Compensation of loss in natural habitats and species
Guidance for naturalists involved in Habitats Directive Art. 6(4) implementation, and in other environmental procedures

Introduction
In general, the word „compensation” means balancing one action (or its effects) with another action. In nature conservation, compensation means balancing the negative effects in the environment with other activities that improve the state of the environment and restore its proper functions.

Avoid misunderstanding:
Mitigation of the environmental impact is not compensation. Mitigation should be always implemented in case of any environmental impact in order to minimize or avoid adverse effects. Compensation should be applied as the “last line of defense” to avoid environmental impacts.

<table>
<thead>
<tr>
<th>mitigation:</th>
<th>compensation:</th>
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<tr>
<td>- Measures, which aim to minimize or even diminish negative impacts on a site where they are likely to arise as a result of implementation of a plan or a project,</td>
<td>- Measures intended to offset negative effects of a plan or project</td>
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<td>- Is integral part of a project,</td>
<td>- Is independent from the project</td>
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<td>- Is related to impacts,</td>
<td>- Is related with habitat and nature loss</td>
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<td>- Has no meaning without a project (without a project there would be no impact to mitigate),</td>
<td>- Has independent meaning (would be also welcome without the project),</td>
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<td>- Regarding Natura 2000: the possibility to mitigate and reduce impacts to non-significant level may be the argument for the authorization of the project</td>
<td>- Regarding Natura 2000: the possibility to compensate negative impacts significantly, normally cannot be the argument for the authorization of the project (exception: Art. 6(4): IROPI and no alternative)</td>
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examples: animal passages, acoustic screens, sound barriers, planting noise and pollution absorbing assets, selection of the least harmful work time, construction work alternatives, building design modifications, the use of pro-environmental technologies, modifications and limitations in the functioning of the project (e.g. road speed limit)

Environmental compensation (compensatory measures):
- Must be implemented in case of any projects that disturb Natura 2000 site and must be approved according to Art. 6(4) of the Habitats Directive – in the absence of alternative solutions and presence of imperative reasons of overriding public interest. In this case, there are strict rules: compensation must ensure that the overall coherence of Natura 2000 is protected. This is the so-called Natura 2000 compensation.
May be implemented as one of the tools for achieving the targets: “maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest” or “to maintain the population of the species referred to in Article 1 at a level which corresponds in particular to ecological, scientific and cultural requirements, while taking account of economic and recreational requirements, or to adapt the population of these species to that level”, taking under consideration “High level of environment protection”, required by Art. 191 of the Treaty on the Functioning of the European Union. Such general environmental compensation may be applied in case of any plan or project also outside the Natura 2000 network. National legislation may create special rules and requirements to be applied. Similarly, environmental compensation may be a tool for achieving national targets for environment protection, according to national legal rules.

Technically, similar measures are often used as remediating measures in case of environmental damage.

**Avoid misunderstanding:** Remediation terminology (Environmental Liability Directive) is specific and not the same as in the Habitats Directive!

**Complementary remediation = measures “similar to ecological compensation”** is applied where the damaged natural resources and/or services do not return to their baseline condition. The purpose of complementary remediation is to provide similar level of natural resources and/or services at an alternative site as would have been provided if the damaged site had been returned to its baseline condition. Where possible and appropriate, the alternative site should be geographically linked to the damaged site, taking into account the interests of the affected population.

**Compensatory remediation** = measures undertaken to compensate for the interim loss of natural resources and services pending recovery.

**Good compensation standards**

**Golden rule: The best solution is no compensation** (because no compensation is needed)

I.e., in the investment planning, it is primarily needed to avoid environmental impacts that would require compensation. Compensation planning should be treated as the "last step in the protection of the environment" – an exquisite, rather than a standard solution. All other terms of compensation – including the one formulated below - must be interpreted in the light of this fundamental rule.

Compensation cannot be used for „making investments easier”, for authorizing investment without „appropriate assessment”, for authorizing investment in case of no overriding public interest, nor for selecting an alternative destruction for Natura 2000 sites.

**GOOD COMPENSATION MUST BE:**

1. **Based on appropriate impact assessment**

An obvious condition for the proper compensation plan is the right identification of what exactly is to be compensated – i.e. the precise identification of the project’s environmental impact.

In Natura 2000: Art. 6(4) of the Habitats Directive may be applied only after the fulfillment of „appropriate assessment” according to HD Art. 6(3). Natura 2000 compensation cannot be authorised, and have no sense being considered before:

- the significant negative impact is assessed (the precise impact must be known),
- the imperative reasons of overriding public interest are indisputable,
- the lack of alternatives is indisputable,

2. **Real, non-paper**

Only real actions, followed by real improvement of the environment, may be counted among compensatory measures. Compensatory measures may include for example:

1. Habitat reclamation elsewhere in the Natura 2000 (provided that it is feasible).
2. Improvement of the remaining resources of natural habitats at the Natura 2000 site (including rehabilitation of the ecosystems - for example, to restore the natural dynamics of dune systems and to create a "corridor of free migration" along a river).

3. Habitat restoration in another Natura 2000 site, or in a place to be included in the Natura 2000 network (provided that its function in the Natura 2000 network will be restored in similar way).

4. Creating new species habitats in the Natura 2000 network and the transfer of species to such habitats.

5. Restoring ecological connectivity of the species and habitats and removing barriers to species (e.g. building passages)

6. Reintroduction of species into sites where the species have previously disappeared (provided the scientific soundness of such a re-introduction)

7. Restoration and strengthening of the population of the species

8. Improvement of species’ food base to improve the state of its population

9. Within the resources of the natural habitat, creation of areas of high ecological quality (including zones with restriction to normal use). For example, creation - by any legal tools – of not managed zones in forests; zones excluded from bird hunting, etc.

10. Reduction of other threats for threatened species

Research, preparing expertises, nature monitoring, ecological education – should not be considered as compensation. Also, payment for nature compensation should not be considered as compensation (see ECJ judgement C-209/04) till the money are used for real compensatory measures.

New protected areas as compensation?
Designation of a new protected area may be an element of compensation measures if followed by positive change in the way of management or use of land. For example, a compensation measure for the loss of beech forest (natural habitat 9130) may be an exclusion of a part of the forests from the normal management and establishment of the non-managed strict reserve. However, designation of a "zone of protected landscape", which does not change the normal practice in the management of natural habitats, should not be treated as compensation. The designation of "additional" Natura 2000 site is sometimes accepted as part of compensatory measures - but it should not be the only measure. Following the designation of the site, appropriate actions for its conservation must be planned and implemented.

3. Adequate to loss (in-kind)
Compensatory measures should restore the same natural feature, which is lost as a result of the compensated activity. If a fragment of the meadow has to be destroyed, then compensation must fulfill the restoration of a similar meadow. If the habitat of a toad species is destroyed, the compensation should improve the species' living conditions and create new habitat for that species. If a wetland being a resting place for birds on their flight route is demolished, the subject of compensation must be to create another wetland area that will take over this role. Destroying a wetland must not be compensated by planting forest!

Natura 2000 compensation is restricted by legal conditions - it must ensure "the overall coherence of Natura 2000." Compensation must either restore the role of the site within the Natura 2000 network or create adequate conditions for the replacement of the site with the same role on a different area. In this case, there are no exceptions from the rule “to restore the same feature as destroyed”.

However, keep in mind that the restoration of habitat is not just an artificial reconstruction of its structure. The trick - and the main difficulty - is to restore proper functioning of the mechanisms of the ecosystem. For example, if the compensation regards dune habitats, it is not only about refilling the areas with sand. To restore the habitat successfully the sand dunes should be shaped by aeolian processes since the succession and diversity of the vegetation mosaic are the results of this process. This is the reason why compensation is a very difficult activity; in many cases, its possibilities are significantly limited.

As an exception, where there is no possibility to use in-kind compensation measures, the use of off-kind compensation can be considered. For instance, offsetting ecological functions that have been lost, but carried out by other types of natural resources (e.g., in exchange for the destruction of forest, which purifies water, analogous wetland function’s retention can provide solution). Off-kind
compensation can be used as additional compensation measure extending the fundamental in-kind compensation, however, it should not be the only compensation measure particularly in case of Natura 2000 compensation.

4. **Proportional to loss (as a rule = oversized)**
The quantitative extent of environment compensation must be at east adequate to the compensated loss. However, in practice, the result of compensation never achieves the same natural quality like the original ecosystem or biotope. The compensation is always associated with some risk of failure. Therefore, in practice, incomplete quality is always compensated by the amount. The surface on which habitats are restored must be larger than the site of the habitat that will be lost - only then the combined effect will be able to offset the losses.

In Poland, the below „oversizing ratios” were recommended;

<table>
<thead>
<tr>
<th>Conservation Status of feature in Biogeographic Region</th>
<th>Quality of lost resources</th>
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<tbody>
<tr>
<td>FV</td>
<td>U2 (low)</td>
</tr>
<tr>
<td>U1 Or feature on the national red list</td>
<td>3-5</td>
</tr>
<tr>
<td>U2 Or feature with status EN, VU on the national red list</td>
<td>5-10</td>
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$x \times 0.1 \times \text{number of years to full compensation functionality}$

5. **Not destructive for other nature features**
Compensatory measures cannot result in the destruction of other natural values. Afforestation of calcareous grasslands, “restoring bog forest” by planting pine trees on raised bog, build small water reservoir flooding alkaline fen, etc. are not acceptable compensatory measures!

Compensatory measures must be properly assessed from the environmental impact’s point of view. Compensatory measures in Natura 2000 sites should not be considered as “project directly connected with or necessary to the management of the site” and should not avoid assessment according to Art 6(3) of the Habitat Directive.

6. **Implementable**
The project of the compensation must ensure that compensatory measures are feasible in terms of legal, technical and financial aspects. In particular, action must be agreed with the owners of the land on which they will be implemented. This principle cannot be regarded as limitation for the compensation plan. It cannot be a priori assumed that only those compensatory actions should be planned, for which the compensator has a legal title of. On the contrary, first, the necessary forms and the scale of compensation are planned. Afterwards, it is the compensator's responsibility to obtain legal title to the land and the necessary arrangements and permits. The extent of the compensation cannot be limited due to legal or ownership difficulties.

7. **Above normal practice and above obligations**
Any actions, which "have taken place regardless the project’s status" cannot be recognized as compensation. Thus, any action arising from pre-established plans and programs fulfilling different purposes, or any action within the "normal management" cannot be considered as a compensation. The activities that perform obligations arising from the directives cannot be regarded as compensation.

For example, actions that protect the areas of reproduction and species protected from accidental damage cannot be classified as compensation - such protection falls within the state's obligations under the law (in the case of species of Annex IV of the Habitats Directive and the Article 12 of the Directive). Also, actions protecting Natura 2000 sites from the deterioration cannot be regarded as compensation since this should be fulfilled irrespectively according to Art. 6(2) of the Directive.
8. Implemented on time
The basic principle is that compensation needs to precede the compensated losses.

In outstanding circumstances, some exceptions from the general principle are allowed, such as in situations, in which obtaining the full functionality of compensation requires a long time. For example, for the renaturalization of forest ecosystem to reach full functionality significant time is needed. Even if alien species are eliminated from the forest habitat and dead wood resources are created artificially, development of biological diversity needs at least a dozen year - and there is no way to shorten this time. However, in general, compensatory measures must always be implemented before the occurrence of adverse effects (i.e., before investment).

9. Properly located
Proper compensation not only restores certain natural resources (species or natural habitats), but also their functions in space. Location of compensatory measures must provide a "restoration of functions".

The general principle is that compensation should be located as close as possible to the place affected by the negative impacts. In theory, compensation can be classified as “in-site” compensation, i.e. in the site affected by the impact, and „off site” compensation at another site – underlying in-site compensation, which (and in-kind, see above) should always be treated as the primarily preferred solution.

In the case of Natura 2000 compensation, if compensatory measures are located in a place not established as a Natura 2000 site, the site must be included in the Natura 2000 network. An exception can apply only to those actions, which compensate connectivity disturbance among Natura 2000 sites (deterioration of the quality of ecological corridors connecting sites).

10. Permanent
It is necessary to ensure that the effects of environmental compensation will be permanent. This requires adequate procedural guarantees. For example, if compensation is performed on someone else's (foreign) land, it is necessary to guarantee the right to the maintenance of the effects of compensatory measures without any limitations in time (e.g. acquisition of rights to land by purchase or expropriation, or at least acquiring rights). If the compensation has to rely on "exclusion from the economic use", it must be somehow ensured that such exclusion will be permanent.

In many cases, it is necessary to continue the particular conservation measures in order to maintain the effects of compensation. For example, if as a result of compensation, species-rich fresh meadows are restored (natural habitat 6510), it is necessary to mow them regularly in an appropriate way.

11. If possible, diversified
Even the most carefully planned and based on the best ecological knowledge, compensation can never reach 100% likelihood of success. Therefore, there is good practice to use for each species or habitat, not only one single compensatory measure, but the package of different measures as wide and diversified as possible.

The extent of this package – similarly to the “compensation oversizing coefficient” - should depend on the probability of success of individual actions and on "significance of loss "(loss of rare and endangered species requires a greater margin of safety than the loss of common species), and on the quality of resources that will be lost.

For Natura 2000 compensation, see also:
Techniques of ecological compensation

Environmental compensation should always be an exceptional action, undertaken only when unable to avoid or minimize negative effects to an insignificant level. Therefore, the use of environmental compensation will never be substantial. Every case of compensation must be individually planned. Therefore, it is impracticable and impossible to propose any detailed standards of compensation measures.

Techniques that can be used in the compensation planning are specific to particular types of natural habitats and species, and even have to be specific to local situations. Naturally, the possibility of designing and implementing effective compensation in relation to different habitats and species differ. While there are many good examples of successful creation of new habitats for wetland birds, or for toads’ reproduction, for many species and habitats effective techniques for restoration are not known.

Designing proper compensation is based on the rapidly developing applied ecology, which deals with restoration and reconstruction of ecosystems and habitats of species – this is the so-called ecological reconstruction (restoration ecology). The important achievements of this field of ecology are held every two years in the European Conference of Restoration Ecology (2006 - Greifswald, 2008 - Ghent, 2010 - Avignon). The world-wide operating Society of Ecological Restoration (www.ser.org) has a dynamic section in Europe. Numerous examples are depicted in scientific journals, e.g. in the Ecological Restoration, Biological Conservation and Conservation Biology. Many examples of rivers restoration can be found at River Restoration Centre (www.therrc.co.uk) or European Centre of River Restoration (www.ecrr.org). Several cases of good projects in the field of ecosystems’ restoration have been implemented with the support of the financial mechanism LIFE, which data are available on www.ec.europa.eu/environment/life.

Non-compensables

In some cases, adequate compensation is simply impossible. They occur, in particular, in the following situations:

- Endangered habitats and endangered species, whereas the location is absolutely crucial for the preservation - this includes key localities of those species and habitats, which – in the biogeographic region or in the country - are generally endangered and threatened (evaluation of U1 or U2 in the “art 17 report”, or EN or VU on the national Red List).

- Such habitats or species, which loss cannot be effectively compensated. This may be due either to the basic impossibility (cannot restore a bog effectively, since its growth requires a few thousand years), or to the lack of knowledge on proper restoration ecology of the species or habitat type. For example, we cannot possibly restore the original state of limestone springs, or natural alkaline fens (in theory, it might be possible, but we cannot effectively do it).

- The techniques of restoration or improvement of the species and habitats are known, but the space is simply not available. For example, we can theoretically reproduce/produce bog woodland - but it has to be done by afforestation (=destroying) of the bog, which is also a protected habitat for wildlife. In practice, the known method "to create bog forests" are not to be used as compensation because their use would cause unacceptable harm to the protected resources of other elements of nature.

Because there is no guarantee of an effective compensation, such patches of habitat and species in project planning should be treated as inviolable (“taboo”), and the destruction has to be avoided by all means. As a rule, their size and distribution in space are such, that such avoiding is not very difficult.

For example, in Poland, the loss of the following elements of nature would be irreparable and impossible to compensate:

- Active raised bogs (7110 habitat),
- Alkaline bog (7230 habitat) and calcareous fens (7210 habitat) in good condition (not transformed significantly by man),
- Limestone petrifying springs (7220 habitat),
- Lobelia lakes (3110 habitat) preserved in good status, with abundant populations of typical species,
- Typical dystrophic lakes (3160 habitat) and adjacent complexes of mires (7140 habitat),
- Complexes of high-mountain protected habitats,
- Upland and montane siliceous and calcareous screes (8150, 8160 habitats),
- Chasmophytic vegetation on rocky slopes (8210, 8220, 8230 habitats)
- Caves not open to the public
- Mature, old-growth, non managed forests (representing habitats 9110, 9130, 9160, 9170, 9180, 9190, 91E0, 91F0), still having natural characters,
- Calcareous beech forests (9150 habitat) with orchids,
- Ravine forests (9180 habitat) with sycamore or linden
- All populations and habitats of very rare species (species having < 30 localities in Poland, or species assessed as EN on the national red list),
- All habitats and species, which numbers were reduced so that they are "on the verge of extinction" (capercaillie, black grouse).
This list is not exhaustive.

Approved examples of compensation

👩‍💻 A20 motorway Szczecin - Stralsund - Lübeck, Germany. The construction of the highway was considered necessary by the German government for the development of the region of Mecklenburg-Vorpommern, a region with a high degree of unemployment and economically undeveloped. The highway was designed to cross a Natura 2000 SPA and SCI, designated along the Peene river valley.

After analyzing various possible places to pass through the valley, a spot was selected, where the impact on the Natura 2000 site will be minimal (other than the originally preferred one by the German government). The following measures were implemented to minimize the effects: the highway on a long viaduct over the valley, noise barrier screens, prevention of run-off from polluted water into the river, and technologies minimizing habitat damage during building the pillars. Neither natural habitats nor bird habitats were directly affected, however, the highway crossing the valley will be an obstacle to birds migrating along the valley, and will cause an indirect impact on natural habitats.

As a compensation measure, natural habitat restoration and creation of suitable habitats for birds on over 100 ha were implemented. In 1995, the European Commission approved the construction of the highway and the proposed compensation measures. The highway was open in 2005.

👩‍💻 Bothnia railway in Sweden. A high speed line from Nyland to Umeå (the Bothnia Railway) was proposed as part of the Swedish railway network. The railway was regarded as very important from the perspective of regional policy. It was expected that its construction will cause a transfer of transport streams: from the very harmful road and air transport to the less environmentally damaging rail. On the last section, near Umea, the railway must cross the Natura 2000 SPA and SCI of the Umeälven delta. The alternative routeto avoid the Natura 2000 areas did not provide the desired economic effect - the traveling time would be longer by 10-20% despite the similar construction costs. This would reduce the attractiveness of the rail line, which may result in failure to achieve the desired effects.

At the Natura 2000 site, the project will destroy 13 hectares of valuable habitat 9030* (in Sweden approx. 11000 ha). In addition, there will be indirect impacts on the forest ecosystem by fragmentation and the emergence of "edge effects". Valuable transition mires will be crossed by wide-span viaduct and will not be immediately destroyed, but some impact may occur indirectly. Molinia meadows will not be directly affected, but noise can deplete the associated avifauna, which should be considered as indirect impact. Birds may be subject to the influence of noise moreover, the railway will also be perceived by them as a local barrier fragmenting their feeding habitats.

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Compensation for these impacts will be:

- Exclusion of 160 ha of boreal forest from normal forest management and its designation as a strict nature reserve with non-management approach,
- Exclusion of further 112 ha of secondary forest "with a high regenerative potential" from normal forest management and its restoration by thinnings and deadwood resources creation,
- Restoration of 120 hectares of wetlands - floodplains and coastal meadows,
- Ensure (through contracts with farmers) 10 ha of feeding grounds for birds (by leaving non-harvested grains).

During the implementation of compensation, it was necessary to solve the problems associated with the presence of birds near the airport in Umeå (the only land suitable for creating habitat for birds were located near the airport). These areas of compensation, which lay outside the Natura 2000, have been incorporated.

Full documentation of compensation is available on [http://www.botniabanan.se/](http://www.botniabanan.se/).

Despite the approval of the Commission, and a good compensation program, the Swedish court recently questioned the correctness of the authorization of the investment.

Reservoir La Brena II in Spain. The water reservoir on the river Guadiato (tributary of the Guadalquivir) in Andalusia, near Cordoba, was designed as an area to provide drinking water and water for industry and agriculture. It is part of "the Spanish National Water Management Plan."

In the opinion of the Spanish Government, a reservoir is the sole solution to achieve the goal to provide sufficient water resources. Reservoir will flood some 630 hectares of the Natura 2000 SCI Sierra de Hornachuelos (approximately 1% of the area). The most serious impact is the reduction of the Iberian lynx habitat and the habitat of the imperial eagle and the destruction of some habitat types of Annex I of the Directive.

The package of compensation measures, worth 28 million Euros (about a quarter of the cost of the construction of the dam) included:

- Purchase of 2,134 acres of land from private owners and their management to constitute suitable habitat for lynx (improving habitat for rabbits, followed by increase in the number of rabbits - potential food for the lynx, mosaic afforestation, restoration of woods and avenues), the compensation area was included in the Natura 2000,
- Improving the quality of ecological corridors linking isolated populations of lynx in Spain,
- Improving the quality of the habitats of birds (eagle, imperial eagle, southern black stork),
- Rebuilding of power line dangerous for birds,
- Improving the quality of habitat for bats.

The implementation of the compensation involved the key academic institutions in Spain, dealing with the issue of protection of the Iberian lynx. However, the whole Spanish National Water Management Plan was questioned by national and international (WWF) environmental organizations, as irrelevant and highly destructive to the environment. This major controversy, concerns the merits of the granting consent. The compensation program is considered appropriate by WWF, but it is noted that it does not remedy the negative effects of the isolation of the lynx’ two local populations. Furthermore, these activities were planned to be implemented under the protection of the lynx project, therefore, they should not be treated as compensation. Nevertheless, the European Commission in 2004 expressed a positive opinion on the investment, recognizing the existence of the necessary reasons of overriding public interest and the lack of alternatives. The Commission also issued a positive opinion on the compensation program.

Airport in Baden-Baden. The planned expansion of the airport in Karlsruhe / Baden-Baden has been recognized as necessary reason of overriding public interest. The expansion was not possible without disturbing surrounding Natura 2000 sites. In exchange for the destruction on approx. 2 ha of Corynephorus grasslands (2330) and the temporary decline of the conservation status of further 0.5 ha, 45 ha of new grasslands of this type was established in the form of re-creation. In exchange for the loss of 0.02 ha of heath (4030), 2 hectares of heathland was restored. In
exchange for the loss of 3 ha of Nardus grasslands (6230), 6 ha was re-created (there was no suitable place for bigger area). In exchange for the loss of 3 ha of meadows (6510 habitat), 10 hectares of 6510 habitat was restored and another 10 hectares’ status was improved. European Commission has approved the project and the compensation measures.

Project Mose - Venice flood protection. In 2003, after long debates, Italy started a project for flood protection by an integrated system consisting of mobile gates able to isolate the lagoon from the Adriatic Sea when the tide reaches above an established level. The project is called Mose (Modello Elettromeccanico Sperimentale - Experimental Electromechanical Model - also sounds like Moses in Italian). Venetian Lagoon is a Natura 2000 SPA, in which there are three smaller SCI sites.

Construction of a gate will permanently destroy a 1 hectare of dune habitats and will cause the temporary destruction of 1.39 ha. As compensation for the destruction, the creation of 34 ha of natural habitats was provided - creating artificial salt marshes of 10 ha, 10 ha of tidal areas, renaturalised dune vegetation on the surface of 12 ha, and transplantation of natural vegetation in the offshore area of 2 ha. The compensation site has been included in the Natura 2000 habitat site.

Controversy concerning the correctness of the impact assessment has arisen. In the opinion of many experts, this project is a very high-risk investment and its implementation will result in more harm than good. Moreover, the impact assessment has not been taken into account regarding the indirect effects on the ecosystem of the lagoon, associated with the difficulty of natural water exchange. Thus, even if the project really did not have alternatives, the compensation plan would only be adequate to the damage already occurred in the dunes – the compensation is completely irrelevant to the adverse changes that may arise in the ecosystem of the lagoon.

A2 motorway - the intersection of Lazy Obra valley in Poland. The A2 motorway in the Poznan-Berlin section (a key transport route in this part of Europe) has cut the valley of Lazy Obra river, protected as Natura 2000 SPA site. For geographical reasons, the intersection cannot be excluded. The best possible point of crossing was selected, but the construction of the highway will still destroy approx. 0.25 ha of oxbows (3150 habitat) and approx. 2 ha of riverside tall herbs (6430 habitat). In spite of the small size of the area, the effects are considered significant.

As compensation, the renaturalisation of not less than 5 km of the river valley must be provided in the form of reconstruction of river meandering and designation of the “channel of spontaneous river migration” - assuming that the spontaneous river bed dynamics will provide space for spontaneous restoration of related habitats. Today the river is a simple man-made canal. It was assumed that compensation would not only consist of the restoration of the old meandering, but needs also restoration of the natural riverbed dynamics.

A49 motorway in Germany. New section of A49 highway is planned between Neuental and Gemünden as a part of trans-European road network. After analyzing 12 alternatives, it was concluded there is no better alternative concerning Natura 2000. The proposed highway section will run through the western part of the Natura 2000 site “Herrenwald östlich Stadtallendorf”, cutting through this area on its margin. The project also includes the construction of a bridge with a height of 6 – 11 meter and a length of 350 meter, crossing the river Joßklein. 0.96 ha of habitat types 9110 will be destroyed. The priority habitat type 91EO* will be affected on 0.09 ha. Additionally, some changes will be caused to the local micro-climate, notably by light and rain interception by the new bridge, and by increased nitrogen depositions from road traffic, which will affect the habitat 91EO* and its characteristic plant species over an area of 5,50 ha. All possible mitigations (e.g., keeping the duration of the building activities as short as possible, utilising the existing industrial and forestry tracks as service roads, installation of noise barriers with a height of 4 meters, diverting surface water from the road and its embankments) were proposed; the bridge itself is part of the mitigation concept (it is proposed to bridge the alluvial area of the Joßklein river by means of a wide-span viaduct which is being constructed in line with the valley geometry). Nevertheless, the impact was still assessed as significant.
To compensate this, it is proposed to create an extensive alder-ash alluvial forest complex of the Habitat type 91EO* in the river system of the Joßklein and Klein rivers. Ca. 12 ha of the habitat type 91EO* will be newly created and Natura 2000 site will be extended. Important compensatory measures are the re-naturalization of the Joßklein river and the structural improvement of the alluvial areas of these rivers. These measures are intended to improve the ecological quality of the existing alder-ash alluvial forests. They will lead to a coherent system of areas with high ecological quality, linking the two Natura 2000 sites "Herrenwald östlich Stadtallendorf" and "Brückerwald and Hußgeweid" and creating an ecologically coherent area over a total length of 18 km. In 2010, European Commission approved the project and the compensation measures.

See also:
European Commission opinions relevant to Article 6 (4) of the Habitats Directive:

Bad examples

- As a compensation measure for the destruction of bird habitats in one of the road investments, the following was proposed: research on the content of heavy metals in soils and vegetation, the construction of two wildlife crossings, and fencing spring areas in the adjacent river valley. *None of these actions are compensation measures. The construction of wildlife crossings is a mitigation measure, but not for birds.*

- As a compensation measure for the removing part of the spruce forest for building a ski lift in the national park, payment for the national park was proposed. *Compensation cannot be limited to charges but must be a real action to the corresponding element of nature (see also in Advocate General of the European Court of Justice in Case C-209/04).*

- Impact of wind farms on birds was offered to be compensated as extensive management and support in rural areas and the promotion of the development of tourism infrastructure in adjacent areas. *Such actions are not regarded as natural compensation.*

- Impact of improving river embankments of riparian forest (Natura 2000, a nature reserve) was projected as “building the future” with the gate on the embankment, enabling flooding. *This action, yet closely related to the basic project and its impact, is mitigation, not compensation. As mitigation, it might be correct, if it had been incorporated into the plan of embankments renovation - nevertheless it is unacceptable to postpone compensation in the future.*

- Planned road crosses construction through a large forest complex. It was shown that the construction would have, among others, a negative impact on the population of hazel. To compensate the impact, afforestation was planned on agricultural land and on the former farmland on the edge of the complex. Land for afforestation, however, was designated on an adjacent area of Natura 2000, so it would cover floristically rich habitat type 6120, and would negatively affect the area of *Pulsatilla patens* and *Thesium ebracteatum*. *Compensation cannot destroy other natural values!*

- The planned road will destroy a natural midfield scrubs, habitat of red-backed shrike and barred warbler. As compensation for this, planting new bushes was offered. Planting was done by using *Sambucus nigra* and *Rosa rugosa*. Bushes of these species have unfavorable structure for related birds. *Rosa rugosa is an alien species, thus, its planting is unfavorable for nature. Furthermore, this plant cannot be used as a "pantry" by shrikes.*

- In exchange for the destruction or disturbance of habitat of shrike and barred warbler by road investment, forest clear-cuttings and thinnings were proposed. *In spite of the fact, that clear-cuttings and the less dense forest are favourable for shrikes and barred warblers, this measure can be regarded as "normal" forest management, and in any case cannot be considered as compensation.*
As compensation for destroying black woodpecker habitat, preparing nesting boxes for birds was offered. Nesting boxes are used only by rather common birds, black woodpecker will not benefit.

In exchange for the destruction of grasslands due to road construction (habitat 6510) a "meadow mowing on other areas of the same type" was planned. Meadow mowing is the normal way of managing natural habitat type 6510, therefore it cannot be a form of compensation. Compensation should be "something more" than normal management - it should consist of activities such as meadow restoration (seeding of herbaceous plant species important to biological diversity), new species-rich meadows creation at the expense of arable land, etc.

As compensation for the destruction of grasslands (6150 and 6210 habitats), afforestation was offered. Such compensation is inadequate, furthermore, it can even threaten the meadows and grasslands (depending on the specific location of afforestation).