ Maintaining ecological and evolutionary processes.
- ▶ Protecting and restoring functional habitat connectivity.
- ▶ Eliminating or controlling exotic species.
- ▶ Accommodating human land use and occupancy consistent with these requirements.

Main Components of the Network

- ▶ Core areas.
- ▶ Corridors.
- ▶ Buffer zones.

Ecosystems Included in the Network

River basins and coastal ecosystems.

Species Protected Through the Network

Focal species and other rare species.

Natural Resources Exploited Within the Network

Not specified.

Relevant Government Policy

Not specified.

Status of Network Plan

The CCP has its roots in The Wildlands Project (TWP). TWP is a visionary organisation whose mission is to protect and restore the natural heritage of North America through the establishment of a connected system of wildlands reserves. TWP believes that preserving creation is our ethical and moral responsibility to future generations and to all living things, and that healthy ecosystems play a critical role in maintaining healthy human communities. The strategy of TWP is to work in cooperation with independent grassroots organizations throughout the continent to develop regional wilderness proposals for each bioregion based on the principles of conservation biology. As regional proposals are developed, TWP will stitch together a continental vision. After a TWP presentation in Santa Barbara in the fall of 1995, a group of activists, scientists, land use managers and academics dedicated to protection of biodiversity convened to develop a wilderness protection proposal for the region. This group evolved into the Conception Coast Project. The CCP is thus working towards a regional plan that will be connected to a continent-wide system of such a plan.

36 Vermont, United States: Maine Wildlands Reserve Network

GENERAL INFORMATION ON THE NETWORK**Location of the Network**

The state of Maine, although attention is being given to potential linkages to neighbouring states.

Responsible Organisation

Greater Laurentian Wildlands Project, South Burlington, Vermont, USA.

Main Objectives of the Network

- ▶ To protect and restore the native biodiversity and ecological integrity of the region. This includes the recovery of all native species, especially large, wide-ranging carnivores.
- ▶ To protect and restore future opportunities for outdoor recreation and traditional uses such as hunting and fishing.

Main Components of the Network

- ▶ Core areas (including all IUCN protected area categories and 4 marine protected areas).
- ▶ Corridors.
- ▶ Buffer zones.
- ▶ Restoration zones.

Ecosystems Included in the Network

All native ecosystems. Interior forest habitat is probably considered the biggest priority.

Species Protected Through the Network

- ▶ Mammals:
 - American marten *Martes americana*
 - Lynx *Lynx canadensis*
 - Eastern timber wolf *Canis lupus lycaon*
 - Eastern cougar *Felis concolor*
 - River otter *Lutra canadensis*
- ▶ Birds:
 - Northern goshawk *Accipiter gentilis*
 - Red-shouldered hawk *Buteo lineatus*
 - Black tern *Chlidonias niger*
 - Common loon *Gavia immer*
 - Bicknell's thrush *Catharus bicknelli*
- ▶ Fish:
 - Atlantic salmon *Salmo salar*

Natural Resources Exploited Within the Network

Timber, rivers (hydro-electric), minerals/rock.

Relevant Government Policy

None.

Status of Network Plan

In preparation.

Dimensions of the Network

- ▶ Area: 41,000 sq. km (excluding potential buffer zones).
- ▶ North-south: 490 km.
- ▶ East-west: 320 km.
- ▶ Altitude range: 0–1606 m.
- ▶ Longest distance between core areas: 28 km.
- ▶ Shortest distance between core areas: 2.2 km.
- ▶ Areal percentage of core areas in relation to entire network: Greater than 50%.

ENVIRONMENTAL CHARACTERISTICS**Main Environmental Units**

- ▶ Climatic zone: Cool, snow-forest climate (cold, snowy winters and warm, humid summers).
- ▶ Phyto-geographical/vegetation zones: Mountain vegetation, tundra, Boreal forests (taiga), non-Boreal coniferous forests, mixed coniferous/deciduous forests of temperate latitudes.
- ▶ River basins/marine areas: Multiple river basins, marine area: Gulf of Maine.

Main Ecosystems Within the Network

- ▶ Forests: Approx. 70%.
- ▶ Grasslands: Approx. 5%.
- ▶ Mountain systems: Approx. 5%.
- ▶ Inland waters and wetlands: Approx. 15%.
- ▶ Coastal ecosystems: Approx. 5%.

Main Environmental Functions of the Network

- ▶ Maintaining or increasing the area of certain habitats.
- ▶ Maintaining or improving the dispersal, migration and/or genetic exchange of certain species.
- ▶ Restoring habitat quality.
- ▶ Protecting threatened, endangered, vulnerable, keystone or umbrella species.
- ▶ Maintaining or improving hydrological functions.
- ▶ Conserving valuable landscapes.

NATURAL RESOURCE EXPLOITATION

Main Types of Land and Water Use

| Type of Land or Water Use | System or Sector | Main Products or Services | Extent (% area of network/length) | No. of Persons Directly Involved |
|--------------------------------|---|--|-----------------------------------|---|
| ▶ Arable farming/ horticulture | Small-scale, intensive | Potatoes, blueberries | <10% | – |
| ▶ Animal husbandry/ rangelands | – | – | <10% | – |
| ▶ Production forestry | Managed 'natural' forests (secondary forest) | – | >25% | – |
| ▶ Fisheries | Industrial, large-scale, coastal; fish-farming | Salmon, clams, trout, mussels, oysters | – | – |
| ▶ Industry/energy production | Hydropower | – | – | – |
| ▶ Recreation/tourism | Ecotourism/ nature observation; recreational hunting/fishing; snow-mobiling | – | – | – |
| ▶ Habitation | – | – | – | Protected areas/ core areas: <1/sq. km; buffer zones: <1/sq. km |
| ▶ Infrastructure | – | – | – | – |
| ▶ Cultural/religious values | – | – | – | – |

CONFLICTS AND OPPORTUNITIES

Main Conflicts Between Biodiversity Conservation and Other Activities

- ▶ Private-property proponents: Opposition to any regulation or land purchases.
- ▶ Timber base: Loss of 'working forest to protected areas'.

Main Opportunities for Mutually Strengthening Biodiversity Conservation and Other Activities

- ▶ Communities: Loss of timber-based economy may result in more ecologically based industry.
- ▶ Recreation: Possibilities for increased ecotourism.

THE PLAN

Proposal/Plan/Programme

- ▶ Type of plan: Independent strategic, regional plan.
- ▶ Reference: Maine Wildlands Reserve Network: A Science Informed Conservation Plan for Maine (draft), July 1999.
- ▶ Responsible organisation: Greater Laurentian Wildlands Project.
- ▶ Plan comes into effect: Not yet known (public release of plan 2000).
- ▶ Implementation complete: Not before 2010.
- ▶ Implementing parties: Multiple parties.
- ▶ Results achieved: Not yet known.
- ▶ Plan revised: Continually.
- ▶ Plan evaluated: Group of independent reviewers.

Data Collected

- ▶ Type of data: Ecological, socio-economic, institutional, cultural.
- ▶ Methods: Surveying and mapping, analytical methods, GIS, remote sensing.
- ▶ Data collected by: Greater Laurentian Wildlands Project.

Associated Research

Various.

Educational/Communication Activities

Planned following publication of plan.

Legal Status of Network

Status: No legal status.

Budget and Resources

- ▶ Funding: Designing and developing network US\$50,000.
- ▶ Available resources: 2 persons, GIS equipment.

Relation to Other Networks

- ▶ Other known networks: A2A (Algonquin to Adirondacks Conservation Initiative).
- ▶ Benefits gained from other networks: The experience gained through other networks associated with The Wildlands Project.
- ▶ Benefits provided to other networks: Shared information with other Wildlands Project cooperators.

Further Information

- ▶ Related initiatives: Part of a planned reserve network for the entire Greater Laurentian Region (New York, New England, Eastern Canada) which will eventually connect with other Wildlands Project networks to the South and West.
- ▶ Additional remarks: The network we propose is very large scale, therefore, answers provided are estimates only. Further, the network will not be implemented under one programme or campaign. We are currently fundraising to contract a socio-economic study of our reserve network design for Maine.

GENERAL INFORMATION ON THE NETWORK**Location of the Network**

The proposed corridor is located in the northwestern part of the Cauca department and the southwestern part of the Valle department found in the western Andean cordillera. The Andean part of the corridor stretches between Tambito (Cauca) to the south and Aguaclara (Valle) to the north, extending attitudinally from the peaks of the cordillera, westward to the Pacific Ocean. The Naya river flows from the peaks of Colombia's Andean western cordillera to the lowlands of the Pacific region and forms the backbone of the Naya conservation corridor. Coordinates:

- ▶ North 3° 40' N–76° 55' W (Aguaclara), South 2° 30' N–77° 00' W (Tambito).
- ▶ West 77° 32' W–3° 11' N (Boca del Naya), East 76° 35' W–3° 20' N (Melendez).

Responsible Organisations

Pro-Selva Foundation, Popayan, Colombia; Conservation International–Colombia, Bogota, Colombia.

Main Objectives of the Network

- ▶ Conserve biological diversity and ensure its sustainable use.
- ▶ Provide safe passage for the migration of species and genes between the Tambito Private Reserve, the Farallones and Munchique national parks.
- ▶ Provide globally significant benefits from the sequestration of carbon dioxide and the preservation of species with pharmacological and industrial properties.
- ▶ Enhance the community and cultural cohesion of indigenous and Afro-Colombian groups inhabiting the Naya river watershed.
- ▶ Provide environmentally sound development opportunities for local communities.

Main Components of the Network

- ▶ Core areas: Category II sites. The proposed Naya Conservation Corridor includes the University of Cauca land concession (located in the Naya river watershed) and three existing protected areas (the Munchique National Park, Farallones de Cali National Park and the Tambito Private Reserve) which would bring the protected land total to 420,000 ha.
- ▶ Corridors.
- ▶ Buffer zones.

Ecosystems Included in the Network

- ▶ The University of Cauca land concession extends attitudinally from the peaks of Colombia's Andean western cordillera westward to the Pacific Ocean and encompasses the full range of Chocoan and Andean ecosystems. The Chocoan ecosystems include the Mangrove, Natal, and Guandal forests and the Andean ecosystems are dominated by the Basal, Sub-Andean, Andean and High-Andean forests (i.e. cloud forest). As the altitude increases the trees and their leaves get smaller and epiphytes become more abundant. Then, at altitudes above 3000 m the trees of the High-Andean forests are replaced by an endemic and relatively homogenous ecosystem called the Paramo. The Naya River has its source in the Paramo at 4300 m and this ecosystem regulates the amount of water that is used by local communities living in the lowlands. It should be noted that the High-Andean forest is extremely important for the water balance, productivity and climatic behaviour of the region.

- ▶ WWF ecoregions: Choco/Darien moist forests (39), Northwestern Andean montane forests (41).

Species Protected Through the Network

- ▶ Animals
 - Tremarctos ornatus* (flagship species)
 - Panthera onca* (flagship species)
 - Puma concolor* (flagship species)
 - Felis pardalis*
 - Pandion haliaetus*
 - Felis yagouaroundi*
 - Felis wiedii*
 - Tinamus tao*
 - Spizaetus ornatus*
 - Oroaetus isidori*
 - Falco peregrinus*
 - Falco deiroleucus*
 - Rupicola peruviana*
 - Cephalopterus penduliger*
 - Lutra longicaudis*
 - Cerdocyon thous*
- ▶ Plants
 - Cedrela odorata*
 - Juglans neotropica*
 - Podocarpus oleifolius*
 - Podocarpus montana*
 - Swietenia macrofila*
 - Aniba perutilis*
 - Gorgoglossum* spp.
 - Oreomunnea munchiquensis*
 - Ornitocephalus biscoglossus*

Natural Resources Exploited Within the Network

Timber, fish, gold mining.

Relevant Government Policy

The Naya corridor itself is not included in government policy. However, the two national parks (Farallones and Munchique) that the corridor will connect are part of the national park system of Colombia.

Status of Network Plan

A pre-proposal for the design of a management plan for the Naya Conservation Corridor was developed. Based on this pre-proposal, local communities, the ProSelva Foundation, Cauca University and Conservation International will develop the final draft of a proposal for the design of a management plan, with completion due in 2000.

Dimensions of the Network

- ▶ Area: 420,000 ha.
- ▶ Altitude range: 0–4300 m.
- ▶ Longest distance between core areas: Approx. 30 km.
- ▶ Shortest distance between core areas: Approx. 24 km.
- ▶ Areal percentage of core areas in relation to entire network: 25–50%.

ENVIRONMENTAL CHARACTERISTICS

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Main Environmental Units

- ▶ Climatic zone: Tropical, rainy climate.
- ▶ Phyto-geographical/vegetation zones: Mountain vegetation, tropical rainforests.
- ▶ River basin: Naya river.

Main Ecosystems Within the Network

Forests: Approx 1.5% of total area (tropical rainforests and Andean forests).

Main Environmental Functions of the Network

- ▶ Maintaining or increasing the area of certain habitats.
- ▶ Maintaining or improving the dispersal, migration and/or genetic exchange of certain species.
- ▶ Restoring habitat quality.
- ▶ Protecting threatened, endangered, vulnerable, keystone or umbrella species.
- ▶ Maintaining or improving hydrological functions.

NATURAL RESOURCE EXPLOITATION

Main Types of Land and Water Use

| Type of Land or Water Use | System or Sector | Main Products or Services | Extent (% area of network/length) | No. of Persons Directly Involved |
|--------------------------------|---|--|-----------------------------------|---|
| ▶ Arable farming/ horticulture | Small-scale, extensive; collective agricultural practices | Subsistence crops: rice, bananas, plantain, chontaduro, sugar cane, tree fruits, papachina, coconuts | 10-25% | Approx. 10,000 |
| ▶ Animal husbandry/ rangelands | Traditional, semi-extensive | Cows, pigs, chickens | <10% | Approx. 8,000 |
| ▶ Production forestry | Managed 'natural' forests – (secondary forest); primary forests not yet exploited; managed mangrove | | 10-25% | Approx. 10,000 |
| ▶ Fisheries | Artisanal, small-scale, inland; artisanal, small-scale, coastal | Sardines | – | Approx. 10,000 |
| ▶ Industry/energy production | | | – | |
| ▶ Recreation/tourism | Ecotourism/ nature observation | | – | |
| ▶ Habitation | – | – | – | Protected areas or core areas approx. 2,300; buffer zones approx. 6,700 |
| ▶ Infrastructure | – | – | – | – |
| ▶ Cultural/religious values | – | – | – | – |

Productive activities are carried out on a seasonal basis. This means that mining activities are carried out in the dry season and fishing and agriculture are practised during the wet season. Afro-Colombian and indigenous communities have carried out these and other practices in a sustainable way. This has contributed to the conservation of the region's biodiversity.

CONFLICTS AND OPPORTUNITIES

Main Conflicts Between Biodiversity Conservation and Other Activities

- ▶ Forestry: Deforestation.
- ▶ Illegal crops: Deforestation, pollution, violence.
- ▶ Mining: Pollution.

Main Opportunities for Mutually Strengthening Biodiversity

Conservation and Other Activities

- ▶ Local community council: Design and implementation of the management plan for the corridor.
- ▶ Cauca University: Design and implementation of the management plan for the corridor.
- ▶ National Parks Unit: Design and implementation of the management plan for the corridor.

THE PLAN

Proposal/Plan/Programme

- ▶ Type of plan: Independent initiative.
- ▶ Reference: Designing and Implementing A Community-Based Management and Monitoring Plan for the Proposed Naya Conservation Corridor.
- ▶ Responsible organisations: Pro-Selva Foundation, Conservation International and Cauca University.
- ▶ Plan comes into effect: 2000.
- ▶ Implementation complete: Not yet known.
- ▶ Implementing parties: Pro-Selva Foundation, Conservation International, Cauca University, Naya Community Council.
- ▶ Results achieved: Not yet known.
- ▶ Plan revised: Not yet known.
- ▶ Plan evaluated: Not yet known.

Data Collected

- ▶ Type of data: Ecological, socio-economic, institutional, cultural.
- ▶ Methods: Surveying and mapping, analytical methods, GIS, remote sensing, workshops.
- ▶ Data collected by: Pro-Selva Foundation.

Legal Status of Network

Status: No legal status.

38 Australia: National Reserve System Program

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GENERAL INFORMATION ON THE NETWORK

Location of the Network

The territory of Australia.

Responsible Organisation

National Reserve System Program, Environment Australia, Canberra, Australia.

Main Objectives of the Network

The National Reserve System Program (NRSP) has a national objective to work with all levels of government, industry and the community to:

- ▶ Establish and manage new ecologically significant protected areas for addition to Australia's terrestrial National Reserve System.
- ▶ Provide incentives for Indigenous people to participate in the National Reserve System through voluntary declaration of protected areas on their lands and support for greater involvement of indigenous people in the management of existing statutory protected areas.
- ▶ Provide incentives for landholders (both private landholders and leaseholders) to strategically enhance the National Reserve System.
- ▶ Develop and implement best practice standards for the management of Australia's National Reserve System.

Other objective:

- ▶ To develop a comprehensive, adequate and representative reserve system of all 'ecosystems' as defined within each State and Territory.

NB: the 'network' is defined as the terrestrial areas of Australia that are potentially available for inclusion in a comprehensive, adequate and representative reserve system and managed equivalent to Categories Ia–IV of IUCN's protected area system.

Main Components of the Network

- ▶ Core areas: The NRSP requires all funded land acquisitions or covenant agreements to comply with one of the IUCN protected area categories. Wetlands and Biosphere reserves are often a component of lands acquired.
- ▶ Corridors.

Ecosystems Included in the Network

The NRSP utilises the Interim Biogeographic Regionalisation of Australia as its planning framework to create a National Reserve System. The regions have been prioritised and efforts are made to concentrate funding on these areas. However, the objective is to develop a comprehensive, adequate and representative reserve system of all ecosystems.

Species Protected Through the Network

All Australian flora and fauna/vegetation communities, associations etc. as per State and Territory scale mapping/description.

Natural Resources Exploited Within the Network

Arable land, grassland, forests, minerals.

Relevant Government Policy

Australia Natural Heritage Trust Act, Convention on Biodiversity.

Status of Network Plan

The NRSP operates under three plans:

- ▶ The Natural Heritage Trust Partnership Agreements 1997.
- ▶ The National Reserve System Operation Plan 1999.
- ▶ The Scientific Guidelines for Developing a National Reserve System 1999.

Dimensions of the Network

- ▶ Area: Encompasses continental Australia.
- ▶ Altitude range: 0–2229 m.
- ▶ Areal percentage of core areas in relation to entire network: Less than 25%.

ENVIRONMENTAL CHARACTERISTICS**Main Environmental Units**

- ▶ Climatic zones: Tropical, rainy climate; dry climate; warm, temperate, rainy climate; cool, snow-forest climate.
- ▶ Phyto-geographical/vegetation zones: Mountain vegetation, mixed coniferous/deciduous forests of temperate latitudes, deciduous forests of temperate latitudes, Mediterranean shrub formations, steppe (short grass), savanna and woodlands, tropical rainforests, monsoon forests (deciduous), dry tropical forests (semi-deciduous), subtropical forests, desert vegetation, dry and wet sclerophyll forest, eucalypt woodland, mallee.

Main Ecosystems Within the Network

- ▶ Forests.
- ▶ Grasslands.
- ▶ Mountain systems.
- ▶ Inland waters and wetlands.
- ▶ Coastal ecosystems.

Main Environmental Functions of the Network

- ▶ Maintaining or increasing the area of certain habitats.
- ▶ Maintaining or improving the dispersal, migration and/or genetic exchange of certain species.
- ▶ Protecting threatened, endangered, vulnerable, keystone or umbrella species.

| Main Types of Land and Water Use | | | | |
|---|---|--|--|---|
| Type of Land or Water Use | System or Sector | Main Products or Services | Extent (% area of network/length) | No. of Persons Directly Involved |
| ▶ Arable farming/ horticulture | Small-scale, extensive; small-scale, intensive; large-scale, extensive; large-scale, intensive | Grain (wheat, sorghum, canola etc.), legumes (beans, peas, lucerne etc.), cotton | >25% | – |
| ▶ Animal husbandry/ rangelands | Modern, intensive, market oriented; extensive commercial grazing/pastoral | Sheep, cattle | >25% | – |
| ▶ Production forestry | Plantation forest, managed 'natural' forests (secondary forest), primary forests not yet exploited, plantation pine and other non-native forest | – | 10-25% | – |
| ▶ Industry/energy production | Hydropower, nuclear power, coal, minerals, precious metals | – | – | – |
| ▶ Recreation/tourism | Mass recreation, ecotourism/nature observation, recreational hunting/ fishing, cultural experiences | – | – | – |
| ▶ Habitation | – | – | – | – |
| ▶ Infrastructure | – | – | – | – |
| ▶ Cultural/religious values | Australia contains an extensive range of cultural and historic sites. These are catalogued by the Australian Heritage Commission (Register of the National Estate Database) | – | – | – |

CONFLICTS AND OPPORTUNITIES

Main Conflicts Between Biodiversity Conservation and Other Activities

- ▶ Agriculture/pastoralism: Land resources (erosion, salinisation, habitat destruction, species loss).
- ▶ Mining: Land resources (water quality, habitat destruction).
- ▶ Urbanisation: Land values/space (water and environmental quality, habitat destruction).

Main Opportunities for Mutually Strengthening Biodiversity Conservation and Other Activities

- ▶ Agriculture/pastoralism: Protecting remnant vegetation.
- ▶ Forestry: Expand native forest.
- ▶ Mining: Protecting remnant vegetation.

THE PLAN

Proposal/Plan/Programme

- ▶ Type of plan: Strategic (NRSP), regional and local plans (prepared by State and Territory government agencies), management plans (prepared by State, Territory and NGOs).
- ▶ Reference: National Reserve System Program Strategic Plan, July 1999; Environment Australia, Canberra.
- ▶ Responsible organisation: Environment Australia.
- ▶ Plan comes into effect: 1997.
- ▶ Implementation complete: 2002.
- ▶ Implementing parties: Environment Australia.
- ▶ Results achieved: Not yet known.
- ▶ Plan revised: Annually.
- ▶ Plan evaluated: 1999.

Data Collected

- ▶ Type of data: Ecological (flora and fauna survey, biological inventory, biodiversity/vegetation analysis/assessment – determination of gaps in State/Territory reserve systems).
- ▶ Methods: Surveying and mapping, analytical methods, GIS, remote sensing, verbal communication/expert advice.
- ▶ Data collected by: State and Territory government agencies.

Monitoring and Evaluation Arrangements

- ▶ Plan monitored/evaluated by: NRSP.
- ▶ Monitoring/evaluation of results: NRSP, State and Territory lead agency.

Associated Research

- ▶ Regional planning, bioregional assessments.

Educational/Communication Activities

- ▶ Activities carried out: Public education brochure on the programme's function, press releases, journal articles.
- ▶ Activities directed at: Broader community knowledge and implementation of the programme.

Legal Status of Network

- ▶ Status: All acquisitions funded through the NRSP require legal gazettal of the land under State/Territory legislation as a protected area and identified IUCN Category I–IV.
- ▶ Competent authority: States and Territories.
- ▶ Degree of adequacy of legislative framework: Adequate.

Budget and Resources

- ▶ Funding: AUS\$85 million (over 6 years).
- ▶ Available resources: NRSP has 7 staff members, standard office facilities and GIS software.
- ▶ Increase in funding for biodiversity conservation stimulated by network: State, Territories and NGO are required to contribute AUS\$1.00 for every AUS\$2.00 Commonwealth contribution, funding through the programme has also established other conservation networks (e.g. the Grassy White Box Protected Area Network).

Relation to Other Networks

- ▶ Other known networks: Grassy Whitebox Woodland Protected Area Network, Protected Areas on Private Land (Tasmania), regional plan for the Southern Mallee.
- ▶ Benefits provided to other networks: Where new networks are established the NRSP assists in establishing relationships between stakeholders and also provides technical assistance where possible.

Further Information

- ▶ Related initiatives: The NRSP is part of the Natural Heritage Trust which also contains other programmes aiming to enhance Australia's biodiversity protection (Bushcare, Rivercare, Landcare, etc.).
- ▶ Complementary activities:
 - The NRSP is being developed in cooperation with State and Territory partnerships with the lead conservation agencies. The agencies analyse data to determine gaps in the reserve system within their jurisdiction and evaluate their planning accordingly.
 - Establishment of perpetual funds, e.g. revolving funds that State agencies or major listed non-government conservation groups can use to buy and on-sell land acquired for conservation purposes.

APPENDIX 2. Resolution 1.38 of the World Conservation Congress, Montreal, 1996: Ecological Networks and Corridors of Natural and Semi-Natural Areas

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Having regard to the shared responsibility in conserving the Earth's biological diversity;

Acknowledging that governments, non-governmental organizations and individuals are making important efforts to conserve this biological diversity but that it is still under serious threat from the continuing loss and fragmentation of habitats and the deterioration in environmental quality;

Reaffirming the need for government policies to be sustainable and to be developed and implemented on the basis of collaboration and a common understanding of problems, needs and priorities;

Recognizing that there is a growing body of experience being gained around the world by farmers, foresters, indigenous groups, public agencies, and other interested stake-holders, who are seeking institutional mechanisms that will encourage, enable and empower them cooperatively and voluntarily to manage their bioregions in ways that ensure their livelihoods and lifestyles, while building stewardship for the bioregion's biodiversity and protected areas;

Reaffirming the importance of incorporating coherent ecological objectives into all policies, and particularly those in the fields of nature conservation, environmental protection, agriculture and land-use planning;

Recognizing the scientific underpinning from the field of conservation biology that emphasizes the importance of large bioregions in which national parks and other protected areas are linked by broad connecting habitat or conservation corridors to accommodate climate change impacts and wide-ranging species;

Noting also that parts of or entire mountain ranges still offer good opportunities to create wildland bioregional-scale corridors, extending over hundreds or even thousands of kilometers, such as the southeastern Australia Great Dividing Range, the Rocky Mountains from Yellowstone to Yukon, and the Andean Bear corridor from Venezuela to Ecuador;

Recognizing that ecological networks to conserve, restore and complement valuable protected and non-protected natural and semi-natural habitats are being developed in many countries around the world as a means of achieving these objectives, such as the Pan-European Ecological Network (EECONET), the Central American Biological Corridor, the Western Hemisphere Shorebird Reserve Network, the East Asian-Australian Shorebird Reserve Network and the network of flyway areas under the African-Eurasian Waterbird Agreement;

Noting that these ecological networks often contain core areas, buffer zones, corridors and rehabilitation areas, are adapted to the needs of many kinds of ecosystems, habitats and species, are applied at different scales, and can accommodate compatible sustainable land uses and provide various forms of protection;

The World Conservation Congress at its 1st Session in Montreal, Canada,
14-23 October 1996:

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1. Calls upon all IUCN members to further the development of ecological networks at national, regional and intercontinental level as a means of strengthening the integrity and resilience of the world's biological diversity;
2. Requests the Director General, within available resources:
 - a) to review experience in developing and applying ecological networks;
 - b) to promote cooperation in the further development of ecological networks at regional and international level, with a special focus on ecosystems and species that extend across national frontiers;
 - c) to report on these issues to the next World Conservation Congress.

First published by:

AIDEnvironment, Amsterdam

Designed by:

Marc Hegemans, Haarlem

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