ACTION PLAN FOR THE PROTECTION AND RESTORATION OF FLOODPLAIN FORESTS ON THE BULGARIAN DANUBE ISLANDS 2003–2007

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and
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I. Abbreviations

AI	Auen-Institut, Institute for Floodplains Ecology
AP	Action Plan
BGN	Bulgarian levs
	Euro
FP	Forestry Plan
FRG	Federal Republic of Germany
FSC	Forest Stewardship Council
GB	Green Balkans
GEF	Global Enviroment Facility
GIS	Geographic Information System
GPS	Global Positioning System
MAF	Ministry of Agriculture and Forests
MoEW	Ministry of Environment and Water
MP	Management Plan
NFB	National Forestry Board
NGO	Non-governmental Organization
NR	Nature Reserve
PA	Protected Area
RB	Republic of Bulgaria
RFB	Regional Forestry Board
RIEW	Regional Inspectorate on Environment and Water
SFU	State Forestry Unit
WB	World Bank
WWF	World Wide Fund for Nature

Preface

While implementing its permanent policy for sustainable management of Bulgarian forests, the Ministry of Agriculture and Forests strives for the achievement of effective balance of their ecological, economic and social functions, in compliance with the national legislation in the field of nature-protection and forest management, as well as with the more general context of the European Union's normative and strategic documents, and respectively with their practical implementation on a Pan-European level.

Due to the clear vision introduced by the Strategy for the Protection and Restoration of Floodplain Forests on the Bulgarian Danube Islands (2001) with regard to the conservation of biological diversity, the permanent improvement of economic dimensions and the introduction of local communities to the processes of decision making, we are able to implement real, practical and mostly successful activities, which shall fully satisfy the expectations of all parties interested in the process.

Through the implementation of the set of activities directed to the protection of existing forests and the creation of new forests of native species, the intensification of poplar timber production and creation of conditions for alternative sources of livelihood for local people, the Ministry of Agriculture and Forests shall implement the best practices for multifunctional forest management. In this way a successful model will be applied, having a demonstration effect going beyond the scale of national importance.

The present Action Plan is an important part of the practical contribution of the Republic of Bulgaria to the establishment of the Lower Danube Green Corridor. We are truly convinced that the implementation of the Plan during the next five years will play a defining and catalytic role for the provision of the necessary vitality of the mutual initiative between Bulgaria, Romania, Ukraine and Moldova. It will also bring a substantial contribution to the formation of an adequate and coordinated management policy for the natural resources in the entire Danube-Carpathian ecoregion.

Doctor eng. Meglena Plugchieva

Deputy Minister
of Agriculture and Forests

With the adoption in 2001 of the Strategy for the Protection and Restoration of Floodplain Forests on the Bulgarian Danube Islands, the forestry policies related to the island forests management have been reoriented to the implementation of the main principles and requirements for the protection and restoration of biodiversity.

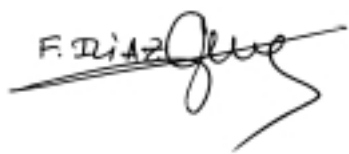
The planned strategic goals, such as halting the conversion of natural forests on the islands, expansion of protected areas network and improvement of their management, and particularly the restoration of floodplain forests on proper sites, are in full compliance with the requirements of international conventions and European
Directives in the field of nature protection.

The above mentioned arguments make the present Action Plan, as a document for the Strategy's implementation, the most important next step leading to the practical Bulgarian contribution to the protection of biodiversity on the islands, part of our national conservation policy related to the Bulgarian part of the Danube, and contribution to the accomplishment of our obligations to the establishment of the Lower Danube Green Corridor.

The complex approach applied in the Plan, which is related to concrete activities and sites for the restoration of forests of native species, as well as to concrete activities for the protected areas designation and management, is indicative of the unanimity and cooperation between the Ministry of Agriculture and Forests and the Ministry of Environment and Water in the field of nature protection. We believe that this cooperation will continue, and the Ministry of Environment and Water will fulfill its part of the common efforts for the practical implementation of the tasks included in the Action Plan. We hope this approach will serve as a model for other countries in the Danube region and will enhance our cooperation with them.

Fatme Iliaz

Deputy Minister
of Environment and Water



Introduction and Background

The Lower Danube, together with the river delta at the Black Sea, is one of the world's outstanding freshwater ecoregions. On the Bulgarian Danube Islands (75 islands with a total area of 10 713,4 ha), 53 main types and combinations of habitats have been described, ranking their diversity as high as Bulgaria's largest National Parks. The floodplain forests, channels and marshes on the islands are integral parts of the Danube migration corridor, essential for the distribution of many plant and animal species. These habitats support biodiversity of national, European and global importance.

The different management policies for these areas, carried out for the past 50 years, have entailed processes threatening the ecological balance, including decrease of the natural floodplain areas, loss of freshwater habitats and habitats of threatened plant and animal species.

The halting of these processes requires the achievement of compromise between the economic and conservation goals. The analysis of poplar economy on the islands indicates that a feasible economic compromise can be achieved, entailing the prevention of further conversion of floodplain forests into poplar plantations, and setting aside 30% of the plantation area that will be logged within the next five years for floodplain forest restoration. The effects of reduced poplar production can be mitigated by a number of measures including certification of the islands' forests, which can provide higher selling prices of produced timber, intensification in the areas that will continue to be used for poplar timber production, as well as alternative sources of livelihood for local people, such as eco-tourism, sustainable use of forest resources, hunting, fisheries, etc.

In 2001 the Ministry of Agriculture and Forests and the Ministry of Environment and Water adopted a Strategy for the Protection and Restoration of Floodplain Forests on the Bulgarian Danube Islands, which establishes the framework of a new management policy. As partners to the Strategy have been involved the World Wide Fund for Nature (WWF) – Danube-Carpathian Programme and the Institute of Floodplain Forests, and the Bulgarian non-governmental organisation Green Balkans. The Strategy defines the integral strategic goals of the protection and restoration of natural floodplain forests, improvement of the protected areas network, institutional strengthening and sustainable use of timber and non-timber forest products on the islands. The present Action Plan was developed for the implementation of the Strategy.

The Action Plan includes restoration of 275 ha of floodplain forests and 200 ha of internal channels and marshes on the islands. Optimisation of the protected areas network is envisaged – expansion of the area with 1 400 ha through the designation of new protected areas, re-cate-

gorisation of existing protected areas, and development of management plans. Practices for sustainable use of the Danube Islands will be introduced through the certification of 6 300 ha of forests, development and publishing of a good forestry practices manual, and through the carrying out of workshops at which discussions with local experts will be held. Scientific and monitoring activities have also been envisaged to assess the effect from restoration activities. Another goal of the Plan is the improvement of staff qualifications and institutional strengthening of relevant institutions through the training of selected experts, exchange of experience with foreign experts and carrying out of specialised thematic seminars.

The total expenses for the implementation of the Plan amount to 1 345 330 Euro.

The government will contribute financially to the implementation of some priority conservation activities on the islands and will actively search financing from national sources and international donors for the Strategy's full implementation. Some of these activities have been provided for by present or forthcoming governmental projects with international financing. These are for instance the Wetland Restoration and Pollution Reduction Project (2002 – 2008) financed by GEF/World Bank, the Government of Austria and national sources (a total amount of 11.7 million USD) and the Institutional Strengthening, Capacity Building and Integrated Management Planning for the Protected Wetlands Persina Nature Park and Kalimok - Brushlen Protected Area Project (2003 – 2007), financed under the PHARE National Programme (a total amount of 2 million EURO). Restoration of priority wetland areas in the Danube River Basin, sustainable use of natural resources, monitoring, ecological training and raising of public awareness are envisaged under the first project. The second project includes institutional strengthening of the above mentioned protected areas administrations, development of management plans, implementation of programmes with model activities, including public awareness raising and development of programmes for natural resources monitoring. Both projects will be implemented within the Persina Nature Park and Kalimok –Brushlen Protected Area. Some of the envisaged activities are much related to the Danube Islands and the Strategy implementation.

Eng. Iliya Simeonov

Head of the National Forestry Board

IV. Status of the Bulgarian Danube Islands

1. Conservation Importance and Ecological Functions of Natural Floodplain Forests on the Danube Islands

The Lower Danube is one of the most valuable freshwater ecoregions in the world. The hydrological dynamics of the river, its continually active erosion and sedimentation activities, combined with periodic flooding of the river terraces of different duration, level and frequency, have determined the formation of the Danube islands, their unique vegetation and rich biological diversity.

14 groups of habitats with 53 main types and combinations have been identified on the Bulgarian Danube Islands, ranking their diversity as high as Bulgaria's largest National Parks. Seven islands and island groups are Important Bird Areas, four of them are important areas for the conservation of European flora and fauna under the European programme CORINE BIOTOPES, and one of the islands is part of a Ramsar site.

The Danube islands are one of the five most representative sites in Bulgaria for several types of habitats included in Annex I to the Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora:

3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* – type vegetation
92A0 *Salix alba* and *Populus alba galleries*
91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)*
91F0 Riparian mixed forests of *Quercus robur*, *Ulmus laevis* and *Ulmus minor*, *Fraxinus excelsior* or *Fraxinus angustifolia*, along the great rivers (*Ulmenion minoris*)
92D0 Southern riparian galleries and thickets (*Nerio-Tamaricetea* and *Securinegion tinctoriae*

The natural habitats on the islands support threatened plant and animal species of national, European and global importance. About 3000 algal species, subspecies and varieties, and over 200 Macromycetae species have been described on the islands. Out of the 300 species of higher plants occurring on the islands, 162 species directly depend on the presence of water. Some of the plants occurring in the islands' forests are included in Annex I to the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention), such as *Salvinia natans,* or in the Red Book of Bulgaria, such as *Leucojum aestivum, Euphorbia lucida, Potamogeton trichoides, Nymphoides peltata* and others. On Vardim island, there are extremely rare floodplain forests dominated by the so-called "Vardim oak" (endemic variety of the Common oak *Quercus longipes Stev.*), forming large forest areas of over 200-year-old trees.

The right bank of the Danube is subject to permanent erosion activities. The floodplain forests vegetation of native species contributes to the banks' strengthening and helps to mitigate erosion.

About 1 100 animal species occur on the Danube islands. More than 65 fish species occur in the river, in internal channels and island marshes. The lower part of the Danube is the most important Bulgarian habitat for 6 Sturgeon species. After the construction of dykes along the banks and the destruction of most riparian marshes, the internal channels, wetlands and floodplain forests on the islands' banks became the most important habitats of phytophilic and plankton-eating fish species, as well as the only alternative spawning sites of fish species whose life cycle depends on stagnant waters. Floodplain habitats are of crucial importance for the Danube fish populations, which are important food base for fish-eating birds, as well as of social and economic importance for the part of the local population fishing for subsistence.

11 amphibian and 6 reptile species have been described on the islands. The island forests are the habitats for over 160 bird species, more than 100 of which nest on the islands. These forests support some of the largest colonies of Egrets *(Egretta alba, E. garzetta)*, Cormorants *(Phalacrocorax phalacrocorax, Ph. pygmeus)* and Spoonbills *(Platalea leucorodia)*. The islands are important nesting, resting and wintering sites for globally threatened species such as Dalmatian pelican *(Pelecanus crispus)*, Red-breasted goose *(Branta ruficolis)* and Pygmy cormorant *(Phalacrocorax pygmeus)*. They are one of the last remaining habitats of the White-tailed eagle *(Haliaeetus albicilla)* in Bulgaria. Of the mammals inhabiting these biotopes, the European river otter *(Lutra lutra)* is included in Annex II to the Bern Convention.

The islands' floodplain forests, channels and marshes are integral part of the Danube migratory corridor, essential for the distribution of many invertebrates and fish, and for many fish-eating bird species during their nesting and seasonal migrations. Without these habitats, migration would be difficult, and for a number of species impossible.

The local people use the Danube islands for excursions and recreation. The conservation and promotion of their rich biodiversity could be an incentive for the development of national and international tourism on the islands.

2. Forests Status and Trends

Since the early 1960s, the Bulgarian Danube islands have been subject to targeted intervention for the development of poplar forestry. In some years, hybrid poplar monocultures have covered over 75% of the island area. Most of the preserved natural floodplain habitats are on small islands at the initial stages of succession, far from their ecosystem climax. Remnants of floodplain vegetation are also preserved along

the banks of the bigger islands, but they can hardly be considered entirely natural, since their areas are limited and subject to the impact of adjacent intensive poplar plantations. As a result of human activities the spread of aggressive introduced species has been facilitated.

At present 5 253.2 ha or 83.9% of the islands are covered with forests of natural origin or intensive cultures. In order to present their characteristics in a systematised way and identify origin suitable places for restoration and protection, during the development of the Strategy for the Protection and Restoration of Floodplain Forests on the Danube Islands (2001) all vegetation communities on the islands were conditionally classified based on their tree species composition, and on the presence of the aggressive introduced species *Amorpha fruticosa.*

Based on these criteria, island areas are classified into the following main groups:

A) Open areas – without tree vegetation.
B) Natural forest communities – only of native tree species, only with natural seed or coppice origin.
C) Semi-natural forest communities – mixed forests of native species, hybrid poplar and willow, or forests of native species with artificial origin (seed or planted).
D) Artificial communities – dominated by hybrid poplar and willow, as well as by other introduced species – *Fraxinus pennsylvanica, Juglans nigra, Taxodium distichum*.

The table below presents the current distribution of forest types by area and percent (excluding Belene island)*, as well as their future distribution, if the current Forestry plans are implemented.

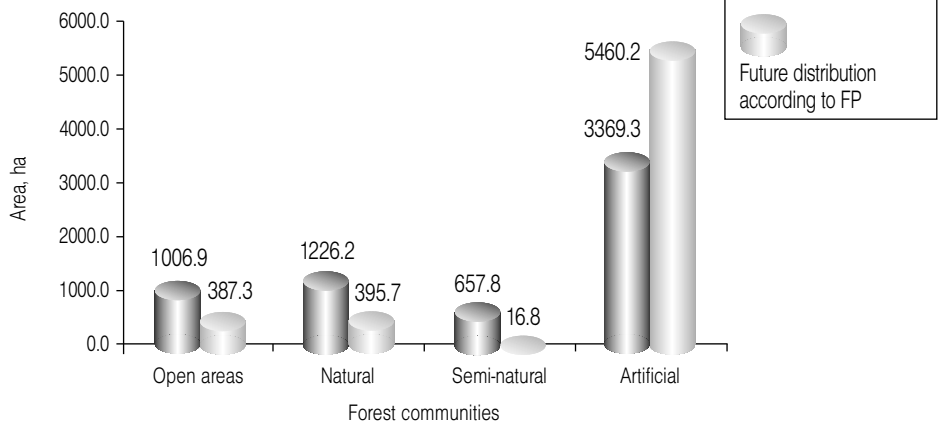
Table 1. Distribution of forest communities on the Danube islands and future trends, based on the operative Forestry plans (FP)

	Communities	Current composition		Future composition	
		Area, ha	%	Area, ha	%
A	Open areas	1 006.9	16.1	387.3	6.2
B	Natural forest communities	1 226.2	19.6	395.7	6.3
C	Semi-natural forest communities	657.8	10.5	16.8	0.3
D	Artificial communities	3 369.3	53.8	5 460.2	87.2
	Total (excluding Belene island)*	**6 260.1**	**100.0**	**6 260.1**	**100.0**

* The Action Plan does not present data about Belene island because there are no up-to-date Forestry plans for the site, thus up-to-date and correct data is missing.

As revealed in the last two columns, if current Forestry plans are implemented, natural and semi-natural forests on the Danube islands will decrease, and some types will disappear in the next five years, on the account of increased areas of hybrid poplar plantations. The trends for the main forest types are illustrated on Fig. 1 below:

Fig 1. Current and future disdtribution of forests on the Danube Islands according to the Forestry Plans



The figure indicates that the Forestry plans envisage a drastic decrease of all native species – Ash, Vardim oak, White willow, White and Black poplar, Elm and Mulberry trees. Areas covered with native tree species would decrease from a current 30% to a planned 7.7%. Some native species covering small areas or represented by single trees, such as Sycamore, Pear, Aspen, Ash tree and Large-leaved lime, will completely disappear. The current state of the islands' forests and the trends in the Forestry plans conflict with the conservation importance and the needs of the islands. Management practices need to be revised in order to preserve and restore the outstanding biodiversity of the islands.

3. Protected Areas

Prior to the adoption of the Strategy for the Protection and Restoration of Floodplain Forests (2001), the existing protected areas network on the Danube Islands consisted of 7 sites with total area of 1048.3 ha (excluding Belene island). The analysis of the network characteristics as a whole and of the separate sites in line with the Strategy, revealed the following facts:

- The protected areas network on the Danube Islands covers only 10% of their total area;
- Within protected areas fall a bit more than 10% of the identified natural and semi-natural forest communities on the islands;
- In some of the protected areas /"Persin – Iztok" and "Stariya dub"/ the relative area covered by poplar plantations is too large – from 60 to 90%;
- The regimes of some protected areas prohibit logging, afforestation and/or hunting, thus being an obstacle for restoration activities in line with the Strategy;
- No management plans are developed for any of the protected areas and no actual target-driven activities are applied for the restoration of forests of local species, no monitoring is carried out of important biodiversity elements, no public relations exist and so on;
- Forestry plans for some of the protected areas envisage the substitution of natural forests with poplar plantations.

In the period between the development of the Strategy and the present Action Plan two new protected areas were designated – "Persina" Nature park and "Kalimok – Brushlen" Protected area, including also several new islands with a total area of 1 721 ha. Thus some quantity and quality parameters of the protected areas network changed in a positive direction:

- The protected areas network now covers 2 769.3 ha or 33% of the Danube Islands area (excluding Belene island);
- Now 66% (about 6 times more) of the natural forest communities on the islands fall within protected areas.

However the main conclusions and the underlying Strategy objectives for the final development of the protected areas network and particularly for the improvement of the separate sites management are undoubtedly pressing and thus they form a basic element of this Action Plan.

V. Threats to Biodiversity on the Danube Islands

The present state and the marked trends in natural resource management bring to the forefront a number of threats to the biodiversity on the Danube Islands, that were identified in the development process of the Strategy for the Protection and Restoration of Floodplain Forests:

Conversion of natural floodplain forests to intensive poplar and willow plantations, including those in protected areas

Direct conversion is the biggest threat to natural forest communities. Technological activities during afforestation in addition damage or destroy characteristic and valuable microhabitats such as small wetlands and channels. The wide distribution of intensive poplar plantations entails decrease or loss of genetic diversity of native tree species, which brings to their limited distribution and limited possibilities for natural reproduction of viable populations. Timber harvesting very often affects key habitats of the Danube River migratory corridor and damages its integrity. Thus existing and potential habitats of colonial and individual nesting birds are destroyed and the birds are disturbed during their reproduction period.

Expansion of areas taken by aggressive introduced species

Such an aggressive introduced species is, for example, the Amorpha *(Amorpha fruticosa)*. As a consequence from the expansion, native herbaceous and shrub species are supplanted, the process of natural reproduction of native tree species is hampered and the habitat conditions are changed.

Decrease of the food base for native wild animal species

The destruction of internal channels, which are the spawning sites for a number of fish species, has a negative impact on their populations and leads to a decrease in the food base for fish-eating birds (as well as to a decrease in the economic resource for local fishermen). The reduced plant diversity leads to the decline of certain bird species, for example *Passeriformes*.

High numbers of some game species

The high numbers of some game species, such as Wild boars and Deers, threaten the natural reproduction of oak and softwood species on the islands. These animals also present a potential threat to the results of restoration activities.

Poaching

Game and fish poaching have no substantial impact on the goal of floodplain forest restoration, though they lead to disturbance and decrease of some game and fish populations, and thus to a certain extent hamper the achievement of the strategy goals related to the protection of biodiversity on the islands.

Weak institutional capacity

The lack of possibilities for effective control is most of all related to the insufficient amount of equipment available to regional and local bodies of the Ministry of Agriculture and Forests/National Forestry Board and of the National Agency for Fisheries and Aquaculture. The insufficient technical equipment (transport, means of communication, etc.) to carry out fast and effective control and co-ordination is a serious problems for the biodiversity conservation on the islands. The same applies for the regional structures of the Ministry of environment and water. There is also a serous need for specialized training of the staff of these bodies responsible for sustainable management of the Danube islands.

VI. Strategic Management goals for the Danube Islands

In view of the ecological importance of island floodplain forests, their current state and the threats to their survival, as well as the international commitments and the national responsibility of Bulgaria to conserve the richness of its natural ecosystems, The Ministry of Agriculture and Forests and the Ministry of Environment and Water, in co-operation with national and international non-governmental organisations, developed a Strategy for the Protection and Restoration of Floodplain Forests on the Bulgarian Danube Islands. The Strategy, endorsed in 2001, lays the base of a new policy for management and use of island floodplain forests and sets the following goals:

1. **Conservation of existing natural forest communities on the Danube islands.**
2. **Increase in the total area of floodplain forests of native species on the Danube islands.**
3. **Protection and restoration of habitats of rare, threatened and economically important wild plant and animal species.**
4. **Conservation of the genetic pool of native tree species on the Danube islands.**
5. **Establishment of conditions for sustainable use of forests and other natural resources.**
6. **Improving of forestry practices in poplar plantations in order to achieve sustainable use and protection of restored and existing natural floodplain forests; decrease of negative impacts on adjacent natural areas, increase of effectiveness and decrease of expenses to compensate their reduced area after the implementation of the Action Plan.**
7. **Raising of public and institutional awareness and support.**

VII. Policy, Legal and Institutional Frame of the Action Plan

1. Policy Frame

The present Action Plan comes from, and will contribute to the actual implementation of requirements and commitments to a number of international, European and internal policy frame documents:

- *Convention on Biological Diversity;*
- *Convention on the Conservation of the Wild European Flora and Fauna and Natural Habitats /Bern/;*
- *Convention on the Conservation of Wetlands of International Importance, Especially as Waterfowl Habitats /Ramsar/;*
- *Convention on the Conservation of Migratory Species of Wild Animals /Bonn/;*
- *Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna;*
- *Directive 79/409/EEC on the Conservation of Wild Birds;*
- *Pan-European Strategy for the Conservation of Biological and Landscape Diversity;*
- *Declaration for Co-operation for the Establishment of Lower Danube Green Corridor;*
- *Strategic Action Plan for the Danube River;*
- *National Strategy for Biodiversity Conservation;*
- *National Action Plan for Biodiversity Conservation;*
- *National Wetlands Plan;*
- *Declaration on Wetlands in the Bulgarian Part of the Danube River Basin.*

2. Legal Frame

The legal justification, the responsible institutions, as well as the concrete procedures and other tools for the implementation of the main activities underlying the Action Plan, underlie several legal acts and the ensuing from them sub-law normative acts:

- *Protected Areas Act /1998/* – implemented by the Ministry of Environment and Water and the Ministry of Agriculture and Forests, and respectively the National Forestry Board and their departments;
- *Forestry Act* – implemented by the Ministry of Agriculture and Forests, and respectively the National Forestry Board and its departments;
- *Biodiversity Act* – implemented by the MoEW and MAF, and respectively their regional departments;
- *Rules for the implementation of the Forestry Act* – implemented by the Ministry of Agriculture and Forests, and respectively the National Forestry Board and its departments;
- *Regulation for the Development of Management Plans for Protected Areas /2000/* – implemented by the Ministry of Environment and Water.

3. Implementation Responsibilities

Based on national legislation, the institutions and the other potential bodies and organisations, which should take part and be responsible for the implementation of the Action Plan, are the following:

- Ministry of Agriculture and Forests, and respectively the National Forestry Board and its departments – they are responsible for the set of activities related to floodplain forests restoration, conservation of their genetic resources, monitoring of forests, management of protected areas /implementation of management plans/, education and so on;
- Ministry of Environment and Water – it is responsible for activities including the establishment of the protected areas network, development of management plans for protected areas, education and so on;
- Nature protection non-governmental organisations – they carry out specific research or monitoring of biodiversity, activities providing publicity and public support for the implementation of the Plan.

VIII. Content of the Action Plan for the Protection and Restoration of Floodplain Forests on the Bulgarian Danube Islands for the 2003 – 2007 Period

For the period 2003-2007, the Ministry of Agriculture and Forests (National Forestry Board) and the Ministry of Environment and Water set the following targets for the implementation of the Action Plan:

- Complete and permanent halting the conversion of natural floodplain forests to poplar monocultures on the Danube Islands;
- Restoration of floodplain forests of native species on an area of about 275 ha;
- Restoration of the hydrological regime of priority floodplain habitats of the Danube Islands;
- Expansion and optimisation of the management of the protected areas network on the Danube Islands;
- Development and introduction of good forestry practices for poplar plantation and floodplain forest management on the islands;
- Building of local capacity and awareness for the Action Plan implementation.

The concrete activities for the achievement of each of these goals are presented below.

1. Protection and Restoration of Floodplain Forests

1.1. Protection of existing floodplain forests of local species

Currently natural floodplain forests cover 1 226.2 ha or 19.6% of the total area of the Danube Islands. According to the provisions of the operative Forestry plans, their area should be decreased to 395.7 ha or to 6.3% of the islands total area. One of the most significant goals set by the Strategy is the protection of those remaining natural forests. The policy of floodplain forests protection will also be confirmed by the alteration of the operative Forestry Plans excluding from them the provisions for the conversion of natural forest communities to monocultures and including the protection of the existing natural floodplain forests. During the alteration of Forestry Plans the new composition will also be defined, that is expected after the restoration of natural floodplain forests.

1.2. Restoration of former floodplain forests

The restoration of former floodplain forests will take place on an area of about 275 ha and will aim to reach such a state of species composition and structure that is possibly closest to the natural one. The restoration will be implemented or facilitated for appropriate local tree species that are a habitat-forming factor. Thus natural restoration processes in communities will be stimulated. The long-term goal is to acquire the complex structure and diversity of species and microhabitats, characteristic to natural ecosystems. With this regard technological restoration plans have been worked out, which take into consideration the special features of selected sites, the typical natural vegetation and the most appropriate and applicable restoration methods.

1.2.1. Selection of restoration sites

As potential restoration sites of former floodplain forests are identified those that meet one of the three main criteria, pointed out in an annex to the Strategy:

- Pure cultures of hybrid poplars or willows whose turnus of logging expires within the next five years.
- Semi-natural forests – with mixed composition of native and non-native species, hybrids and varieties.
- Bare areas covered by aggressive introduced species or logged areas.

The total area of sub-groups meeting at least one of the above criteria is 1908.5 ha and their number is 318. One of the Strategy targets envisages restoration of 275 ha of former natural floodplain forests. In order to make the selection more precise the following additional criteria are used, listed in order of their importance for the implementation of the Strategy goals:

K_1: Sites within protected areas
K_2: Sites adjacent to protected areas
K_3: Small areas of poplar plantations or logged areas surrounded by natural forests
K_4: Cultures with single representatives of native species
K_5: Sites adjacent to wetlands – internal channels, marshes, bogs, floodplain areas

K_6: Islands far from ports (more than 5 km)
K_7: Small islands
K_8: Areas surrounding nesting colonies and single nests

The sub-groups were assessed according to their restoration priority. Each criterion was given a certain weight and the criteria were applied to each of the sub-groups.
Considering that the initial selection of restoration sites was based on chamber processing of up-dated data from operative Forestry Plans, which entails the probability of alteration of the actual state in the meantime, the bigger areas (about 400 ha) were identified in sub-groups of highest conservation priority.

The selection of sites for restoration was carried out after the necessary field research. 45 sub-groups were selected on a total area of 275.4 ha on the territory of the following state forestry units:

- **Nikopol: sub-groups 133 b,1,2; 116 a;**
- **Svishtov: sub-groups 38 b,e,k; 42 d,e,f,h; 43 a,b,f; 45 c,k,l; and**
- **Tutrakan: sub-groups 2 f,g; 3 c,e,f,g,i,k,l; 12 d,e,f,g,l,m,n; 17 c,d; 18 g,h,i,k,l; 19 c,e,g; 20 e,i.**

Additional possibilities for restoration activities on other model sites in the region are under consideration. After the implementation of planned restoration activities, the distribution of forests on the Danube Islands should be changed as follows (in comparison with the current state and current Forestry plans):

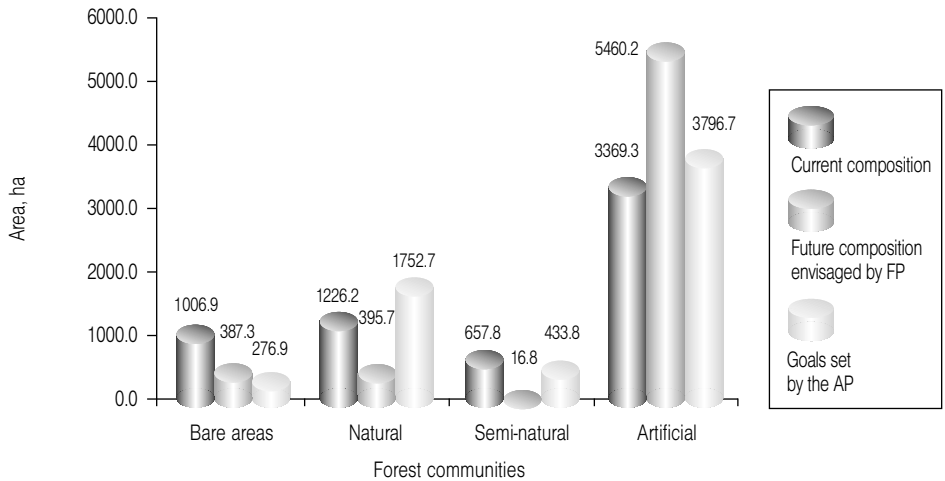
Table 2. Comparison between the distribution of bare areas and forest communities on the Danube Islands according to the current and to the altered Forestry plans:

		Current composition	%	Future composition according to FP	%	Future composition according to MP (revised FP)	%
A	Open areas	1 006.9	16.1	387.3	6.2	276.9	4.4
B	Natural forest communities	1 226.2	19.6	395.7	6.3	1 752.7	28.0
C	Semi-natural forest communities	657.8	10.5	16.8	0.3	433.8	6.9
D	Artificial communities	3 369.3	53.8	5 460.2	87.2	3 796.7	60.6
	Total (excluding Belene Island)	**6 260.1**	**100.0**	**6 260.1**	**100.0**	**6 260.1**	**100.0**

In this way plantations of native species will be established on an area of 105.2 ha current open areas or areas covered by aggressive introduced species. 156.4 ha of hybrid poplar monocultures that have reached their turnus will be converted to new plantations of native species and 13.8 ha of semi-natural forests will be converted to natural forests. Thus the total area of newly formed natural forests will be 275.4 ha, and 433.8 ha of semi-natural forests will be managed in a way to ensure their conversion into forests of native species. The area of poplar plantations will increase by 427.4 ha. The area of forests of native species will increase by 526.5 ha on the short run, and by 960.3 ha in long-term perspective (this involves also the present semi-natural forests).

The Forestry plans of the corresponding Danube State Forestry Units will be revised to reflect the altered composition according to the Action Plan.

Fig 2. Comparison between the distribution of forests on the Danube Islands – current distribution, envisaged by FP and according to the goals set by the Action Plan



1.2.2. Restoration methods

a) Natural restoration without human interference

This approach means that no activities are implemented on existing bare areas or on areas selected for restoration, after the elimination of hybrid poplar and willow cultures.

Advantages:
- No expenses
- Conditions are created for natural succession

Disadvantages:
- Conditions are established for aggressive introduced species to occupy the area – Amorpha
- No economic benefits from timber harvesting can be expected in the near future

Possible application: Sand strips, floodplain areas on the banks of islands, marshy areas within the islands.

b) Gradual restoration

The substance of this method consists of single or several (once in every few years) openings of cauldrons in the hybrid culture. The cauldrons are planted with appropriate native species. Depending on the size of cauldrons and on the number of interventions, a certain part of the existing tree stand of hybrid poplars is left to die naturally.

Advantages:
- Conditions are established to form a plantation of trees of different ages
- No conditions for the introduction of Amorpha

Disadvantages:
- It is an expensive method, especially if activities are implemented several times
- Trees of hybrid origin are not completely eliminated
- It is related to benefits foregone – cauldrons can be only opened in cultures that have not reached their turnus; part of the initial tree stand remains unused
- Lack of possibility to use equipment during the afforestation
- The possibilities for its implementation are limited considering the short turnus of hybrid poplar cultures in Bulgaria

Possible application: Poplar cultures with a longer turnus – for Bulgarian conditions this is a period of 25 years; semi-natural communities – cauldrons should be formed at sites where hybrids and non-native species predominate.

c) Complete restoration without soil preparation

About 90-95% of a poplar culture that has reached its turnus is logged. About 5-10% of the existing tree stand remains intact – those are usually damaged trees whose timber cannot be used, but that can have a habitat-forming significance. Big-sized saplings of appropriate native tree species are planted.

Advantages:
- The method is economically viable – expenses for soil preparation are saved; the number of planted saplings is low
- No conditions for the introduction of Amorpha

Disadvantages:
- No conditions for the establishment of tree plantations of different ages
- Limited possibilities to use equipment during the afforestation

Possible application: All poplar cultures.

d) Complete restoration following bare logging and subsequent soil preparation

This is a traditional approach of the present management policy concerning hybrid poplar cultures on the islands. In order to fulfil the Strategy goals, after the bare logging and the subsequent most often complete soil preparation, instead of hybrid poplars saplings of native species are planted appropriate to the relevant features of the site.

Advantages:
- This is a traditional and well-known method
- The hybrid individuals of the initial tree stand are completely eliminated

Disadvantages:
- It is an expensive method considering the necessity to prepare the soil
- The breaking of soil creates conditions for the introduction of Amorpha
- There are no conditions for the establishment of tree plantations of different ages

Possible implementation: All poplar cultures, bare areas.

e) Facilitating the natural restoration of native species

It can be implemented in case single or over-canopy trees of native species have remained in the hybrid cultures. Cauldrons can be opened around them in order to inseminate them in case a seed-forming year is ahead, or to release the young growth in case it already exists.

Advantages:

- It is a traditional and well-known method
- Minimum expenses
- The origin of the future tree stand is guaranteed
- Conditions are created to form tree plantations of different ages

Disadvantages:

- The method is applied depending on seed-forming years
- In some cases the elimination of hybrid poplar individuals can be technically difficult

Possible application: Hybrid cultures with conserved single or over-canopy trees of local species or sub-groups with mixed participation of hybrid poplars and local species.

1.2.3. Restoration activities

a) Alterations of operative Forestry plans

One of the most important conditions to guarantee the implementation of the Action Plan in the coming years, is to reflect the planned forestry activities at a sub-group level in the operative or currently developed Forestry plans of the ten state forestry units. Thus within the framework of operation of the Forestry plans the following activities will be provided:

- Halting the conversion of existing forests of local species to hybrid poplar cultures
- Reflecting the optimum future composition of local species in the sub-groups where restoration activities are envisaged
- Reflecting the regimes of limitations in newly designated protected areas and in protected areas to be designated.

b) Selection of sources of reproduction material (seed-vessels) and collection of seeds

One of the main Strategy goals is to conserve the genetic pool of local tree species. With this regard it is of utmost importance to guarantee the origin of reproduction material during the implementation of restoration activities, and especially when establishing plantations of local species at sites currently covered by poplar monocultures. The most appropriate representatives have to be identified of the local species *Quercus longipes, Ulmus campestre, Ulmus laevis, Ulmus minor, Fraxinus oxycarpa, Populus alba*

(veg.-gen.), *Populus nigra* (veg.-gen.), *Salix alba, Morus nigra, Pyrus communis, Malus silvestris* from which to take seeds or material for vegetative reproduction. It is necessary to collect about 4 300 kg of seeds of the mentioned species.

c) Production of saplings

The restoration activities would require about 2 millions of saplings. Their production is envisaged to take place in the nursery at Svishtov State Forestry Unit, Vardim village. Additional possibilities will be sought to plant saplings taken from under the canopy of existing natural plantations.

d) Preparation of areas for afforestation

As a precondition, the Action Plan assumes that the soil of all restoration sites will undergo preparation. The implementation of restoration activities will aim to reduce the expenses for soil preparation by tolerating natural regeneration or, when possible, using some of the restoration methods that do not require soil preparation. Final decisions will be taken during the implementation of activities, according to the concrete conditions at the different sites.

e) Afforestation

Planting of saplings and sowing of seeds are the main afforestation methods used in Bulgaria. The first method will be preferentially used during the implementation of restoration activities on the islands, particularly in the case of oak acorns, because wild boars are very probable to compromise the afforestation. Afforestation will be implemented according to the developed technological plans with such species and in such a way, which provide optimum diversity of species and microhabitats possibly closest to the natural state.

f) Cultivation and replenishment of cultures

In order to create optimum conditions for the growth and development of young saplings, cultivation activities will be carried out in the afforestated sites. They comprise of mulching, mowing and trenching of rows, and of ploughing, cultivating and harrowing between the rows, as well as elimination of weeds in order to terminate competition and keep the soil damp within the first three years. In order to maintain the initial density, pointed out in the technological plan for afforestation, the established cultures are being replenished. For this purpose saplings are used of the same or of another appropriate tree species.

2. Restoration of the Hydrological Regime of Priority Habitats

Among the most important and valuable habitats on the Danube Islands are the temporary and permanent water bodies, formed in the mere process of island formation by the activities of Danube currents and the river dynamics. These include the internal channels and the internal island marshes, which are an important habitat for a big number of animal species and reproduction sites for amphibians and reptiles. From

an economic point of view these are mainly the habitats where fishing of industrial species takes place: Wels, Carp, Pike, Pike-perch. After the construction of dykes on the river banks and on Belene island, these are the only habitats in the Bulgarian part of the river, where Danube fish can reproduce and grow.

In the process of economic use of the islands and particularly in the processes of timber harvesting, construction of forest roads and mechanical afforestation of forest cultures, most of the internal channels have been partially or entirely blocked. Dykes have been constructed on the biggest internal marshes on the Danube islands, thus breaking their connection with the Danube and condemning them to destruction, to intensive eutrophication processes and decreased ecological importance.

A technological plan has already been developed for the restoration of the most important internal channel on Vardim island – Runtava bara.

The current Action Plan envisages a research to be carried out of internal channels and channels between the islands /total area of 544 ha/ for the whole system of Danube Islands. The necessary restoration activities will be considered and technical plans will be developed for the restoration. The approximate area envisaged for channel restoration corresponds to the area of internal channels given in Forestry plans – 218,72 ha. The GEF/WB *Wetlands Restoration and Pollution Reduction Project* envisages design and construction of facilities for restoration of the hydrological regime of about 300 ha from the biggest and most important marshes for Belene island's biodivesity /Peschina, Murtvoto and Djulova bara/. According to the project, the total area of wetlands to be restored on Belene island is about 1 290 ha. In addition, activities for the management and maintenance of the restored wetlands and some associatiated to them sites of high importance, such as floodplain forests, are foreseen in the project.

3. Optimisation of the Protected Areas System

The Action Plan envisages a number of activities related to the optimisation of the protected areas network, entailing the fulfilment of two basic goals underlying the Strategy:
- Protection of natural forest communities;
- Protection and restoration of habitats of protected and rare species.

For the implementation of these goals three groups of activities and steps will be taken:

3.1. Expansion of existing and designation of new protected areas

The following criteria are used for the selection of sites suitable to be included in the protected areas network on the Bulgarian Danube Islands:
- Sites covered by natural forest communities;

- Bare sites that are habitats of species listed in the Habitats Directive;
- Semi-natural forests with local species not occurring in existing protected areas;
- Sites with bird colonies.

The first sites selected to become new protected areas are unevenly distributed on the islands. To a large extent this is a limiting factor for the clear territorial differentiation of potential protected areas, i.e. there are no entire islands or compact parts of them suitable to form a protected area. Apart from that, most of the sites selected as suitable for floodplain forests restoration, turned out to be adjacent to the sites selected for protection. These circumstances defined the final approach to the selection of sites suitable for the expansion of the protected areas system.

As a result from the analyses and in line with the Strategy, the Action Plan envisages gradual expansion of the protected areas network in the next five years with new 1 225.7 ha. With this regard 3 existing protected areas will be expanded and 9 new protected areas will be designated. The implementation of these activities should take place within the duration of the Action Plan, giving priority to the sites for which management plans shall be developed. Proposals shall be developed for all the selected sites, according to the requirements of the Protected Areas Act.
Finally, if the Plan is successfully implemented, 3 479.5 ha of the Bulgarian Danube Islands /excluding Belene island/ would fall under protection, which is 55.6% of their total area. The part of natural forest communities falling within protected areas would then increase to 89.3% of their total distribution on the Danube Islands.

In the process of the Action Plan implementation constant observation of the engenderment of new islands in the Bulgarian sector of the Danube river will be carried out. The newly engendered islands are a key habitat for the feeding and rest of numerous bird species and for the breeding of the Danube fish. The aim is to preserve the newly engendered islands without human intervention. If the area they occupy exeeds 30 ha the procedure of their formal designation as protected areas will be started.

3.2. Improving the protected areas management

The following activities are envisaged, with regard to:

Revision and updating of the categories and regimes of existing protected areas
The category of some protected areas will be altered, for example of Nature site “Persin – Iztok”, to comply with the requirements of the new Protected Areas Act. The enforced limitation regimes of all protected areas will be revised and, if necessary, altered to provide normative basis for the implementation of the envisaged by the Action Plan restoration and other activities. These are purely administrative meas-

ures to be carried out according to the procedures envisaged in the Protected Areas Act by the Ministry of Environment and Water, in co-ordination with the Ministry of Agriculture and Forests, and respectively the National Forestry Board.

Development of terms of reference and management plans for protected areas

4 ToRs and respectively 4 management plans for 2 existing and 2 newly designated protected areas will be developed within the duration of the Action Plan. Priority sites have been selected, including: "Stariya dub" Protected area on Vardim island, after the expansion of its boundaries; "Ibisha" Managed reserve on the island of the same name; the Western part of Baikal island, after its designation as a protected area; the Eastern part of Aleko island, after its designation as a protected area.

Apart from that, management plans are envisaged to be developed for "Persina" Nature park and Protected area "Kalimok - Brushlen", including the island groups falling within their boundaries. There are already approved Terms of Reference for the latter management plans and they will be financed by the *Institutional Establishment, Capacity Building and Integrated Management Planning for Protected Wetland Areas* Project under the PHARE National Programme.

Management plans are expected to cover 6 protected areas including more than 5000 ha island area, with Belene island in this figure.

4. Introduction of Practices for Sustainable Use of the Danube Islands

4.1. Development of a guide for good forestry practices

A guide for good forestry practices on the Danube Islands will be developed for the achievement of:

- Sustainable use and protection of existing and restored natural floodplain forests;
- Improved practices in poplar plantations, in order to:
  - Decrease their impact on adjacent natural areas;
  - Improve the effectiveness and decrease the expenses to compensate for their decreased area after the implementation of the Action Plan.

4.2. Introduction of good forestry practices on the Danube Islands

The introduction of good forestry practices will be achieved through the distribution of the developed guide, presenting it to seminars for state forestries and carrying out of training in protection and restoration of floodplain forests and in good forestry practices.

4.3. Certification of forests on the Danube Islands

The FSC certification of all forests on the Danube Islands would provide safe markets for the harvested timber and could contribute to certain raising of its purchase price. The certification of forests is a natural continuation of the implementation of the current Action Plan objectives in the long run.

5. Building Capacity for Sustainable Management on the Danube Islands through Training of Regional and Local Bodies

5.1. Methods for floodplain forest restoration and management

The implementation of the Action Plan for Protection and Restoration of Floodplain Forests on the Bulgarian Danube Islands will be related to the carrying out of a number of specific forestry activities, including support activities in natural forests, if needed, and also the creation of new forests of native species at sites covered with hybrid monocultures. In the future, the economic aspects will be of utmost importance for island forest management as a whole.

The lack of tradition and practical experience of Bulgarian foresters in the region determines the need of specialised training. Within the framework of the Action Plan such training is envisaged in the following main subjects:

- Importance and ecological functions of natural floodplain forests on the islands;
- Introduction to the new government policy for floodplain forest management;
- Methods for conversion of poplar monocultures and restoration of natural forests of local species;
- Different methods for sustainable management of natural floodplain forests;
- Improved management of poplar plantations in order to increase income and decrease the negative impact on adjacent natural areas;
- Economic aspects of poplar forestry and natural floodplain forests.

As a whole the training will contribute to the application of the developed system of "good forestry practices" in the management of island forests. It is planned to take place in the period 2003-2004. Staff of the following institutions will be trained: Regional Forestry Boards Berkovitza, Lovech, Veliko Turnovo and Russe; State Forestry Units Vidin, Lom, Oryahovo, Nikopol, Pleven, Svishtov, Byala, Russe, Tutrakan and Silistra; Regional Inspectorates of Environment and Water – Montana, Pleven and Russe; Green Balkans NGO.

The training will be organised by the WWF Institute for Floodplains Ecology – Rastatt and carried out in the Federal Republic of Germany, as well as at local Bulgarian sites. Three regional groups will be formed one after the other. The training abroad will last one week for each of the groups. A total of 30 Bulgarian specialists will be trained.

5.2. Protected areas management

The implementation of the present Action Plan is expected not only to develop the protected areas network on the Danube Islands, but also to create conditions for its better management. This is directly related to the skills of the specialists of different responsible institutions at all levels.

To this end the Action Plan envisages a series of training seminars about a wide range of subjects in the field of protected areas:

- European and national policy and practices in the establishment and management of protected areas;
- Monitoring of biodiversity;
- Alternative uses.

The training will be organised mainly in 2003 with the participation of foreign and Bulgarian lecturers. It will consist of three seminars, the participants will be selected by regions, including the staff of 4 Regional Inspectorates of Environment and Water, Danubian Regional Forestry Boards and State Forestry Units, as well as municipal ecologists and representatives of nature protection non-governmental organisations. The total number of participants in these seminars will be about 60.

Activities for capacity strengthening for protected areas management – education, programmes for experience exchange and study visits, seminars – are part of the project *Institutional Establishment, Capacity Building and Integrated Management Planning for Protected Wetland Areas* under the PHARE National Programme. The project covers the areas of "Persina" Nature park and "Kalimok – Brushlen" Protected area.

Beside the above-presented planing, additional possibilities for education, raising of expert knowledge and exchange of experience in the mentioned fields and themes will be sought.

6. Scientific Research and Monitoring

During the restoration of natural forest vegetation on the Danube Islands, monitoring shall be carried out to reveal the degree and effectiveness of implemented activities and to give an idea about the consequences of these activities about key species and habitats.

Prior to the implementation of practical restoration activities, research has to be carried out to provide their conservation and economic effectiveness. This could be, for example, a research on the genetic purity of local species representatives, which could be used as a future source of reproduction material in the

restoration process. Such a research is related to the implementation of activities of seed-vessel selection described in point 1.2.3.

Other key issues about the effectiveness of restoration and conservation activities of autochton ecosystems could be research on the vegetation below the canopy to reveal the potential of local species at test sites and also research on the distribution and development of Amorpha shrubs.

The application of different restoration methods on natural communities on the Danube Islands is a good possibility to make comparative field research from the view point of forestry, ecology and economics, in order to determine the most effective of them. The conclusions made could be used in future activities for the Strategy implementation, after the expiration of the five-year period of the Action Plan. The research should take place at test sites for all methods described in point 1.2.2 of the Plan, under controlled and uncontrolled conditions. During the period of the Action Plan regular annual monitoring should be carried out of the state of monitored plantations.

Regular monitoring should be carried out of the state of big nesting colonies and wintering sites, which are of utmost importance for the protection of conservation important bird species occurring on the Danube Islands. The monitoring will define the impact and effectiveness of Strategy activities on part of the indicator species, characteristic of floodplain forests.

The state of fish populations will be monitored by controlled catch and other types of field research in internal channels and island banks that have remained flooded for a long time. This monitoring is important for identification of the social and ecological importance and the consequences from implemented restoration activities in forest and freshwater habitats on the Danube Islands.

A monitoring system for the areas of “Persina” Nature park and “Kalimok – Brushlen” Protected area will be established in the course of implementation of the *Institutional Establishment, Capacity Building and Integrated Management Planning for Protected Wetland Areas* Project under the PHARE National Programme.

IX. Activities, Terms, and Implementation Costs

1. Protection and Restoration of Floodplain Forests

Activities	Year	Quantity (ha, kg)	Expenses (BGN/ha)	Expenses ( )
1.1. Protection of existing floodplain forests of local species				
Revision of the Forestry Plans	2003	6 260 ha	1.0	3 200
1. 2. Restoration of former floodplain forests				
Selection of seed vessels	2003	6 260 ha		2 560*
Collection of seeds	2003-2005	4.500 kg	5.0	11 500
Production of saplings	2004-2007	1.5 mln. pieces	0.2	153 390
Preparation of areas (Soil cultivation) **	2004-2007	230 ha	2 500.0	294 000
Afforestation	2004-2006	230 ha	740.0	87 000
Seed planting	2004-2007	45 ha	1 000.0	23 000
Replenishment of cultures	2005-2007	230 ha	200.0	23 500
Cultivation	2004-2008	230 ha	1 750.0	205 850
Total		**275 ha**		**804 000**

* *Quercus longipes, Ulmus campestre, Ulmus laevis, Ulmus minor, Fraxinus oxycarpa, Populus alba* (veg.-gen.), *Populus nigra* (veg.-gen.), *Salix alba, Morus nigra, Pyrus communis, Malus silvestris*

** A target has been set to decrease the expenses for soil cultivation by using the natural regeneration of areas or available representatives of local tree species. The accomplishment could take place during the implementation of the activity.

2. 2. Restoration of the Hydrological Regime of Priority Habitats*

Activities	Year	Quantity	Expenses ( )
Feasibility studies of internal channels			
Mapping (GIS)	2003		
Status check in the field	2004	218.72 ha	2 300
Restoration of filled up or partially blocked internal channels			
Vardim island	2004		25 600
Other internal channels	2004-2006	218.72 ha	255 700
Total			**283 600**

* The wetlands restoration on Belene island, which will be funded by the GEF/WB *Wetlands Restoration and Pollution Reduction* Project is not included in the table.

3. Optimisation of the Protected Areas System*

Protected areas designation	Area (ha)	Proposal for designation	Terms of reference for the management plan	Management plan	Expenses ( )
"Stariya dub" PA (Vardim island, KM 541-547, Svistov SFU)	490.4	2003	2003	2004	18 650
"Ibisha" NR (Ibisha island, KM 716-720, Lom SFU)	36.9		2003	2004	10 650
Western part of Baikal island (across Baikal village KM 640.5-642.5, Pleven SFU)	106.6	2003	2003	2003-2004	15 950
Eastern part of Aleko island (KM 468-474, Rousse SFU)	271.3	2003	2003	2004-2005	15 950
2 slands, KM 975-976, Vidin SFU**	8.6	2004			1 330
3 islands, KM 777-779, Vidin SFU**	41.8	2004			1 330
Dovlek island, KM 764-766**	26.7	2004			1 330
Island to the east of Ibisha KM 713-715, Lom SFU**	40.6	2005			1 330
2 islands between Kozloduy and Oryahovo KM 698-701, Oryahovo SFU**	23.0	2005			1 330
A small island near Byala, near Batin island KM 528, Byala SFU**	16.0	2006			1 330
3 islands near Silistra, KM 382-385, Silistra SFU**	45.1	2006			1 330
"Pozharevo" PA, KM 424-428, Tutrakan SFU**	264.7	2006			1 330
Total	**1 371.7**				**71 840**

* The Management plans for Persina Nature park and Kalimok – Brushlen Protected Area, which will be funded by the *Institutional Establishment, Capacity Building and Integrated Management Planning for Protected Wetland Areas* Project under the PHARE National Programme , are not considered in the table.

** Management plans for these areas will be developed after 2006.

Newly engendered islands

Activities	Year	Expenses ( )
Making a data base (GIS) of new islands	2003	1 350
Description of new islands, including their boundaries	2003	6 100
Travelling and daily expenses for the above activities	2003	10 200
Total		**17 650**

4. Introduction of Practices for Sustainable Use of the Danube Islands

Activity	Years	Quantity	Expenses ( )
Development and publishing of a guide for good forestry practices	2003	500 copies	5 000
Introduction of good forestry practices on the Danube islands	2003-2004	2 seminars	1 540
Certification of forest plantations on the Danube islands	2003-2004	6 260 ha	6 400
Total			**12 940**

5. Building Capacity for Sustainable Management on the Danube Islands through Training of Regional and Local Bodies*

Subject	Organisation of the training	Year	Expenses ( )
Methods for floodplain forest restoration and management**	1-week study visit to Germany for 3 groups of 10 people ***	2003	39 000
Protected areas management****	1-week training on the spot for the same 3 groups plus 10 more participants (NGOs and local authorities)	2003	4 000
Total			**43 000**

* The table does not take into consideration the activities for institutional capacity building for the protected areas management of the *Institutional Establishment, Capacity Building and Integrated Management Planning for Protected Wetland Areas* Project under the PHARE National Programme

** Training topics: Methods for the conversion of poplar monocultures to floodplain forests of native species; Different ways of management (e.g. group selection); Economic aspects of poplar industry and natural floodplain forests

*** Participants:
Group I – RFB Berkovitza 2, SFU Vidin 2, SFU Lom 2, SFU Oryahovo 2, RIEW Montana 1, GB 1;
Group II – RFB Lovech 1, SFU Nikopol 2, FE Pleven 2, RFB Veliko Turnovo 1, FE Svishtov 2, RIEW Pleven 2;
Group III – RFB Rousse 1, SFU Byala 2, SFU Rousse 2, SFU Tutrakan 2, SFU Silistra 2, RIEW Rousse 1.

**** Training topics – Biodiversity, Biomonitoring, Protected areas, Alternative uses

6. Scientific research and monitoring*

Scientific Research

Subject	Year	Expenses ( )
1. Fishery – Identification of the fish reproduction potential in the internal channels and on island banks with pioneer vegetation – Field research through questionnaires (1200 selected fishermen) and marker catches	2003-2004	4 000
2. Genetic research on tree species (identification of genetically pure representatives to be used for reproduction material)	2003	5 300
Total		**9 300**

Monitoring

Subject	Measure (area, quantity)	Year	Expenses ( )
Development of afforested areas *Description of growth of the saplings, description of harms caused by animals gnawing the bark, description of the growth in length and of the regeneration of other plants*	10 areas of 0.5 ha	2004	2 000
Development of seed planted areas *Description of seed planted areas with and without fence*	2 areas of 0.5 ha	2004-2007	700
Development of bare areas (after seed dressing) *Variants with /without fence and with /without soil cultivation*	**4 areas of 0.5 ha**	**2004-2007**	**2 000**

Subject	Measure (area, quantity)	Year	Expenses ( )
Development of naturally regenerated areas *Variant without structural afforestation with/without fence, variant with structural afforestation with/without fence,variant in natural forests at growth sites for hardwood forests with/without fence*	6 areas of 0.5 ha	2004-2007	7 800
Research on Amorpha *Comparative research on the presence, development and areas with or without soil cultivation and in closed natural forests. Development and application of different methods of fight against Amorpha.*	4 areas of 0.5 ha	2004-2007	4 000
Description of the herbaceous story and its development	1 500 ha	2004-2007	4 000
First inventory of areas and plantations adjacent to them	1 500 ha	2004-2007	6 700
Additional studies		2004-2007	5 100
Assessment, analysis and data processing		2004-2007	13 500
Technical equipment *Hardware, software, motor-delta glider and other equipment*		2004-2007	30 000
Publishing of gained experiences (1 brochure, 1 leaflet)		2006-2007	18 000
Monitoring of birds and protected plants	28 islands	2004-2007	13 000
Total			**103 000**

* The activities for the establishmen of a monitoring sistem under the *Institutional Establishment, Capacity Building and Integrated Management Planning for Protected Wetland Areas* Project of the PHARE National Programme are not included here.

The total implementation costs of the present Action Plan are 1 345 330 euro. This amount does not include the implementation costs for the activities foreseen under the GEF/WB *Wetlands Restoration and Pollution Reduction* Project and the *Institutional Establishment, Capacity Building and Integrated Management Planning for Protected Wetland Areas* Project of the PHARE National Programme Project.