



# Galichica National Park: Briefing on Biodiversity Offsets

## 1 Introduction

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This Briefing Note has been prepared to support the Strategic Environmental Assessment (SEA) for proposed Amendments to the Galichica National Park Management Plan (GNPMP). The purpose of the Briefing Note is to provide a summary of methodology proposed to achieve No Net Loss of biodiversity and to explain how this would work in the case of Galichica National Park.

The treatment of offsets in the SEA was conducted at a strategic level, based only on outline information on each project. A separate ESIA will be required for each project.

### 1.1 The Mitigation Hierarchy and No Net Loss

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The mitigation hierarchy is a concept widely used in environmental assessment to provide a structure that minimises the adverse impacts of projects. It is used in national environmental assessment regulations and in international good practice guidance to help project developers to limit, as far as possible, the negative impacts of development projects on the natural and human environment<sup>1</sup>.

In the context of Galichica National Park, this means:

- To avoid the creation of impacts in the first place by the careful location and design of a project;
- If impacts cannot be avoided, then to minimize impacts through design, location and management measures;
- If impacts occur, to rehabilitate or restore the area impacted after the impact has occurred;
- For any significant impacts that remain after these mitigations have been applied (referred to as residual impacts), to compensate for the impacts through a process of offsetting to get to a position of not net loss, or even a positive impact.

#### 1.1.1 No Net Loss

After using the mitigation hierarchy, significant residual impacts particularly for identified areas of high biodiversity conservation significance will require “offsetting” to bring the project to a point where biodiversity benefits are at least as great as the biodiversity losses to be incurred. This is referred to as No Net Loss which is defined as follows:

*The point at which the project-related impacts on biodiversity are balanced by measures taken to avoid and minimize the project's impacts, to understand on site restoration and finally to offset significant residual impacts, if any, on an appropriate geographic scale (e.g local, landscape-level, national, regional).<sup>2</sup>*

### 1.2 Biodiversity Offsets

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Biodiversity offsetting is a quantifiable procedure whereby residual impacts can be offset by increasing the biodiversity value of an area in equal or greater measure to the habitat being lost.

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<sup>1</sup> For example, <http://www.csbi.org.uk/wp-content/uploads/2015/09/CSBI-Mitigation-Hierarchy-Guide-Sept-2015-1.pdf>

<sup>2</sup> [IFC \(2012\) Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources. International Finance Corporation, Washington DC, U.S.A.](#)



### 1.2.1 What is an Offset?

A biodiversity offset is commonly defined as follows:

*Measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure and ecosystem function and people's use and cultural values associated with biodiversity.*<sup>3</sup>

Offset definitions often specify an end goal of no net loss or net gain, to provide complete compensation for significant residual impacts of the project. This may also be required by regulators, financing conditions or company policy.

Offsets almost always involve conservation interventions related to land management away from the site of direct project impact. Typically, offsets are in an area where the biodiversity features of concern (and subject to significant residual impact) are present.

Biodiversity offsets may be set up in terrestrial, freshwater or marine ecosystems. As well as offsets, projects may undertake 'additional conservation actions' (ACAs). The term refers to a wide range of interventions that are intended to be positive for biodiversity, the impacts of which may be hard to quantify. ACAs may or may not target biodiversity features that have been significantly impacted by a project, but unlike offsets they are not designed to provide measurable gains that can be set against those impacts.

## 1.3 Biodiversity Offsets Identified in the SEA

During the Strategic Environmental Assessment (SEA) into the proposed Amendments to the Galichica National Park Management Plan (GNPMP), the impacts on biodiversity arising from the proposed projects included in the Amended Management Plan were identified and discussed. The SEA made suggestions as to how these impacts could be avoided and reduced by refining the project designs. The biodiversity impacts of the revised project designs will be examined in more detail in each project ESIA. However, taking a precautionary approach, the SEA went on to examine to what extent the biodiversity impacts of each project could be offset, to satisfy the No Net Loss condition.

## 2 Biodiversity Impacts in Galichica National Park

Galichica National Park (GNP) is a protected area under Macedonian law and represents a key biodiversity "hotspot" in Europe with important natural and cultural heritage values. The Park was proclaimed as a National Park in 1958 with the aim of preserving the flora and fauna heritage and natural appearance of Mount Galichica. The boundaries for the Park were defined in Article 4 of the Law on Declaration of the Mountain of Galichica a National Park (O.G. No. 171/19).

A range of projects have been proposed for GNP and which have led to the proposed amendment to the GNPMP.

### 2.1 Key Impacts and Mitigations Identified in the SEA

The SEA described and assessed the impacts of each of the projects. In accordance with the mitigation hierarchy, before considering offsets, the SEA set out a number of specific ways in which biodiversity impacts could be avoided or reduced in each project. These include the following proposed measures:

#### **Galichica Ski Centre Project**

<sup>3</sup>[BBOP \(2012\) Glossary. Business and Biodiversity Offsets Programme, Washington DC, USA](#)



- The overall design/lay-out of the Ski Centre will avoid the most sensitive habitats (i.e. those located in the strictly protected areas) within the park
- Reducing the area of habitat loss at the Ski Centre, e.g. by forgoing the Nordic Ski Area, which would save 126 ha grasslands, 92 ha of juniper formations, and 12 ha of beech forest.
- Identify distribution area of *Crocus cvijicii*, and reconfigure Ski Centre project area accordingly;
- Investigate area of distribution of Apollo butterfly and its habitat, and reconfigure Ski Centre project area accordingly;
- Examine additives and water requirements for use of artificial snow and examine effects on ecology and hydrology.

### **A3 Expressway; Ohrid – State Border**

- Road alignment that minimises forest interactions;
- Assessment of technical options for Crno Brdo area (e.g. use of tunnel, land bridges, gallery sections), to reduce disturbance to ecological corridor;

### **Tourism Development Projects**

- Locate the planned development of Ljubanishta 3 TDZ to safeguard the surrounding ecology;
- Locate the Stenje TDZ to safeguard the Stenje wetland.

## 2.2 Residual Impacts Identified in the SEA

Despite the proposal of various mitigation measures, the SEA identified significant residual impacts on biodiversity that will result from implementation of the projects in the GNP, and will require to be offset in accordance with good international practices, unless the projects are significantly re-configured.

The residual impacts on sensitive habitats, for which biodiversity offsets were calculated, are listed in the table below.

**Table 2-1 Residual Biodiversity Impacts for Offset Evaluation**

Project	Significant Residual Biodiversity Impacts Identified
<b>Galichica Ski Project</b>	<ul style="list-style-type: none"><li>• 319 ha of alpine and subalpine calcareous grasslands destroyed (listed in Annex I of Habitats Directive);</li><li>• 106 ha of juniperus communis formations destroyed (listed in Annex I of Habitats Directive);</li><li>• 87 ha of Illyran <i>Fagus sylvatica</i> destroyed (listed in Annex I of Habitats Directive);</li></ul>
<b>A3 Expressway – Ohrid-State Border</b>	<ul style="list-style-type: none"><li>• 84 ha of <i>Quercetum trojanae macedonicum</i> (Macedonian Oak);</li></ul>
<b>Oteshevo Tourism Development Project</b>	<ul style="list-style-type: none"><li>• 59 ha of Hungarian Oak;</li></ul>

Note that the residual impacts outlined above are not the only residual biodiversity impacts identified. Some biodiversity impacts are unlikely to be off-settable and should be avoided completely, e.g. by re-configuring the project layout and design. These include the risks to unique ecology associated with karstic spring at St Naum, affected by Ljubanishta 3 TDZ, and the risk to the Stenje Wetland, affected by Stenje TDZ. These are discussed in the SEA.

Given the cost, practicalities and effort needed to establish offsets at such a significant scale, it is expected that each of the proposed projects will be revisited and re-designed or re-configured in a way to significantly reduce the amount and complexity of the biodiversity offsets needed.



## 2.3 Approach to Offset Calculation Used in the SEA

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A simple methodology was used in the SEA based on that developed by Treweek et al., (2010)<sup>4</sup>. This was used to calculate the approximate areas of offset needed for biodiversity impacts within the Park, as listed in Table 1 above.

### 2.3.1 Calculation of “Quality Hectares”

This approach not only considers the physical dimensions of the area of habitat which will be lost, but also takes into consideration the quality of that habitat and the time it will take to develop an area of habitat to a similar condition to that lost. This allows “quality hectares” to be calculated and used to define adequate offset measures.

For example, if an area of mature trees in good condition is destroyed, it may take several decades for a similar area of healthy, good condition forest to mature sufficiently to be considered as a valid compensation. As a result, planting 50 ha of saplings is not an adequate compensation for the loss of 50 ha of mature trees. Alternatively, if an area of degraded grassland is to be destroyed, this may be compensated for by a smaller area of good condition grassland, which due to its condition, can provide a similar level of biodiversity ‘value’ as the larger area of degraded grassland.

The methodology also takes into account the degree of uncertainty with which offsets may be applied. Where there is good experience in cultivating an offset for a particular species, and where a suitable habitat is likely to be found, then the degree of uncertainty will be low. Whereas if the particular species to be offset is known to be difficult to cultivate, or where the areas of suitable habitat are scarce, then the level of uncertainty will be high, and should be taken into account in the calculation.

### 2.3.2 Key Parameters Used in Offset Calculation

In summary, the following parameters are considered in the offset calculations;

- Distinctiveness of the habitat impacted;
- Condition of the habitat impacted;
- Uncertainty over the offset/reforestation/regrowth/cultivation process;
- Time needed to establish mature growth.

### 2.3.3 Offset Quantification

The methodology outlined in the SEA uses a simple numerical approach to allow qualitative issues to be considered on a quantitative basis. This approach takes the area of habitat affected, and calculates the area of habitat which needs to be cultivated in a new location, which will provide an equivalent ‘habitat value’. The output from the calculation is an offset area in hectares.

The approach is summarized in the flow chart below, and the steps are discussed in detail in the section below.

## 2.4 Offset Calculation Steps

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In this section each step in the offset calculation is discussed.

### 2.4.1 Step 1 - Identify Affected Habitat

Based on the impact assessment, identify those areas where residual impacts are anticipated and for which offsets will be required.

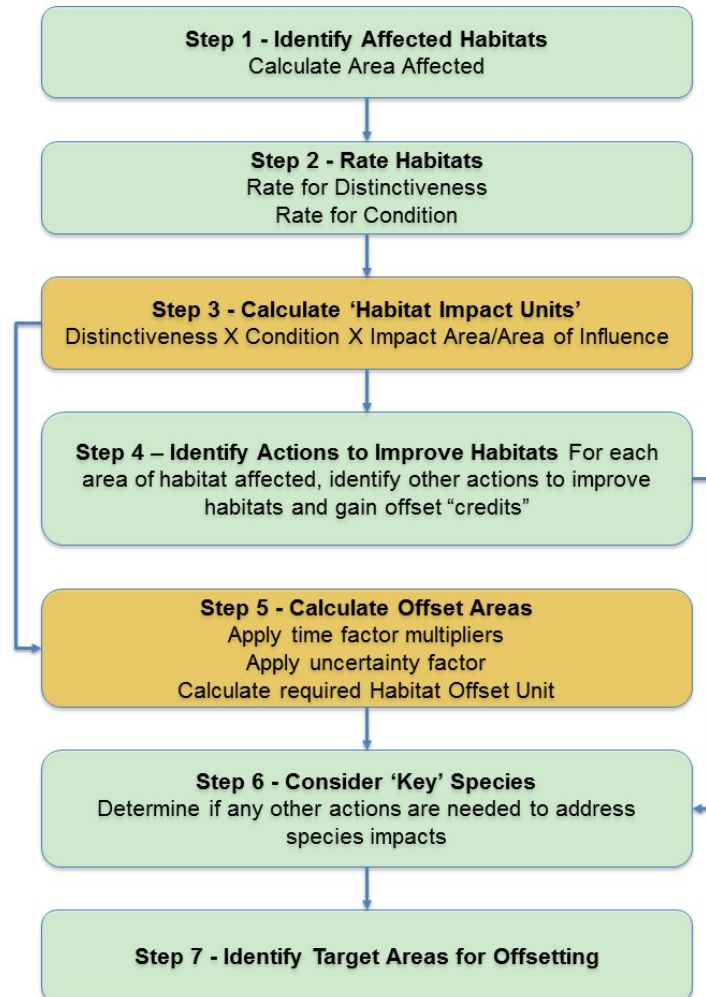
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<sup>4</sup>*Biodiversity offsets: possible methods for measuring biodiversity losses and gains for use in the UK.*, Treweek, J., Butcher, W., Temple, H. 2010.



Table 2-1 above lists the areas in hectares of Annex I habitat identified in the SEA which need to be offset.

**Figure 2-1 Summary of the Offset Process**



2.4.2 Step 2 - Rate Habitat Quality

Habitat quality is evaluated based on two key measures – distinctiveness and condition.

**Habitat Distinctiveness**

Each habitat area identified is rated for its ecological distinctiveness. Distinctiveness is specific to the value and importance of each habitat type and is unrelated to its condition.

Distinctiveness ratings were applied to each habitat type and plant community in GNP by an expert team including PINGP and Macedonian ecological specialists. These ratings are shown in the SEA in Table 5.5.

The distinctiveness rating system used is outlined below.

**Table 2-2 Habitat Distinctiveness Rating**

Distinctiveness Rating	Distinctiveness Description	Habitat Types
6	High	All Annex I Habitats



4	Medium	Mixed deciduous woodland
2	Low	Degraded grasslands adjacent to the coastal road
0	Very Low	Totally degraded areas converted to car parks, arable, etc

### Habitat Condition

Each habitat area identified is rated for its ecological condition.

The condition assessment was undertaken by PINPG and Macedonian ecological specialists, taking into account previous forest assessments conducted by PINPG.

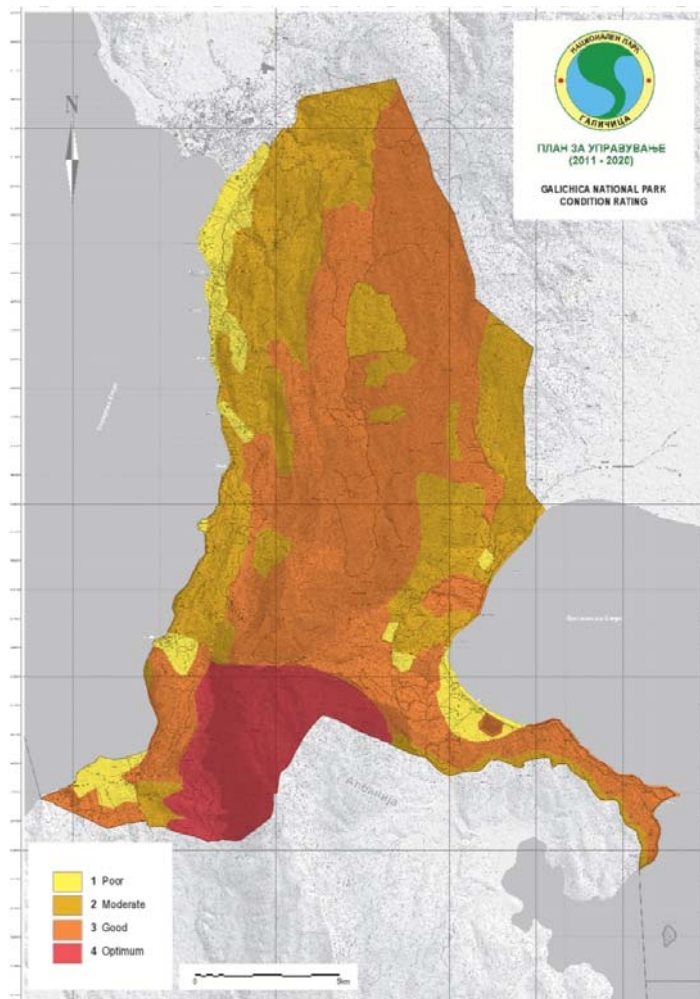
The Condition rating system used is outlined below.

**Table 2-3 Habitat Condition Rating**

Condition Rating	Distinctiveness Description
4	Optimum
3	Good
2	Moderate
0	Poor

The actual Condition Ratings applied to each area of the Park in the SEA, are shown in the figure below. Note that this Figure does not show all the detail of the smaller forestry plots. If a more fine grained calculation is needed, reference should be made to the PINGP's forestry management plan and data on each forestry plot.

**Table 2-4 Habitat Condition Rating Map for Galichica National Park**



#### 2.4.3 Step 3 – Calculate Habitat Impact Units

For each area of habitat to be offset, a numerical calculation of *Habitat Impact Unit* was made. This provides an assessment of the quality hectares that are impacted and so the *Habitat Impact Unit* gives an indication of the 'amount' of biodiversity value which needs to be offset.

The *Habitat Impact Units* calculated for each area of affected habitat, as the multiple of:

- Habitat distinctiveness (on a score from 0 – 6);
- Habitat condition (on a score from 1 – 4);
- The area impacted (in hectares).

$$\text{Habitat Impact Unit} = \text{Area Impacted (ha)} \times \text{Distinctiveness Rating (0-6)} \times \text{Condition Rating (1-4)}$$

#### 2.4.4 Step 4 – Identify Actions to Improve Habitats

The next step is to identify the potential management actions to improve the quality of areas that may be used for offsets. As with the impact calculations, the objective is to combine physical offset areas with improvements to the quality of those areas.



Example management actions could include:

- Reversing existing threats or pressures (e.g. deforestation, habitat fragmentation);
- Re-zoning to a higher level of protection, provided this is supported by costed management actions;
- Changing grazing pressures or prohibiting grazing;
- Restoring degraded grasslands;
- Replanting woodlands;
- Changing woodland management regimes.

For the SEA, possible offset areas were identified, comprising other areas of habitat within the Park, similar to those that would be impacted, and where actions could be taken to improve the extent or condition of the habitat within PINPG's overall aims as set out in the Park Management Plan. The following filters were used when considering potential offsets.

- It was assumed that each habitat type would be offset by the same habitat type. This is consistent with good international practices, given that the habitat types considered all had a high distinctiveness rating. Offsets were only applied where they were "like for like", i.e. offsets must improve existing habitat of the same type or land that can be restored to that type. Creation of new areas where the habitat has not previously occurred is unlikely to be acceptable for these habitats;
- Proposed offset areas must be accessible by individual animals of the impacted population (by themselves or with assistance);
- Additional conservation actions were considered where possible at the SEA level;
- Any replacement habitat must have equivalent connectivity to impacted habitat or be located to ensure that connectivity is maintained (e.g. for species such as lynx, locate offsets to maintain movement corridors through the landscape).

This stage is important, as the application of offsets is not a simple numerical approach but is informed by expert knowledge of the biodiversity value and potential value of the proposed offset areas.

#### 2.4.5 Step 5 – Calculate Habitat Offset Areas

Quantification of the potential habitat offset areas available is undertaken using the concept of *Habitat Offset Units*. This is a process similar to the calculation of *Habitat Impact Units*, and it takes into account the following:

- The distinctiveness of the potential offset area (rating from 0 – 6);
- The current condition of the habitat in the potential offset area, and the possible new condition following the management actions (rating from 1 – 4);
- A factor to allow for the amount of time needed for a new habitat to establish (1 – 32);
- An uncertainty factor to account for the uncertainty of the restoration scheme (1 – 10).

#### **Ecological Distinctiveness of the Target Offset Area**

A distinctiveness rating is applied to the habitat type of the target offset area, using the same ratings as for the impacted habitats.

#### **Likely Change in Condition of Target Offset Area**

A judgement must be made as to the ***change in condition*** which will result from the offset/management action. The same condition ratings as used earlier is also used here. In other words, if the target offset habitat is an area of degraded woodland in 'poor' condition, which will be upgraded to 'good' condition





woodland as a result of the offset activity (e.g. reforestation), then its condition rating will improve from 0 (poor) to 3 (good). The change in condition rating is therefore 3. However, if the target offset is in moderate condition (rating 2), and will be improved to good condition (rating 3), then the change is condition rating is therefore only 1.

### Time Factor

Given that the “outcome” of proposed offsets can often take years to establish, a corrective factor or “multiplier” is applied to allow for the amount of time needed for this new habitat to establish. The factors used are given in the table below, taken from the UK’s Department of Environment, Food and Rural Affairs (DEFRA) guidance (2012)<sup>5</sup>.

**Table 2-5 Time Factors Used in the Offset Assessment**

Years to Target Condition	Time Factor Multiplier	Example Habitat Type Application
5	1.2	
10	1.4	Grasslands
15	1.7	Juniper
20	2.0	
25	2.4	
30	2.8	
> 32	3.0	Beech and Oak Forest

### Uncertainty Factor

One further multiplier is used, to account for the uncertainty of the offset outcome (e.g. a high uncertainty factor could suggest that the proposed activity is largely experimental while a low uncertainty level would indicate that there is a high degree of predicted success).

**Table 2-6 Uncertainty Factors Used in the Offset Assessment**

Uncertainty of Success	Uncertainty Factor Multiplier
Very high	10
High	3.0
Medium	1.5
Low	1.0

### Calculation of Habitat Offset Units

A calculation of the *Habitat Offset Unit* is then made as follows:

$\text{Habitat Offset Unit} = \text{Area of Required Offset (ha)} \times \text{Distinctiveness (0 - 6)} \times \text{Change in Condition (1 - 4)} \times \text{Time Factor (1 - 32)} \times \text{Uncertainty Factor}$
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In order to calculate the *Area of Required Offset*, the simple assumption is made that for each area of affected habitat, the Habitat Offset Unit must be greater than the Habitat Impact Unit, i.e.;

$$\text{Habitat Offset Unit} > \text{Habitat Impact Unit}$$

<sup>5</sup>[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/69531/pb13745-bio-technical-paper.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69531/pb13745-bio-technical-paper.pdf).



Since the value of the Habitat Impact Unit is known for each area of habitat affected, and all parameters of the Habitat Offset Unit are known, the *Area of Required Offset* can be calculated for each habitat type. The actual calculations for the habitat types identified within the SEA are shown in *Section 4* below.

#### 2.4.6 Step 6 - Consider Key Species

Additional consideration is needed on whether the habitat offsets identified in the SEA are sufficient or whether additional measures need to be taken over and above the habitat offsets.

This determination was made by PINPG staff together with three Macedonian ecological experts with intimate knowledge of the Park and its biodiversity, and a detailed discussion of this appears in the SEA.

Offsets for habitats and species will need to be revisited at a project level in the ESIA's based on actual survey data of the footprints and area of impact. Potentially, additional habitat and species types could be identified and potential additional residual effects identified which may require offsets. The SEA identifies potential residual effects on key habitats and the key species which may '*typically*' occur in these habitats – this is considered to be sufficient to meet the strategic level assessment requirements.

#### 2.4.7 Step 7 - Identify Target Areas for Offsetting

Based on the above, an offset delivery plan is then required. This will include mapping of the exact areas where offsetting could occur, and listing the specific management actions needed to deliver the proposed offset.

### 3 Summary of SEA Offset Calculations

The SEA described and assessed the impacts of each project proposed in the revised Management Plan. The key projects comprise:

- Galichica Ski Centre Project;
- A3 Expressway; Ohrid – State Border;
- Tourism Development Projects.

#### 3.1 Summary of Biodiversity Offset Proposals in SEA

The table below summarises the offsets that are considered to be potentially deliverable, based on available information. For the Projects as currently proposed, offsets for the following habitats would not be fully achievable within the Park:

- Macedonian Oak
- *Fagus Sylvatica*
- *Quercetum frainetto*

Alternative locations for potential offsets for these habitats will therefore need to be identified elsewhere. The detailed surveys and assessments required to identify such areas would have to be undertaken before the ability to offset impacts could be confirmed. In all cases, achieving required outcomes will require financial investment for many years. The implementation frameworks needed to ensure adequate financial provision and support active management will need to be articulated in Biodiversity Offset Management Plans, which would have to be developed at ESIA stage for each project.

The SEA evaluation of the scope for delivery of offsets was made based on the available information. However, more detailed investigations will be needed at a project level to confirm that impacts are offsettable and to identify the precise management interventions that would be needed to deliver effective offsets.

A detailed assessment of costs of offset implementation and ongoing management is needed, as well as a detailed implementation plan with clear institutional frameworks and finance provision.



**Table 3-1 Summary of Biodiversity Offset Actions Identified in the SEA**

Habitat Type	Offset Needed	Potential Offset Area	Management Action	Risk of residual impact with offsets in place.
<b>A3 Expressway: Ohrid to Peštani section</b>				
No offsets identified within SEA level assessment				
<b>A3 Expressway: Peštani to Albanian State Border section</b>				
Macedonian Oak, HD 9250	504 ha upgraded by 1 Condition Level.	220 ha Macedonian Oak forest identified as having potential for improvement (within a total area of 400 ha).  <b><u>Additional areas would have to be identified outside the Park to meet the full offset requirement.</u></b>	PINPG removes this 400 ha area from its firewood production plan, requiring equivalent compensation to PINPG to compensate for lost income. Additional finance may be needed to support any additional management.  Investment in appropriate management actions will be necessary for 30 to 40 years.  <b><u>Given PINP are a self-financing agency it is not possible to recommend this offset unless long-term compensatory support to PINPG is put in place to compensate for the loss of forestry revenue.</u></b>	The long time needed to establish high quality mature oak forest means that impacts are not offsetable in the short term within the Park. The long time for establishment increases risk of failure due to changes in management, political support or finance. Chances of success are more certain within the Park than outside it, where it would be necessary to establish a suitable offset delivery framework through an organization with suitable management skills. However, this is not possible given the current reliance of Park funding on forestry.  <b><u>SEA Conclusion: This offset is effectively not achievable within the Park. Therefore an offset area of 504 ha would need to be identified by the Project outside the Park.</u></b>
<b>Galichica Ski Centre</b>				
Alpine and sub-alpine calcareous grasslands, HD 6170	1,344 ha upgraded by 1 Condition Level	An area of 1,600 ha identified in north of Park, with potential for improvement.	The baseline situation for this Annex I habitat is decline in area and condition due to climate change and lack of active management, allowing natural succession to scrub. The offset would involve arresting natural succession in a demarcated through active grazing management, possibly through management agreements with livestock farmers or alternatively through purchase of livestock to be managed by Park Authorities. There will be a requirement for ongoing investment in suitable management for at least the planned lifetime of projects causing impacts.	None- <i>Assuming management actions etc implemented effectively.</i>  (Residual impacts are possible if management is ineffective or if levels of physical damage due to trampling and other recreational use are higher than expected. Note there is a residual risk that associated species populations may fail to colonise restored habitat in new locations, exposing them to significant residual impacts despite offsetting.)
<i>Juniperus communis</i> , HD 5130	541 ha	An area of 541 ha identified in north of Park, with potential for improvement in condition by altering grazing levels, allowing natural	PINPG to take action (fencing, signage, patrols, etc) to prevent grazing in this area, to allow juniper to establish.	None- <i>With proposed interventions it should be possible to ensure&gt;NNL of this habitat type within the Park despite changes in the Management Plan and the implementation of proposed development projects.</i>



Habitat Type	Offset Needed	Potential Offset Area	Management Action	Risk of residual impact with offsets in place.
		recolonisation.		
<i>Fagus sylvatica</i> , HD 91K0	783 Ha	An area of around 300 ha is available in the north of the Park, which has the potential for improvement. An additional 483 ha of suitable land needs to be identified outside the Park to meet the full offset requirement.	PINPG places this area into active management, and devotes resources to managing the area (currently, no resources available to monitor and manage area).  Access to additional suitable land outside the Park is needed, together with funds to support replanting or management, for example removal of forest exploitation.	Offset identified insufficient – an additional 483 ha of offset needs to be identified outside the Park.  Until suitable areas outside the Park have been identified, a residual impact would remain. Even with offsets, a temporal loss of this forest type will occur. While the proposed method factors this into the offset calculation using a multiplier, there is nevertheless a period of time within which forest habitat available to associated animal populations will be reduced. This could affect the viability of some species populations and this should be investigated in further detail at Project ESIA level.
<b>Ljubanishta TDZ</b>				
<b>Component 1 &amp; 2:</b> No offsets identified within SEA level assessment				
<b>Component 3:</b> The assessment identified a significant residual effect arising as a result of Ljubanishta 3 TDZ component. However, since the biodiversity effected includes unique aquatic habitat and endemic species it is <b>not considered appropriate or possible to offset this loss.</b>				
<b>Stenje TDZ</b>				
The assessment identified significant residual effects arising as a result of Stenje TDZ. However, since the biodiversity effected includes unique aquatic habitat and endemic species it is <b>not considered appropriate or possible to offset this loss.</b>				
<b>Otoeshevo TDZ</b>				
<i>Quercetum frainetto</i>	540 ha upgraded by 1 condition level	540 ha available to south of Oteshevo, identified as having potential for improvement through cessation of forestry activities. Alternatively suitable land would have to be found outside the Park.	PINPG removes 540 ha of <i>Quercetum frainetto</i> from its firewood production plan.  Compensatory support to PINPG is required.  <b><u>Given PINP are a self-financing agency it is not possible to recommend this offset unless long-term compensatory support to PINPG is put in place to compensate for the loss of forestry revenue.</u></b>	It was not possible to identify suitable areas for restoration of this type of forest outside the Park in this study. Unless an assured compensatory payment mechanism is in place to ensure that PINPG is compensated for lost income from its firewood production plan, or alternative offset locations can be found, there will be residual impacts.  <b><u>SEA Conclusion: This offset is effectively not achievable within the Park. Therefore an offset area of 540 ha would need to be identified by the Project outside the Park.</u></b>



## 4 Next Steps To Design & Implement Biodiversity Offsets

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For a number of the proposed projects, or elements of the proposed projects, no suitable offset opportunity has been identified (e.g. Ljubanishta TDZ and Stenje TDZ). These will require further consideration. For those projects for which offset opportunities have been identified, the following steps will be required to develop the concepts set out in the SEA into fully-developed and implementable offset programmes. Note that the treatment of offsets in the SEA was conducted at a strategic level, based only on outline information on each project. The results should not be taken as the final design of the offsets.

Each project must firstly be re-evaluated based on this preliminary assessment, and re-configured in order to reduce the biodiversity impacts as far as possible using the mitigation hierarchy. In conjunction with a reappraisal of the design an ESIA for each project will determine whether any residual biodiversity impacts remain, and whether it is possible that they can be compensated for by biodiversity offsetting. At that point, if the authorities wish to proceed with the project, the biodiversity offsets required for each project can then be recalculated, offset locations identified, and a detailed offsetting plan developed.

### 4.1 Next Steps

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The next steps for the identification, design and implementation of biodiversity offsets are as follows:

#### 4.1.1 Step 1 - Revise Project Designs

The proponent for each project needs to consider the likely impacts identified in the SEA, and should consider re-configuring the project to reduce the impacts in general, the biodiversity impacts in particular.

With an awareness of the likely cost and complexity of delivering the offsets needed, there is a new incentive to avoid and minimize impacts, especially where these can be done without significant cost to the project objectives. In some cases, it may be prudent to consider cancellation of a project, or project component entirely.

#### 4.1.2 Step 2 - Re-evaluate Biodiversity Impacts

Once each project has been revised and redesigned, and once more detailed information on the project layout, design, etc is available, the project-level impacts need to be investigated in more detail, and the residual biodiversity impacts identified clearly and specifically. At this stage, the need and/or scale for biodiversity offsets can be re-evaluated.

#### 4.1.3 Step 3 - Re-Calculate Biodiversity Offsets

Following the project re-configurations, based on the actual need for offsets, which will hopefully be significantly less than what was identified in the SEA, a new calculation can be made of the offsets needed.

#### 4.1.4 Step 4 - Identify Target Offset Areas

Knowing the actual offsets needed, identification of target locations can begin. One concern is over the level of offsets that are currently needed may require project developers (and PINPG) to identify offsets outside of the Park. If offsets are required outside the National Park, then issues of land expropriation and authority for management of the offsets will need to be clarified.

#### 4.1.5 Step 5 - Develop Biodiversity Offset Plans

Each project will need to develop a specific biodiversity offset plan that identifies financing mechanisms to sustain these activities over time. Both technical and regulatory stakeholders will need to be involved, as well as other affected stakeholders (e.g. land owners, local residents). The implementation and management of the offsetting must be carried out by experienced biodiversity experts, with the approval of the regulatory authorities.



#### 4.1.6 Step 6 - Implement a Long Term Offset Monitoring Programme

Long term monitoring of the offsets is crucial, in order to confirm that they will actually result in desired outcomes of *No Net Loss* of biodiversity features/values. Multi-stakeholder and involvement of national/international experts is encouraged. The ownership of the above process will need to be clarified, as the project proponents are unlikely to have the skills necessary to design and implement the offsets. The involvement of the PINPG, NGOs and environmental regulatory authorities will be crucial.