Currently there is no tool that quantifies the possible impacts of Community policies on biodiversity in Europe.

The **BioScore project** is responding to this need by developing a database that integrates species-pressure relationships with distribution data.

BioScore quantifies policy impacts on biodiversity

BioScore

ECNC
european centre for **nature conservation**
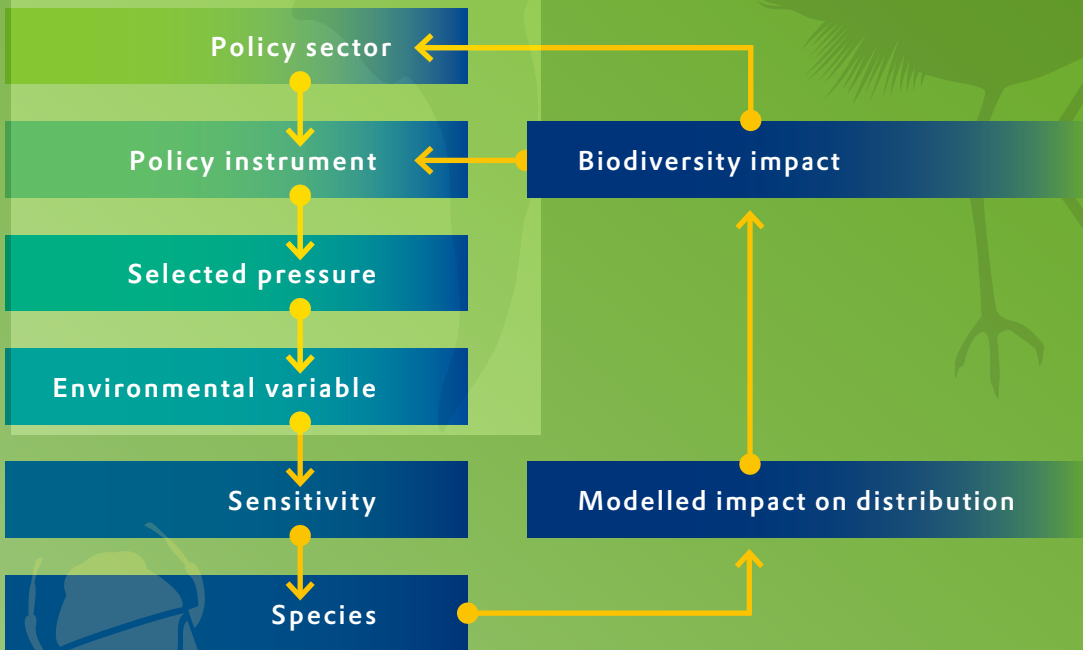
What does BioScore want to achieve?

BioScore aims to develop a cost-effective tool that allows for monitoring and assessing the impacts of key drivers and pressures from Community policies on biodiversity (species) with the ultimate aim of helping to halt the loss of biodiversity in the EU by 2010.

BioScore will:

- build a European database with ecological preferences of individual species in relation to individual sectoral pressures and selected Community policies;
- apply the tool for assessing the impacts of EU policies on biodiversity;
- apply the tool for analysing the effectiveness of European policy responses;
- apply the tool for modelling European-wide scenarios for selected drivers;
- integrate the tool into an existing common monitoring framework to assess the impact of selected pressures on biodiversity;
- propose incentives for a wide uptake of the tool.

How does BioScore achieve this aim?

BioScore follows a unidirectional approach to relate individual policy measures to species distribution through their sensitivity to related pressures. A feedback loop ensures that the outcome helps decision making.

Policy sector

Policy instrument

Selected pressure

Environmental variable

Sensitivity

Species

Biodiversity impact

Modelled impact on distribution

Policy sector

The BioScore project considers those policy instruments that have a direct or indirect impact on biodiversity and cover key policy areas such as agriculture, forestry, energy, transport, environment and urban development. BioScore will contribute, among others, to the implementation of the recommendations and guidelines in all relevant work areas of the recent EC Biodiversity Communication.

Pressures

From the text of 26 selected Community policy instruments, those pressures that have a potential impact on biodiversity (either positive or negative) were extracted. This led to a list of about 260 pressures that have been clustered into 14 main pressures on biodiversity for which data exist at EU level (EEA countries), such as land use change, eutrophication, deforestation, etc.

Environmental variables and sensitivity

To quantify the impact of pressures on biodiversity, measurable parameters are required. Therefore, the pressures considered have been linked to measurable environmental variables for each of the taxonomical groups under consideration.
This linkage between environmental variables and pressures provides the tool to relate sensitivity of a species (group) to a pressure and policy instrument. In this way species will be assigned values between -1 (not applicable) to 3 (very sensitive) according to their sensitivity to a certain environmental variable.

Species

The species groups that are covered in BioScore are butterflies and dragonflies, freshwater fish, aquatic macroinvertebrates, waterbirds and breeding birds, vascular plants, mammals, amphibians and reptiles.
In total 1200 species will be considered and integrated in the BioScore database, covering a wide variety of organism groups and representing European biodiversity in general.

Taxonomical group	Plants	Birds	Butterflies
Total number of species occurring in Europe	15974	526	576
Enough baseline (ecological) information available	3000	478	152
Additional reduction following specific criteria	700	154	77

The first criterion to be applied to reduce the number of species was whether ecological data were available for the species concerned. The second was whether the species relate to the pressures via environmental variables; also specific filters have been applied per species group (e.g. abundance and geographical distribution of species).

Applications of the BioScore database

The BioScore project will be able to identify which species are likely to benefit and which species might be negatively affected by the stimulation of a certain policy measure. BioScore will be able to locate, by using existing spatial data, the areas where these species will occur in Europe at biogeographical and national level.
BioScore aims to produce answers in the following format
'**If your policy change results in a decrease of X (environmental variable), this results in a likely increase of A species and a likely decrease in B species (of which Y (number of species) are strictly protected). Areas of relatively high risk are located in Z (location).**'

Bioscore will allow policymakers to assess the possible impacts of policy measures they are taking.
It will enhance decision making to the benefit of Europe's biodiversity.

Fish	Amphibians	Reptiles	Mammals	Macrobenthos
305	88	217	295	
108	20	30	50	
108	20	30	50	40 fam

Three case studies are carried out at regional level:

A **retrospective impact assessment** to test the BioScore tool for assessing assumed negative impacts on biodiversity from a selected EC policy. It is intended to focus on pressures such as afforestation and habitat fragmentation due to transport infrastructure.

Retrospective effectiveness assessment to test the BioScore tool for assessing the assumed positive impact on biodiversity from a selected EC policy. Specific attention will be paid to positive effects from reduced load levels of air pollution coming from agriculture and transport. In addition, the effectiveness of the implementation of the Water Framework Directive in relation to water quality will be assessed.

Prospective impact assessment to assess biodiversity impacts for selected scenarios. For example, the impacts of biofuel production on biodiversity in Europe will be studied.
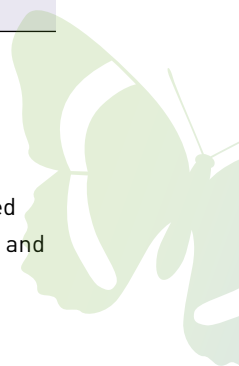
Initial results on biofuel impacts

The preliminary results of a test on biofuel policy revealed that potentially 44% of the species considered will be negatively affected and that 7% of species might benefit from the growth of bioenergetic crops in Europe (assuming increased woody plantations on abandoned and agricultural land). The effects will be different per biogeographical region; for example, for butterflies approximately 38% of the species considered will decrease mainly in the Mediterranean region and about 12% of the species will increase mainly in the boreal region.

These results will be validated and scrutinized and should be regarded as indicative only.

Butterflies and biofuels

Percentage increase
- 6
- 9
- 10
- 11
- 13
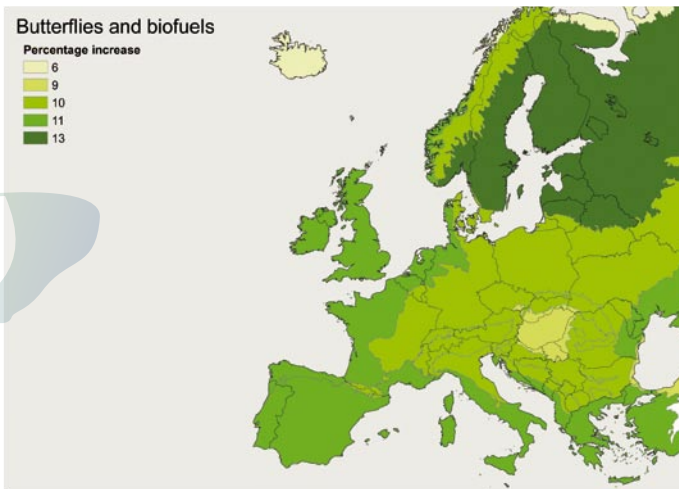
Relative proportion of butterflies **increasing**/**decreasing** by biogeographical region due to biofuel production.

Butterflies and biofuels

Percentage decrease
- 12
- 25
- 29
- 31
- 34
- 36
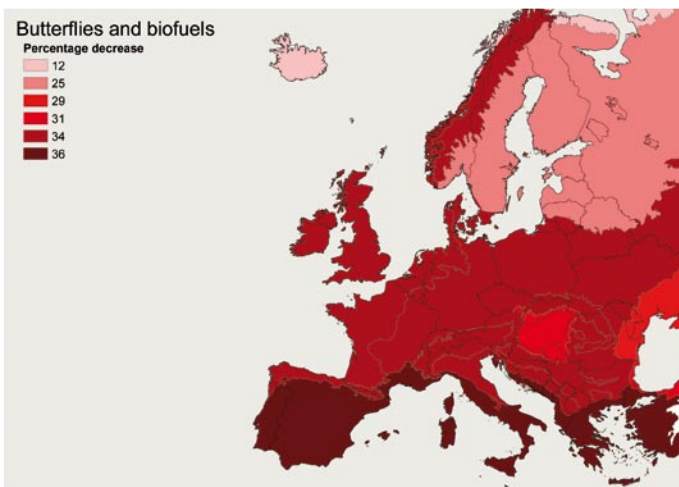
Partners

- **ECNC** - European Centre for Nature Conservation (Coordination)
- **MNP** - Netherlands Environmental Assessment Agency, the Netherlands
- **INBO/BC Europe** - Research Institute for Nature and Forest/Butterfly Conservation Europe, Belgium
- **WI** - Wetlands International
- **Alterra** - Green World Research, the Netherlands
- **NINA** - Norwegian Institute for Nature Research, Norway
- **UniRoma1** - University of Rome, Department of Animal and Human Biology, Italy
- **EFI** - European Forest Institute
- **EKBY** - Greek Biotope/Wetland Centre, Greece

The **BioScore Steering Committee** includes representatives from policymaking, international NGOs, data providers, science, and related European projects.
It advises the project team on its direction, reviews results and ensures sufficient linkages with other initiatives. The Steering Committee is an essential tool in the BioScore science-policy interface.

More information

Please visit the BioScore website at **www.ecnc.org/Bioscore/**
or contact the Project Coordinator, **Ben Delbaere (delbaere@ecnc.org)**

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