

Periodic Review

Killarney National Park Biosphere Reserve

UNESCO



Photo credit: Paudie O'Leary



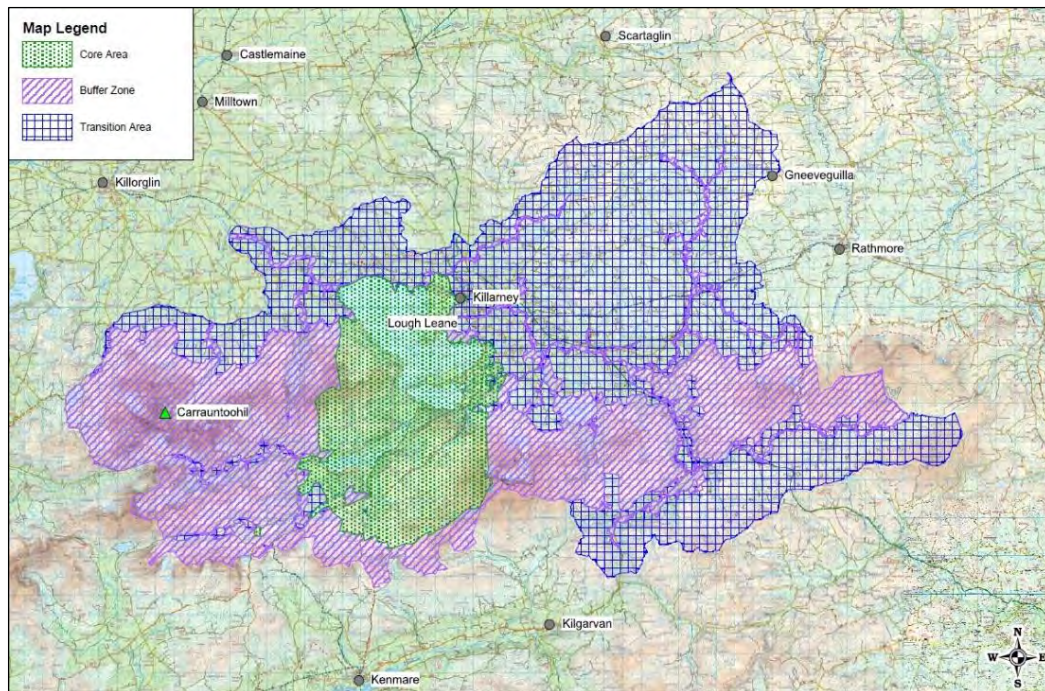
An Roinn Ealaíon, Oidhreachta,
Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage,
Regional, Rural and Gaeltacht Affairs

MAY 2017

Killarney National Park was awarded UNESCO Biosphere Reserve status in 1982. This report is the first periodic review of the UNESCO Biosphere reserve, under Article 9 of the Seville Strategy. It has been prepared by Kerry County Council and the National Parks and Wildlife Service of the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, and follows the format of the UNESCO form "Periodic Review for UNESCO Biosphere Reserve (January 2013)".

To meet criteria for UNESCO Biosphere reserves under Article 4 of the Seville Strategy, it is proposed to extend the Killarney National Park UNESCO Biosphere Reserve to include areas hydrologically and ecologically connected to the existing Core Area. With the support and involvement of local communities, zonation is proposed that reflects legal protections and sustainable management practices in place in Co. Kerry. The newly defined UNESCO Biosphere Reserve will be known as the *Kerry UNESCO Biosphere Reserve*.



Kerry UNESCO Biosphere Reserve: Proposed Scale & Zonation

Table of Contents

Overview.....	1
PART I Summary.....	10
PART II Periodic Review Report	18
1 UNESCO Biosphere Reserve: Killarney National Park UNESCO Biosphere Reserve, Ireland	18
1.1 Year designated	18
1.2 Year of first periodic review and of any following periodic review.....	18
1.3 Follow-up actions taken in response to each recommendation from previous periodic reviews.....	18
1.4 Other observations or comments on the above	18
1.5 Process of periodic review	18
1.5.1 Stakeholders	18
1.5.2 Methodology for stakeholder involvement	22
1.5.3 Number of meetings held	23
1.5.4 Details of attendance and quality of representation	24
2 Significant Changes in the UNESCO Biosphere Reserve During the Past Ten Years.....	25
2.1 Summary	25
2.2 Updated background information	25
2.2.1 Updated coordinates	26
2.2.2 Updated map	26
2.2.3 Changes in the human population of the UNESCO Biosphere reserve	26
2.2.4 Update on conservation function.....	28
2.2.5 Update on the development function	29
2.2.6 Update on logistic support function.....	29
2.2.7 Update on governance management and coordination	30
2.3 The authorities in charge of managing the UNESCO Biosphere reserve.....	30
2.3.1 Updates to management policy.....	30
2.3.2 Budget and staff support	31
2.3.3 Communications strategy for the UNESCO Biosphere reserve	32
2.3.4 Strategies for fostering networks of cooperation.....	32
2.3.5 Approaches adopted for addressing the socio-cultural context.....	33
2.3.6 Use of traditional and local knowledge in management.....	34
2.3.7 Community cultural development initiatives	35
2.3.8 Languages spoken and written in the UNESCO Biosphere reserve – changes and revitalization	35
2.3.9 Effectiveness of management/coordination	36
2.4 Matters of special interest with regard to the KNP UNESCO Biosphere Reserve	36
2.4.1 Local/regional/national plans that address the UNESCO Biosphere	36
2.4.2 Outcomes of management/cooperation plans of government agencies and other organizations	36
2.4.3 Continued involvement of local people.....	36
2.4.4 Women’s roles in the UNESCO Biosphere	37
2.4.5 Changes in the main protection regime of the Core Area(s) and of the Buffer Zone(s)	38
2.4.6 Research and monitoring activities undertaken in the UNESCO Biosphere reserve....	38
2.4.7 Strengthening of collective capacities for overall governance.....	38
2.4.8 Additional information about the interaction between the three zones	39

2.4.9	Participation of young people.....	40
3	Ecosystem Services.....	42
3.1	Ecosystem services within the UNESCO Biosphere and beneficiaries	42
3.2	Changes in indicators of ecosystem services	44
3.3	Update on biodiversity involved in ecosystem service provision	45
3.4	Recent/updates ecosystem service assessment	46
4	The Conservation Function	48
4.1	Significant changes in the main habitat types, ecosystems, species or varieties of traditional or economic importance	48
4.2	Main conservation programmes conducted in the UNESCO Biosphere over the past 10 years	49
4.3	Integration of conservation, sustainable development and stewardship	57
4.4	Assessment of effectiveness of strategies and actions	59
4.5	Main factors influencing conservation efforts.....	59
4.6	Other comments/observations from a UNESCO Biosphere reserve perspective..	60
5	The Development Function.....	61
5.2	Tourism in the UNESCO Biosphere.....	61
5.3	Other key sectors and uses of the UNESCO Biosphere.....	64
5.4	Economic benefits of the UNESCO Biosphere to local communities	64
5.5	Assessment of effectiveness of actions or strategies applied.....	64
5.6	Community economic development initiatives	65
5.7	Local business or other economic development initiatives.....	65
5.8	Changes in cultural values and heritage	66
5.9	Community support facilities and services	66
5.10	Indicators for activities to foster sustainable development	66
5.11	Main factors influencing the success of development efforts	66
6	The Logistic Function	67
6.2	Main research themes undertaken to address management	70
6.3	Collection and dissemination of traditional and local knowledge.....	72
6.4	Environmental/sustainability education	73
6.5	Assessment of the effectiveness of actions and strategies	77
6.5.1	The UNESCO Biosphere reserve’s main internal and external communication mechanisms/systems.....	77
6.5.2	UNESCO Biosphere reserve website.....	77
6.5.3	Electronic newsletter.....	77
6.5.4	UNESCO Biosphere reserve social networks.....	77
6.5.5	Other internal communication systems.....	77
6.6	Contribution of the UNESCO Biosphere to the word network of UNESCO Biosphere reserves	78
6.6.1	Collaboration with existing UNESCO Biosphere reserves at national, regional, and international levels, also within regional and bilateral agreements.....	78
6.6.2	Current and expected benefits of international cooperation for the UNESCO Biosphere reserve	78

6.6.3	Contribution to the World Network of UNESCO Biosphere Reserves in the future and to the Regional and Thematic Network.....	79
6.7	Main factors influencing the logistic support function.....	79
6.8	Other Comments.....	79
7	Governance UNESCO Biosphere Reserve Management and Coordination.....	80
7.1	Technical and logistical resources for the coordination of the UNESCO Biosphere reserve	80
7.2	Overall framework for governance.....	81
7.3	Social impact assessments or similar tools and guidelines used to support indigenous and local rights and cultural initiatives.....	82
7.4	Main conflicts and solutions.....	82
7.4.1	Main conflicts regarding access to, or the use of, resources in the area and the relevant timeframe.....	82
7.4.2	Conflicts in competence among the different administrative authorities involved in the management of the area comprising the UNESCO Biosphere reserve.....	83
7.4.3	Means used to resolve conflicts.....	84
7.5	Community representation, consultation and participation in the UNESCO Biosphere.....	84
7.5.1	Representation of local people in the planning and management of the UNESCO Biosphere reserve.....	84
7.5.2	Form of representation.....	84
7.5.3	Procedures for integrating the representative body of local communities.....	86
7.5.4	How long-lived is the consultation mechanism?.....	86
7.5.5	Impact of consultation on the decision-making process.....	86
7.5.6	Public Involvement in UNESCO Biosphere management.....	87
7.6	Update on management and coordination structure:.....	87
7.6.1	Changes regarding administrative authorities that have competence for each zone..	87
7.6.2	Information about the manager(s)/coordinator(s) of the UNESCO Biosphere reserve including designation procedures.....	87
7.6.3	Changes with regard to the coordination structure of the UNESCO Biosphere reserve	87
7.6.4	Adaption of coordination to suit the local situation.....	87
7.6.5	Evaluation of the effectiveness of the coordination of the UNESCO Biosphere.....	88
7.7	Update on the management policy.....	88
7.7.1	Changes with regard to the management policy and the stakeholders involved.....	88
7.7.2	Contents of the Management Policy.....	88
7.7.3	Description of the role of the authorities in charge of the implementation of the policies	89
7.7.4	Description of how management policies address the objectives of the UNESCO Biosphere reserve.....	89
7.7.5	Progress with regard to the guidelines of the management policies.....	90
7.7.6	Factors and/or changes that impeded or helped with the implementation of the management policies.....	91
7.7.7	Description of how the UNESCO Biosphere reserve is integrated in regional/national strategies.....	91
8	Criteria and Progress Made.....	98
9	Supporting Documents.....	104
10	Addresses.....	107

ABBREVIATIONS

CDB	Congested Districts Board
cSAC	candidate Special Area of Conservation
CSO	Central Statistics Office
DAHRRGA	Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs
DECLG	Department of the Environment, Community and Local Government
DEHLG	Department of Environment, Heritage and Local Government
DIT	Dublin Institute of Technology
ED	Electoral Division
EPA	Environmental Protection Agency
ESA	Ecosystem Service Assessment
GMIT	Galway Mayo Institute of Technology
IFI	Inland Fisheries Ireland
IT	Institute of Technology
ITT	Institute of Technology Tralee
I-WeBS	Irish Wetland Bird Survey
KCC	Kerry County Council
KCDP	Kerry County Development Plan
KNP	Killarney National Park
KTDP	Killarney Town Development Plan
LCA	Landscape Character Assessment
MAB-ICC	Man and UNESCO Biosphere – International Co-ordinating Council
NBDC	National Biodiversity Data Centre
NFQ	National Framework of Qualifications
NHA	Natural Heritage Area
NIAH	National Inventory of Architectural Heritage
NPF	National Planning Framework
NPWS	National Park and Wildlife Service
NUIG	National University of Ireland Galway
ORBIT	Outdoor Resources Brought Into Teaching
pNHA	proposed Natural Heritage Area
RMP	National Record of Monuments and Places
RPG	Regional Planning Guidelines

SAC	Special Area of Conservation
SFI	Science Foundation Ireland
SPA	Special Protection Area
TCD	Trinity College Dublin
UCC	University College Cork
UCD	University College Dublin
UL	University of Limerick
UNESCO	United Nations Educational, Scientific and Cultural Organization

Units

ha	hectares
km	kilometre
km ²	square kilometre
kt	kilotonnes

OVERVIEW

Kerry is the most western county of Ireland and fourth largest in extent. The county is renowned as one of the most scenic areas in Ireland and as a significant tourist destination. Killarney town is the centre of the tourism industry in the county (Figure 1.1). It has attracted visitors for at least 250 years, making it the oldest and most famous tourist destination in Ireland. The main attraction for visitors to Killarney is Killarney National Park (KNP) (<http://www.killarneynationalpark.ie>)

KNP is Ireland's first and oldest National Park. It comprises the Muckross Estate, donated to the Irish State by the Bourn Vincent family in 1932, and subsequent acquisitions by the Irish State of lands formerly part of the neighbouring Killarney Estate, owned by the Browne family, (Earls of Kenmare), and latterly the McShain family. The combined properties now comprise the KNP UNESCO Biosphere Reserve, situated adjacent to Killarney town (See Figure 1.2).

KNP encompasses a variety of mountains, lakes, woodlands, waterfalls and antiquities that are world famous. The park is of particularly high ecological value because of the quality, diversity and extensiveness of many of its habitats and the wide variety of species, some of which are rare. The National Parks and Wildlife Service (NPWS) has been the primary governing body for the UNESCO Biosphere since its establishment. It is a fully integrated division of the Heritage division of the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs. Reference to NPWS in the following report is in this context.



Killarney National Park UNESCO Biosphere Reserve

KNP was designated a UNESCO Biosphere Reserve in 1982 (Figure 1.2). The boundary of the biosphere was initially determined by the NPWS based on the extent of State owned lands comprising the national park. This is the first periodic review of the KNP UNESCO Biosphere Reserve, undertaken in partnership between Kerry County Council and NPWS. As part of this review process, changes in the scale and zonation of the biosphere are proposed to fulfil "Article 4 Criteria for UNESCO Biosphere Reserves" of the Seville Strategy.

To reflect the proposed changes and wider area covered by the extended biosphere reserve, a new governance structure will be established comprising a partnership between Kerry County Council and NPWS and it is proposed to name the newly defined biosphere the Kerry UNESCO Biosphere Reserve. This is described in the following sections:

Kerry UNESCO Biosphere Reserve Extent

KNP UNESCO Biosphere Reserve's Core Area is not an isolated island of interest, but is part of a larger area of natural value which includes the MacGillycuddy Reeks mountain range and an array of freshwater rivers and lakes within the Lough Leane catchment area. Ecological tourism, recreation and education are significant elements of the economy in the region, requiring local communities to embrace a culture of conservation as well as sustainable approaches to recreation, educational use, agricultural practices and residential, infrastructural and industrial development.

An extension of the KNP UNESCO Biosphere Reserve boundary is proposed to incorporate areas of the MacGillycuddy Reeks and Lough Leane catchment (Figure 1.3). These areas are generally not in State ownership but are hydrologically linked or have habitat connectivity with the Core Area of the biosphere. Therefore, sustainable land uses in these areas are important in supporting the integrity of the biosphere. There are many legislative and policy instruments in place to safeguard habitats (see Natura 2000 Standard Data forms for relevant sites in Supporting Documents) and to ensure sustainable land use and development in these areas. In addition, there is a high level of stakeholder collaboration in place to ensure that the region is managed effectively but also meets the requirements of the local communities.

There follows a brief description of the main features of the extended biosphere, the proposed Kerry UNESCO Biosphere Reserve, and some examples of how the local stakeholders are working together for conservation and sustainable development.

Lough Leane Catchment

Lough Leane is the largest of the lakes within KNP UNESCO Biosphere Reserve. The catchment contains numerous tributary rivers, streams and lakes, and drains an area of 560 km² (Figure 1.4). The catchment is renowned as one of Ireland's premier trout and salmon fisheries. Declines in river and water quality within the catchment represents a threat to wildlife and habitats within KNP UNESCO Biosphere Reserve.

The Lough Leane Working Group was established in 1997, to co-ordinate efforts to monitor and manage water quality within the catchment. The working group comprises representatives from local authorities, statutory bodies, land users and local interest groups. The Monitoring and Management System is a major catchment-based initiative, aimed at arresting the eutrophication process and restoring the rivers and lakes to a satisfactory state. A further aim of the project is to identify and quantify all significant point and diffuse sources of pollution, particularly from local authority activities, agriculture, forestry and septic tanks.

The Lough Leane Catchment was defined by the subcatchments of tributary rivers as defined under the EU Water Framework Directive (2000/60/EC). These include subcatchments for the rivers Crinnagh, Laune, Deenagh, Flesk (Kerry) and Quagmire (Figure 1.4).



The River Flesk within the Lough Leane Catchment (credit: Kerry County Council)

MacGillycuddy Reeks

The MacGillycuddy Reeks, located immediately to the west of KNP UNESCO Biosphere Reserve, is Ireland's highest mountain range. The mountains cover over 100 km² and contain nine of the country's twelve summits that exceed 900 m in altitude, including Ireland's highest peak, Carrauntoohil. The reeks contain wildlife and upland habitats complimentary to those within KNP UNESCO Biosphere Reserve. However, the MacGillycuddy Reeks is one of Ireland's leading outdoor recreational destinations and erosion represents a threat to upland habitats.

The MacGillycuddy Reeks Mountain Access Forum was established in 2014 to manage, protect and sustainably develop lands within the MacGillycuddy Reeks. The forum comprises a combination of local and statutory agencies and authorities, land owners and interest groups. Objectives of the forum include conservation of the uplands, provision for the growing number of visitors and sustainable development of the region.

The MacGillycuddy Reeks boundary was determined by areas covered by the Mountain Access Forum. These areas are under the greatest pressure from recreation and erosion.



The MacGillycuddy Reeks (credit: MacGillycuddy Reeks Mountain Access Forum)

Kerry UNESCO Biosphere Reserve Zonation

The KNP UNESCO Biosphere Reserve is solely contained within the national park boundary. It does not currently identify different zones. As part of the review process, it was determined that zoning within the existing biosphere boundary would not be appropriate under current criteria, namely the existing biosphere area is not large enough to serve the three functions of biosphere reserves (Article 4.4 of the Seville Strategy 2003). Therefore, it is proposed to retain and expand the existing UNESCO Biosphere Reserve as the Core Area, to reflect lands in State ownership, primarily managed for long term nature conservation.

In addition, it is proposed to significantly expand the biosphere boundary to encompass Buffer and Transition Areas within the Lough Leane Catchment and MacGillycuddy Reeks mountain range (Figure 1.3). As described above, these areas are hydrologically linked or have habitat connectivity with the Core Area of the biosphere. In addition, these areas demonstrate conservation objectives and sustainable management practices that support those within the proposed Core Area. There follows a brief description of the biosphere zones proposed within the extended Kerry UNESCO Biosphere Reserve.

A legally constituted Core Area devoted to long term protection

The proposed Core Area encompasses the full extent of KNP and Eirk Bog Nature Reserve. The total size of proposed Core Area covers 10,370 ha. This is larger than the current biosphere area, covering 10,129 ha.

KNP is an area of prime natural interest with a distinctive combination of mountains, lakes, woodlands and waterfalls. The site is of particularly high ecological value because of the diversity, quality and extent of many of the habitats present. It includes the largest area of Ireland's remaining oak woodlands and the only sizeable yew woodland in Ireland. In addition, the last surviving indigenous herd of red deer are found within the national park as well as an extensive list of rare species of flora and fauna. Several important cultural heritage sites are found within the park, including Muckcross House, Muckcross Abbey, Ross Castle and

Killarney House and Gardens. Eirk Bog Nature Reserve forms part of a very well developed and little disturbed example of an intermediate bog with associated poor fen and blanket bog, and wet heath communities.



Ireland's last population of indigenous deer (credit: Chris Barron)

The Core Area of the biosphere will remain the same. It is subject to several national and international environmental designations which entail important legal responsibilities. The Core Area covers all or part of the following designated sites:

- Killarney National Park
- Killarney National Park Special Protection Area (SPA)
- Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment Special Area of Conservation (SAC)
- Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment proposed Natural Heritage Area (pNHA)
- Eirk Bog Nature Reserve
- Eirk Bog SPA
- Derrycunihy Wood Nature Reserve

The proposed Core Areas are owned, in their entirety, by the State and are managed by the NPWS, primarily for long-term conservation purposes. The main conservation objectives for the Core Area, as outlined in the Killarney National Park Management Plan and Eirk Bog SPA Conservation Objectives, include:

- To conserve, and where possible enhance, the ecological value of all natural and semi-natural habitats and features.
- To conserve plant and animal species and to maintain their populations at adequate levels.
- To conserve and where appropriate, restore and further develop the cultural and heritage features.
- To encourage sustainable recreational and educational use, to provide information and facilities for visitors and to improve public awareness of its natural and cultural heritage.

- To establish and continue effective liaison with all parties with an interest in the management of these areas and to maintain a good relationship with the local community.
- To maintain the aesthetic and other qualities of the site.
- To undertake or facilitate research necessary to achieve the above objectives and to monitor the effectiveness of conservation management.
- To facilitate, promote and undertake scientific research within the UNESCO Biosphere Reserve.

The main challenges to conservation of resources include *Rhododendron* infestation, unsustainable numbers of deer and other livestock, pollution in Lough Leane, trespassing sheep, fire management and uncontrolled visitor usage.

The KNP Liaison Committee was established in 2000 to provide a forum for the views of local communities and interest groups in relation to the national park and biosphere reserve. It is intended that the Liaison Committee will continue as a key stakeholder forum in respect of KNP and it will be represented in the new governance framework proposed for the extended Kerry UNESCO Biosphere Reserve.

A Buffer Zone where only activities compatible with the management objectives can take place

A Buffer Zone was not defined in the KNP UNESCO Biosphere Reserve. The proposed Kerry UNESCO Biosphere Reserve Buffer Zone is approximately 24,010 ha.

The proposed Buffer Zone includes areas adjacent to the Core Area within the Lough Leane Catchment and the MacGillycuddy Reeks Mountain Range. Areas within the Buffer Zone are hydrologically linked or have habitat connectivity with the Core Area of the biosphere. This includes uplands, woodlands and freshwater habitats. In addition, conservation objectives complimentary to those within Core Area are in place within the proposed Buffer Zone.

All lands within the Buffer Zone are subject to national and international environmental designations, including:

- Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment SAC
- Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment pNHA
- Castlemaine Harbour SAC
- Doo Loughs pNHA

The primary conservation objective within the proposed Buffer Zone is to maintain or restore the favourable conservation condition of habitats and species listed in Annex I and II of the EU Habitats Directive.

The Buffer Zone, as proposed, does not entirely surround the Core Area. The national park adjoins Killarney town along its northern edge. These areas are dedicated to urban and commercial land uses and are not subject to any specific conservation requirements that support the Core Area. However, Killarney town is dependent on the national park economically and therefore, sustainable development is actively encouraged through the policies and plans of Kerry County Council. For these reasons, it was determined by the Kerry Biosphere Working Group (described below in this document) that Killarney town is more appropriately located in the biosphere's Transition Area, rather than Buffer Zone.

The proposed Buffer Areas are owned by private individuals or groups of individuals and are subject to a variety of uses including agriculture, tourism and recreation. However, only activities compatible with conservation objectives can take place in these areas through their designation under national legislation in the Natura 2000 network.

An outer Transition Area where sustainable resource management practices are promoted and developed

An outer Transition Area was not defined in the KNP UNESCO Biosphere Reserve. The proposed Kerry UNESCO Biosphere Reserve Transition Area is 31,380 ha.

The Transition Area incorporates other areas of the Lough Leane Catchment and the MacGillycuddy Reeks Mountain Range. These areas are hydrologically linked or have habitat connectivity with the Core Area of the biosphere. In addition, stakeholder engagement and sustainable management practices compatible with the objectives of the Core Area are promoted in these areas, most notably through the MacGillycuddy Reeks Mountain Access Forum and the Lough Leane Working Group (as described above).

Killarney town, immediately to the north of the Core Area, lies within the proposed Transition Area. The development of the town of Killarney has been based largely on the tourist industry, and it is of significance for the biosphere reserve that it immediately adjoins and is intimately associated with this tourist centre. An urban centre located in close proximity brings benefits such as the provision of services to accommodate research, education and tourism within biosphere. However, it also poses challenges such as road building, treatment and discharge of town sewage as well as housing and other building developments.

The Core Area of the biosphere reserve, KNP, represents a critical input to the economic and social prosperity and development of Killarney Town and the wider hinterland. For this reason, development within Killarney town is undertaken with the remit to conserve and protect the Core Area for present and future generations in accordance with the principle of sustainable development (as set out in the objectives of the Killarney Town Development Plan, explained in later sections of this report). Likewise, biosphere objectives will make every effort to facilitate the use of the Core Area for cultural, recreational, community and appropriate commercial use, as long as it complements the over-riding priority to provide for the conservation of its biodiversity.



Kerry UNESCO Biosphere Governance

It is proposed to strengthen existing structures and establish a new, consultative structure for the expanded Kerry UNESCO Biosphere Reserve. KNP will continue to be managed by the NPWS, as a national park, with its primary purpose being the conservation of biodiversity. For the broader Kerry UNESCO Biosphere Reserve, NPWS and Kerry County Council will be the principal partners and will form a Biosphere Management Council with the overall responsibility for management of the UNESCO Biosphere Reserve. This Council will be responsible for the development and implementation of the management policy for the biosphere reserve and ensuring that all goals and objectives are met. A dedicated Kerry Biosphere Reserve Officer (or officers) will be appointed and will report to the Council. This officer will be responsible for implementing actions as set out by the Council.

A Kerry Biosphere Advisory Comhairle will be established ("Comhairle" meaning "Council" in the Irish language), comprising stakeholders within the new wider biosphere. This Comhairle will provide a consultation forum for the various stakeholders and it will liaise with the Biosphere Management Council. Stakeholder engagement thus far has shown significant interest in participation on the Advisory Comhairle.

A separate Scientific Advisory Committee will also be established. This small committee will comprise representatives from third level institutions and from the Biosphere Management Council. It will be chaired by NPWS and may appoint other scientists on an ad-hoc basis as may be required. The committee will provide scientific advice in relation to the overall biosphere reserve, will work closely with the scientific structures for KNP and it will oversee a collaborative research direction for the wider biosphere reserve. In addition, it will administer a biosphere reserve scientific fund.

Key Commitments

The State has proactively managed KNP UNESCO Biosphere Reserve as a national park, pursuing the primary objective of conservation of biodiversity and supporting its use for tourism, recreation, amenity and education. To that end, it has invested in conservation and other projects, and in staff. A major intent of the new UNESCO Biosphere Reserve is to build on and strengthen conservation of biodiversity in line with the goals of the UN Convention on Biological Diversity and to pursue scientific endeavour in that regard.

The Biosphere Management Council, comprising Kerry County Council and NPWS, have pledged resources for a number of Kerry UNESCO Biosphere Reserve initiatives, including:

- A Kerry Biosphere Reserve Officer, responsible for stakeholder engagement, biosphere promotion and implementing actions as determined by the Management Council.
- A fund for administration and promotion of the Kerry UNESCO Biosphere Reserve, including set up and maintenance of a website, social media, newsletter, etc., as well as stakeholder meetings and communications.
- A scientific fund to assist scientific studies within the UNESCO Biosphere Reserve, including a bursary for two postgraduate students.
- An annual UNESCO Biosphere Conference, providing insight into UNESCO's World Network of Biosphere Reserves and highlighting ongoing work within the Kerry UNESCO Biosphere Reserve.
- Application for an EU LIFE (European Grant Funding) project examining the management of the uplands throughout the Kerry UNESCO Biosphere Reserve.
- An all-taxa biodiversity inventory of the Core Area of the Kerry UNESCO Biosphere Reserve, to be completed by 2020.
- A Biodiversity Plan for the Core Area, outlining options and priorities for conservation that reflect obligations under the UN Convention on Biological

Diversity, national and EU policies and legislation and UNESCO Biosphere Reserve processes, including:

- A review of *Rhododendron* eradication programme
 - A review of deer management,
 - A review of fire management,
 - A review of grazing.
- Continued commitment to the *Rhododendron* eradication programme, including a scientific peer review of the programme.
 - Completion of the Killarney House and Gardens Project, a valuable tourist attraction and interpretative centre will be open to the public in 2017.
 - A programme for capital investment to enhance tourism and interpretation in the Core Area, with a plan to include other areas of the Kerry UNESCO Biosphere Reserve.

In addition, the state commits that the Core Area of the Kerry UNESCO Biosphere Reserve will be a National Park in perpetuity.

PART I SUMMARY

(a) Name of the UNESCO Biosphere reserve:

Killarney National Park UNESCO Biosphere Reserve

The existing biosphere has been named since its designation in 1982. It is proposed to change the name to the Kerry UNESCO Biosphere Reserve to reflect proposed changes to the extent of the biosphere and to integrate KNP UNESCO Biosphere Reserve in its broader environmental and landscape context.

The name was proposed by the biosphere's two primary stakeholders, Kerry County Council and the National Parks and Wildlife Service. In addition, the name change was presented and approved during stakeholder consultation and engagement undertaken as part of this periodic review process. The change of name will facilitate participation of various stakeholders and members of the community who reside and work in the areas now covered by the proposed Kerry UNESCO Biosphere Reserve.

(b) Country:

Ireland

(c) Year of designation:

1982

(d) Year of periodic review:

This is the first periodic review.



Boola, Killarney National Park (credit: Kathryn Freeman)

(e) Previous recommendations of the International Co-Ordinating Council (MAB-ICC):

In previous correspondence, UNESCO informed NPWS that the first stage of exit strategies had commenced for the two Irish biosphere reserves, KNP UNESCO Biosphere Reserve and North Bull Island UNESCO Biosphere Reserve.

UNESCO informed NPWS that a periodic review was subsequently required for KNP UNESCO Biosphere Reserve and outlined a timeframe for same. UNESCO advised that the extent and zonation of the biosphere needed to comply with the Seville Strategy and the Madrid Action Plan.

(f) Follow-up actions completed:

In December 2016, an intention to retain biosphere designation was submitted to UNESCO. This comprised a summary of progress made within KNP UNESCO Biosphere Reserve since designation and proposed changes in scale and zonation in line with the Seville Strategy. UNESCO responded with comments and seeking a complete periodic review report. This report was prepared in response to this request.

In preparation of this periodic review report, a working group was established, comprising personnel from the NPWS, Kerry County Council and private consultants. This Periodic Review Working Group consisting of representatives from Kerry County Council, NPWS and MKO (private consultants) has gathered the information required to complete the review, undertaken stakeholder consultation and prepared this periodic review report.

Proposed changes in the extent and zonation of the biosphere as well as a change in the biosphere name were determined by the working group and refined through stakeholder engagement. These proposed changes are presented within this periodic review.

(g) Update on implementation of measures to achieve the objectives of the UNESCO Biosphere reserve:

Since designation, several measures have been implemented to achieve the objectives of the UNESCO biosphere:

Increased Regulation for Nature Conservation

Since designation in 1982, Ireland has ratified the UN Convention on Biological Diversity, CITIES, the EU Habitats Directive (92/43/EEC) and the EU Birds Directive (2009/147/EC). National legislation to give effect to this legislation has also come in to effect. There was a root and branch review and revision of the primary wildlife legislation in 2000.

All areas within the KNP UNESCO Biosphere Reserve were designated as part of Ireland's Natura 2000 network within the Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment SAC (Site Code 000365) and within the Killarney National Park SPA (Site Code 004038). As part of these designations, an assessment of the features of interest was undertaken and a series of conservation objectives were outlined.

In addition, Derrycunihy Woods within KNP UNESCO Biosphere Reserve was designated as a Statutory Nature Reserve in 1989 under Section 15 of the Wildlife Act, 1976 (SI No. 111/1989). This is a national designation that requires the nature reserve is managed to ensure conservation of the woodland ecosystem. This area also falls within the SAC designation.

Conservation designations have strengthened the objectives of the biosphere reserve and provided a statutory framework for their implementation. A key protection mechanism in the Habitats Directive is the requirement to undertake Appropriate Assessment in line with the requirements of Article 6(3) of the Directive. Appropriate Assessment considers the possible nature conservation implications of any plan or project on the Natura 2000 site network before any decision is made to allow the plan or project to proceed.

Increased Regulation of Invasive Species

The European Communities (Birds and Natural Habitats) Regulations 2011 (SI No. 477/2011) contain important provisions to address the problem of invasive species in Ireland. A list of invasive alien species is set out in the Third Schedule as well as Regulations prohibiting their introduction and dispersal. These Regulations bolster ongoing efforts to control invasive species within the biosphere reserve, most notably *Rhododendron ponticum*.

Increased Planning Protection and Development Controls

Planning legislation, the Planning and Development Act 2000-2015 and associated Planning and Development Regulations, has changed significantly in Ireland since biosphere designation in 1989. Ratification of several EU Directives into national planning law requires all plans and projects to comply with these Directives. These include the EU Habitats Directive, the Environmental Impact Assessment Directive (85/337/EEC as amended) and the Strategic Environmental Assessment Directive (2001/42/EC).

In addition, the Kerry County Development Plan (KCDP) provides a strategic framework and policy context for all local planning decisions. The KCDP has been subject to regular revisions since 1989. The most recent plan, the KCDP 2015-2021, lists several objectives and policies relating to development management within and surrounding the biosphere. These are described in Section 7 of this report.

Numerous views and prospects within KNP UNESCO Biosphere Reserve as listed for protection in the KCDP. The biosphere is also designated as a Prime Special Amenity, recognising that the landscape is very sensitive and requiring development to be highly controlled.

Numerous archaeological sites listed on the National Record of Monuments and Places occur within the biosphere, as well as historic buildings and structures recorded on the county's Register of Protected Structures and the National Inventory of Architectural Heritage. These are described further in Section 7 of this report. These designations add various layers of legislative protection through the Planning Acts and the National Monuments Act 1930-2004.

These designations – natural, cultural and landscape – support the objectives of the biosphere reserve and offers great potential for the attraction of visitors to explore the biosphere and has increased the desirability of people to reside in the area.

Management Plans

In 2005, NPWS published a "Management Plan for Killarney National Park 2005-2009". This management plan is included among the supporting documents and was prepared with significant scientific and also stakeholder engagement and aimed to communicate management strategies to stakeholders and the public. This management plan outlined a framework for the conservation of the natural and built heritage throughout the UNESCO Biosphere Reserve and provided a comprehensive overview of the history of the national park, its designations, historical, archaeological and ecological points of interest.

Freshwater Pearl Mussel (*Margaritifera margaritifera*) is listed on Annex II and Annex V of the EU Habitats Directive. It is also listed as one of the species for the protection of which the Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment SAC is designated (qualifying interest) As part of the implementation of the EU Water Framework Directive (2000/60/EC), individual management plans have been drafted for sub-catchments with known populations of pearl mussel. The Gearhameen sub-catchment falls within the KNP UNESCO Biosphere Reserve and its management plan outlines conservation objectives for the protection of Freshwater Pearl Mussel.

Developing Educational Resources

At the heart of the KNP UNESCO Biosphere Reserve is the Killarney National Park Education Centre based at Knockreer House in Killarney. It is run as an independent entity under the joint auspices of the NPWS and Kerry Education and Training Board. This strategic alliance between the UNESCO Biosphere reserve and the Education Centre has been a valued and productive one since 1989.

The national park authorities provide the educational facilities, including materials, while the Education Centre promotes course modules that convey a conservation message. The mission statement of the Education Centre is to "*run educational courses and activities based in KNP that will promote knowledge, understanding, enjoyment and appreciation of the natural environment for all*".

The center offers courses and activities both in the formal and non-formal education sectors. Primary pupils make up most students visiting the Education Centre. An annual in-service course for primary teachers, involving field trips to different habitats as well as workshops and lectures, are run during the summer months. Secondary schools are offered curriculum based courses for Leaving and Junior Certificate biology and geography courses. Transition year classes can also avail of courses covering habitats and management. Third level institutions are also provided for at the center. Tour groups and youth groups are also facilitated, as are the public and the corporate sector.

The ethos of the centre is based on a hands-on approach to learning about nature, and it is hoped that through this, the participant becomes more aware of the value of an unspoilt environment and the need for conservation. This approach integrates with the biosphere objectives for environmental education.

(h) Process of current periodic review:

The periodic review process involved initial consultations between UNESCO and NPWS and later, Kerry County Council. These discussions resulted in initial contacts being made with personnel with the Dublin Bay UNESCO Biosphere Reserve. Dr Jenni Roche, manager of the Dublin Bay Biosphere, was contacted and provided assistance in relation to this periodic review.

Attendance at a Biosphere Conference held in Dublin in October 2016, facilitated contact between Kerry County Council and UNESCO, namely Prof Martin Price (UNSECO Chair in Sustainable Mountain Development, Perth, Scotland) and Meriem Bouamrane (Division of Ecological and Earth Sciences MAB Programme, UNESCO, Paris).

A working group was established by NPWS and Kerry County Council to prepare this periodic review report. This Periodic Review Working Group comprised the NPWS, Kerry County Council and independent consultants, MKO. This working group has gathered the information required to complete the review, undertaken extensive stakeholder consultation and engagement regarding the changes required to form the new Kerry UNESCO Biosphere Reserve.

Maryann Harris and Prof Claire Cave of UCD's School of Biology and Environmental Science provided key advice and input to a peer review in relation to carrying out this periodic review.



Milkwort (credit: Kathryn Freeman)

Proposal to extend the UNESCO biosphere reserve and rename as the Kerry UNESCO Biosphere Reserve

UNESCO advice required a review of the extent and zonation within the KNP UNESCO Biosphere Reserve to comply with the Seville Strategy and the Madrid Action Plan. This review found the existing biosphere does not fulfil "Article 4 Criteria for UNESCO Biosphere Reserves" of the Seville Strategy, namely it does not apply appropriate zonation. The periodic review process stimulated discussions between NPWS and Kerry County Council and determined that zoning within the existing biosphere boundary would not be appropriate under current criteria.

It is proposed to retain and expand the existing UNESCO Biosphere Reserve as the Core Area to reflect lands in state ownership, primarily managed for long term nature conservation. In addition, to better meet UNESCO criteria, it is proposed to significantly expand the biosphere boundary to encompass Buffer and Transition Areas within the Lough Leane Catchment and MacGillycuddy Reeks mountain range (Figure 1.3).

This expansion adopts a hydrological and habitat management approach to achieving the objectives of KNP UNESCO Biosphere Reserve. Proposed Buffer and Transition Areas are hydrologically linked or have habitat connectivity with the Core Area of the existing biosphere. In addition, these areas demonstrate conservation objectives and sustainable management practices that support those within the existing biosphere reserve.

It is proposed to rename the newly defined biosphere the Kerry UNESCO Biosphere Reserve. The proposed expansion, zoning and name change has been discussed and approved during stakeholder consultation and engagement undertaken as part of this periodic review.

It is proposed to strengthen existing structures and establish a new, consultative structure for the expanded Kerry UNESCO Biosphere Reserve. KNP will continue to be managed by the NPWS, as a national park, with its primary purpose being the conservation of

biodiversity. For the broader Kerry UNESCO Biosphere Reserve, NPWS and Kerry County Council will be the principal partners and will form a Biosphere Management Council with the overall responsibility for management of the UNESCO Biosphere Reserve. This Council will be responsible for the development and implementation of the management policy for the biosphere reserve and ensuring that all goals and objectives are met. A dedicated Kerry Biosphere Reserve Officer (or officers) will be appointed and will report to the Council. This officer will be responsible for implementing actions as set out by the Council.

A Kerry Biosphere Advisory Comhairle will be established (“Comhairle” meaning “Council” in the Irish language), comprising stakeholders within the new wider biosphere. This Comhairle will provide a consultation forum for the various stakeholders and it will liaise with the Biosphere Management Council. Stakeholder engagement thus far has shown significant interest in participation on the Advisory Comhairle.

A separate Scientific Advisory Committee will also be established. This small committee will comprise standing representatives third level institution and from the Biosphere Management Council. It will be chaired by NPWS and may appoint other scientists on an ad-hoc basis as may be agreed. The committee will provide scientific advice in relation to the overall UNESCO Biosphere Reserve, will work closely with the scientific structures for KNP and it will oversee a collaborative research direction for the wider biosphere reserve. In addition, it will administer the UNESCO Biosphere Reserve scientific fund.

(i) Area and spatial configuration

The proposed Kerry UNESCO Biosphere Reserve extends over 65,760 ha (or 658 square kilometres) of terrestrial area. Due to its inland location, no marine areas are proposed. The proposed areas comprise areas of the Lough Leane catchment and the MacGillycuddy Reeks mountain range.

The proposed areas are large enough to meet the long-term conservation objectives of the Core Area and Buffer Zone. In addition, the Transition Zone, as proposed, is appropriate for working with local communities in testing and demonstrating sustainable uses of natural and cultural resources.

Area and spatial configuration

	Previous Report (nomination form or periodic review) and date)	Proposed Changes (if any)
Area of terrestrial Core Area	Total UNESCO Biosphere = 10,129ha	Core Area = 10,370 ha
Area of terrestrial Buffer Zone	0	Buffer Zone = 24,010 ha
Area of terrestrial Transition Area	0	Transition Area= 31,380 ha

(j) Human population of the UNESCO Biosphere Reserve:

	Previous Report (nomination form or periodic review) and date	At present (please state date of census or other source)
Core Area (permanent & seasonally)	458*	146
Buffer Zone (permanent & seasonally)	Not Applicable	224
Transition Area (permanent & seasonally)	Not Applicable	25451**

* Based on 1981 census data at the time of the KNP UNESCO Biosphere Reserve designation in 1982. Please note that census data has been refined since the 1980s and there will be discrepancies in how population figures have been recorded in recent national censuses. Direct comparisons for population figures are therefore difficult.

** Based on 2011 census data [<http://www.cso.ie/en/census/census2011reports/>]. Data from Ireland's recent 2016 census is not yet available but can be provided in due course as it becomes available if required by UNESCO.

(k) Budget

A budget was not previously outlined for the KNP UNESCO Biosphere Reserve.

The NPWS is responsible for the management of KNP and currently employs approx. 50 staff. An estimate of future budgets for the Core Area (KNP including Killarney House and Gardens as managed by NPWS) are provided.

- Current expenditure circa €1 million per annum
- Capital expenditure circa €500,000 - €2 million per annum.

In addition, Kerry County Council and NPWS have pledged resources (approx. €70,000) for management and initiatives specifically within the biosphere including:

- The appointment of a UNESCO Biosphere Reserve Officer
- A fund for outreach, administration and promotion of the UNESCO Biosphere Reserve
- A scientific fund to assist scientific studies within the UNESCO Biosphere, including a bursary for two postgraduate students.

(l) International, regional, multilateral or bilateral framework of cooperation:

The proposed Kerry UNESCO Biosphere Reserve will contribute to the implementation of a range of international, regional, multilateral and bilateral frameworks of co-operation. The following is a non-exhaustive list:

- Convention on Biological Diversity
- Bern Convention on the Conservation of European Wildlife and Natural Habitats
- Bonn Convention on the Conservation of Migratory Species of Wild Animals
- EUROBATS
- EU Habitats and Birds Directives
- CITES
- Water Framework Directive
- EU LIFE Project – Kerry Life Project on the conservation of Freshwater Pearl Mussel in the Blackwater (Kerry) Catchment SAC
- BirdWatch Ireland Bird Atlas
- Research agreements with national and international universities

PART II PERIODIC REVIEW REPORT

1 UNESCO BIOSPHERE RESERVE: KILLARNEY NATIONAL PARK UNESCO BIOSPHERE RESERVE, IRELAND

1.1 Year designated

1982

1.2 Year of first periodic review and of any following periodic review

Not applicable as this is the first periodic review.

1.3 Follow-up actions taken in response to each recommendation from previous periodic reviews

Not applicable as this is the first periodic review.

1.4 Other observations or comments on the above

Not applicable as this is the first periodic review.

1.5 Process of periodic review

1.5.1 Stakeholders

Initial discussions regarding the Periodic Review of the KNP UNESCO Biosphere Reserve were held between the NPWS and UNESCO and later Kerry County Council. During these initial discussions, it became apparent that certain changes to the existing KNP UNESCO Biosphere Reserve would be required to adequately correspond with the criteria set out in the Seville Strategy. Fundamentally, the expansion of the reserve to include Buffer and a Transition Zones would be required.

It was also decided at the outset to pursue extensive stakeholder consultation with regard to the proposal for the expanded UNESCO Biosphere reserve. An expansion of the UNESCO Biosphere reserve, covering a much larger area and affecting numerous landowners and interest groups, would require considerable stakeholder engagement.

At this point, a working group consisting of personnel from the NPWS and Kerry County Council was set up and a summary paper produced in support of the periodic review. These two bodies are the primary stakeholders in the proposed Kerry UNESCO Biosphere Reserve. A private consultancy (McCarthy Keville O'Sullivan (MKO)) was also included on the working group to assist with gathering and collating relevant information, consultation and engagement with the wider group of stakeholders and preparation of periodic review document. The following table shows details of the members of staff that were included on the working group and are responsible for the preparation of the periodic review.

Members of the Periodic Review Working Group

Name	Position	Organisation
Damien Ginty	Planning	Kerry County Council

Cathy Fisher	Biodiversity Officer	Kerry County Council
Dr Philip Buckley	Divisional Manager	NPWS
Pat Dawson	Regional Manager	NPWS
Frank McMahon	District Conservation Officer	NPWS
Dr. Jervis Good	Divisional Ecologist	NPWS
Sarah Ui Bhroin	Assistant Director	NPWS
Dr. Una Nealon	Environmental Consultant	McCarthy Keville O’Sullivan
Dr. Inga Reich	Environmental Consultant	McCarthy Keville O’Sullivan
Pat Roberts	Environmental Consultant	McCarthy Keville O’Sullivan
Sarah Hill	Planning Consultant	McCarthy Keville O’Sullivan
Gus McCarthy	Planning Consultant	McCarthy Keville O’Sullivan

In addition to the bodies that are included on the Periodic Review Working Group, a wide variety of key stakeholders were consulted as part of the review process. Stakeholder engagement is an ongoing priority of the Kerry UNESCO Biosphere Reserve. The process so far has involved the following groups:



Small Tortoiseshell (credit: Kathryn Freeman)

Killarney National Park Liaison Committee

This group was set up in 2000 to liaise with the NPWS regarding KNP. The group represents a range of different groups from the following sectors: Conservation, Recreation, Commercial and Education. The group meets monthly and is primarily associated with the proposed Core Area of the UNESCO Biosphere reserve. Representatives on the forum have changed over the years, with groups joining or stepping down. The groups that are represented on this forum, as of April 2017, are shown the following table.

Killarney National Park Liaison Committee

Sector	Organisation
--------	--------------

Local Authority	Kerry County Council
Conservation	An Taisce
	Killarney Nature Conservation Group
	Killarney Environs Protection Group
	Muckross Trustees
	Red Deer Society
Recreation	Lough Leane Anglers
	Killarney Rowing Clubs
	Killarney Salmon & Trout Angling Group
	Muckross Rowing Club
	Walking Group
Commercial	Commercial Boatsmen Assoc.
	Killarney Chamber of Commerce
	Killarney Town Jarveys
	Ross Castle Boatsmen Assoc.
Community	Disability Access Group
	Muckross Community Assoc.
	Water Rescue Group
Education	Killarney Girl Guides
	KNP Education Centre, Knockreer
	St. Olivers National School



Muckross House & Gardens (credit: Kathryn Freeman)

Lough Leane Working Group

The Lough Leane Working Group was established in 1997, to co-ordinate efforts to monitor and manage water quality within the Lough Leane catchment. The working group comprises representatives from local authorities, statutory bodies, land users and local interest groups. This group is primarily associated with the buffer and Transition Zone of the UNESCO

Biosphere reserve. The groups that are represented on this forum are shown the following table.

Lough Leane Working Group

Sector	Organisation
Local Authority	Kerry County Council
	Killarney Town Council
Statutory Bodies	Health Service Executive
	The Forest Service
Conservation	NPWS
	An Taisce
	EPA
	Killarney Water Conservation Group
Agriculture	Teagasc
	Department of Agriculture & Food
	Kerry IFA
	Kerry ICMSA
	South Western Regional Fisheries Board
	Coillte Forest
Commercial	Fáilte Ireland South West
	Killarney Chamber of Tourism & Commerce
	Randles Court Hotel
Recreation	Lough Leane Anglers
	Munster Regional Trout Angling Council
	Killarney Salmon & Trout Angling Club

MacGillycuddy Reeks Mountain Access Forum

The MacGillycuddy Reeks Mountain Access Forum was established in 2014 to protect, manage and sustainably develop Ireland's highest mountain range, the iconic MacGillycuddy Reeks. Initiatives underway include habitat restoration and trail repair, stakeholder engagement, fundraising, landowner training in trail repair and guiding, recreation use monitoring, trail condition monitoring and website development.

The group, primarily associated with the buffer and Transition Areas of the proposed Kerry UNESCO Biosphere Reserve, comprise representatives from local government, statutory bodies, community groups, landowners and recreational users. The following table outlines the individual groups represented:

MacGillycuddy Reeks Mountain Access Forum

Sector	No. of Representatives
Local Elected Landowners	7
Elected Community representatives	3
Elected Local Guides representative	1
Elected Small Business representative	1
Elected Recreational Users	2
South Kerry Development Partnership's Rural Recreation Officer	1
Department of Environment, Community & Local Government (Rural Recreation Section)	1
National Parks & Wildlife Service representative	1
Kerry County Councillor	1
Kerry County Council representative	1
Fáilte Ireland representative	1

Education Providers

Educators within the following institutions were contacted and invited to comment on the KNP UNESCO Biosphere Reserve and the proposed Kerry UNESCO Biosphere Reserve:

- KNP Education Centre
- University College Cork
- Institute of Technology, Tralee
- National University of Ireland, Galway
- Trinity College Dublin
- University College Dublin
- University of Limerick
- National University of Ireland, Maynooth
- Limerick Institute of Technology
- Sligo Institute of Technology

Other Stakeholders

In addition to the above, representatives from local government, statutory bodies, commercial organisations and environmental non-governmental organisations were specifically contacted. These included:

- Irish Wildlife Trust
- Groundwork
- The Forest Service of the Department of Agriculture, Food and the Marine
- Coillte
- Killarney Chamber of Tourism and Commerce
- Municipal District of Killarney
- Municipal District of South & West Kerry

1.5.2 Methodology for stakeholder involvement

A variety of processes were used to engage with stakeholders.

Presentations were delivered to groups, explaining the UNESCO World Network of Biosphere Reserves, the periodic review process and proposals for the expanded Kerry UNESCO Biosphere Reserve. Representatives from the following groups attended:

- Municipal District of Killarney
- Municipal District of South & West Kerry
- Killarney Chamber of Tourism and Commerce
- MacGillycuddy Reeks Mountain Access Forum
- KNP Liaison Committee
- Coillte

Feedback was sought and received at these presentations. In addition, representatives were provided with hard and soft copies of the presentation and an information leaflet and were asked to share with their colleagues. Contact details for the Periodic Review Working Group were provided with an invitation for comments or queries.

Consultation meetings were also undertaken with individual stakeholders. Feedback was sought and received during these meetings. Stakeholders were also provided with details to later contact the Periodic Review Working Group.

- Irish Wildlife Trust
- Groundwork
- Lough Leane Working Group

A number of stakeholders were also consulted directly. These included:

- The Forest Service of the Department of Agriculture, Food and the Marine
- KNP Education Centre
- All third level institutions

In addition, a press release was issued to local media, describing the UNESCO World Network of Biosphere Reserves, the periodic review process and the proposed Kerry UNESCO Biosphere Reserve. The press release was sent to the following local media:

- Radio Kerry
- Kerryman
- Kerry's Eye
- Outlooks
- Tralee Today
- Killarney Today

Some samples of media coverage are provided in the Supporting Documents to this report.

1.5.3 Number of meetings held

A total of five presentations and numerous meetings were held during the periodic review consultation process.

It is intended that an ongoing public consultation procedure will be held over the coming months as the expansion of the UNESCO Biosphere reserve is undertaken. Whilst the initial responses to the consultation undertaken so far has been overwhelmingly positive, it will be appropriate to hold further detailed engagement with the stakeholders as the roles and responsibilities of each are fully developed and the promotion and development of the UNESCO Biosphere reserve is pursued. This will take the form of several meetings of the key stakeholders to form a Kerry UNESCO Biosphere Reserve Advisory Comhairle. In addition, it is intended to hold several open days, family workshops and on-line surveys along with a new website and marketing material to launch the Kerry UNESCO Biosphere Reserve. The opinions, thoughts and wishes of all stakeholders will be considered during the development of the Kerry UNESCO Biosphere Reserve.



Betony - Red Data sp. (credit: Kathryn Freeman)

1.5.4 Details of attendance and quality of representation

In designing the process for public consultation, the Periodic Review Working Group, carefully selected appropriate forums to include the maximum number of stakeholders possible from as wide a range of user groups as possible. The presentations were well attended with the key stakeholders either present or represented by an ambassador. Sign in sheets and comment record sheets were circulated during presentations.

A list of attendees at various presentations and meetings is provided in the Supporting Documents to this report. A full list of member of the various forums is also included.

Where it was felt that certain groups were not represented or had not attended one of the presentations, this was identified by the working group and specific efforts were made to meet with and consult with these groups individually. Following this method, a comprehensive public consultation and stakeholder engagement has been completed in relation to this periodic review.

2 SIGNIFICANT CHANGES IN THE UNESCO BIOSPHERE RESERVE DURING THE PAST TEN YEARS

2.1 Summary

During the past decade, there has been no material change in land use of the existing KNP UNESCO Biosphere Reserve. Population growth within the Killarney national park UNESCO Biosphere reserve has been negative as lands are in State ownership and managed for nature conservation.

One of the most significant changes within KNP UNESCO Biosphere Reserve is its designation within the Natura 2000 network. Management policies have focused on eradication programme for invasive species, water monitoring, control of grazers and control of visitor numbers and erosion.

The key economic activities within the reserve is tourism, recreation and amenity, and although numbers of tourists were lower during the period of economic recession (2009 – 2012), they are rising again. Key main changes in the area of development relate to increased pressure from recreation and investment in cultural features.

The KNP UNESCO Biosphere Reserve has fulfilled the logistic support function through continued programmes of conservation, development, education and research to advance the knowledge of natural history, geography and culture. Key partners have outlined UNESCO Biosphere objectives and pledged additional resources for their implementation in the Kerry UNESCO Biosphere Reserve.

2.2 Updated background information

The boundaries and land ownership of the KNP UNESCO Biosphere Reserve have remained largely the same since the establishment of the UNESCO Biosphere reserve in 1982. The reserve is synonymous with the National Park and is entirely within the ownership of the State.

As this site remains and will continue to be a national park in the future, it is afforded the highest level of protection for biodiversity in the state of Ireland. National Parks are entirely State-owned and for the primary purpose of nature conservation.

There have been no significant changes to the management regime within the UNESCO Biosphere reserve during this period. The Local Authority that governs the area remains Kerry County Council. A small section of the reserve was in the jurisdiction of Killarney Town Council, which was abolished in 2014 and is now part of Kerry County Council. This is not considered to be significant in the context of the UNESCO Biosphere reserve.

The European Designations within the UNESCO Biosphere Reserve have remained the same in the last 10 years with much of the UNESCO Biosphere reserve being within both the Killarney National Park SPA and the Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment SAC. Whilst this legislation has not changed fundamentally in the past decade, the implementation thereof and level of protection afforded to the protected habitats and species has increased greatly.

In the period 2009-2016, there was a reduction in funding due to economic conditions, this had implications for the budget for the management of KNP.

2.2.1 Updated coordinates

The KNP UNESCO Biosphere Reserve remains as it was at its establishment with no changes to the coordinates. The coordinates of the proposed Kerry UNESCO Biosphere Reserve are provided below and are presented in Figure 1.3.

Kerry UNESCO Biosphere Reserve Coordinates

Cardinal points	Latitude	Longitude
Most central point	52.0445	-9.4703
Northernmost point	52.1644	-9.3074
Southernmost point	51.9209	-9.5708
Easternmost point	51.9977	-9.1192
Westernmost point	52.0007	-9.8186

2.2.2 Updated map

The proposed Kerry UNESCO Biosphere Reserve expands the boundary of the existing KNP UNESCO Biosphere Reserve to include a Buffer and Transition Zone. A full description of the rationale for the area of the proposed Kerry UNESCO Biosphere Reserve is provided in the Overview section of this report along with a map (Figure 1.3). Digital maps and shape files are provided to accompany this report.

2.2.3 Changes in the human population of the UNESCO Biosphere reserve

Preliminary results of the 2016 Census have been published but they are restricted to County level populations, which do not reflect any changes which may have occurred within the UNESCO Biosphere area. Nonetheless, referring to the 2016 data available as an indicator of general trends, the County has experienced population growth of 10% over a 14-year period from 132,527 in 2002 to 147,707 in 2016.

Population Change in Kerry County (Source: Central Statistics Office)

	2002	2006	2011	2011	2016
Population Kerry County	132,527	139,835	145,502	146,003	147,707

The forgoing analysis is thus based on the available population data from the Central Statistics Office between 1991 and 2011.

Killarney town and its environs, as per the boundary of the Killarney Town Development Plan 2009-2015 as shown on Figure 2.1 below, extends to approximately 1,155 hectares which is located entirely within the Transition Area of the UNESCO Biosphere. It has a population of 14,219 (2011) which is the highest population for the UNESCO Biosphere area. The population has increased by 30% over the twenty-year period from 9,950 in 1991 to 14,219 in 2011. The population peaked at 14,603 in 2006 which was the peak of the economic boom in Ireland.

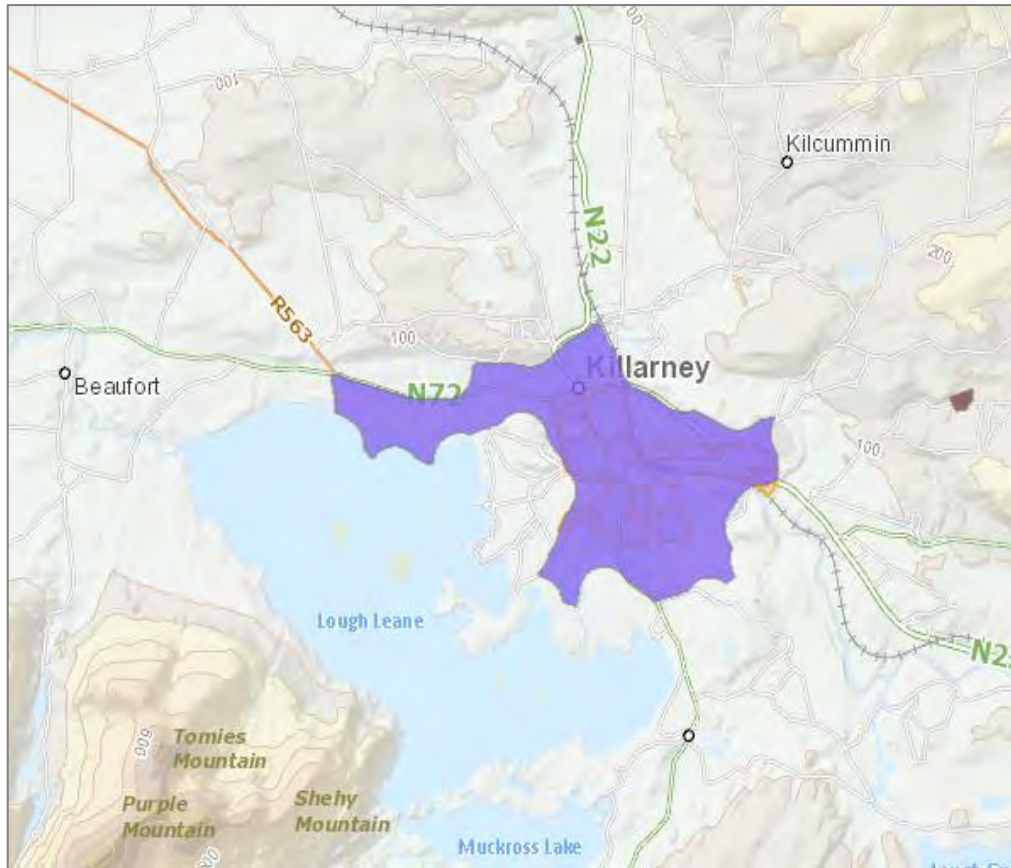


Figure 2.1: Killarney Town Development Plan Area

Population Change in Killarney Legal Town and its Environs (Source: Central Statistics Office)

	1991	1996	2002	2006	2011
Population Killarney legal town and its environs	9,950	12,011	13,137	14,603	14,219

The Buffer Area of the UNESCO Biosphere is sparsely populated with a population of 224 (2011). Historical information relating to population for the Buffer Area of the UNESCO Biosphere is based on electoral divisions (ED). The boundaries of ED's overlap between Core and Transition Areas and thus, the census data is not a clear indicator of population in either. Therefore, to generate an idea of population trends in the Buffer Area over the period 2002 to 2011, two electoral divisions are selected and analysed below.

The Clydagh ED sits in the eastern portion of the UNESCO Biosphere. It includes both Transition and Buffer Areas. The changes in its population between 2002 and 2011 and illustrated in the table below. A review of aerial photography indicates that the population in this ED is located mainly within the Transition Area. Nonetheless, what the data below does illustrate is that the Buffer Areas have experienced minor increases in population over a 9-year period.

Population Growth in Sample Electoral Division within the UNESCO Biosphere Buffer Area (Source: Central Statistics Office)

	2002	2006	2011
Population Clydagh (ED ref.no. 19068)	119	126	128

The Core Area of the UNESCO Biosphere has a population of 146 across 32 townlands (2011). Given the State ownership of the park, a significant majority of this population will be temporary tourist populations. Historical information relating to population for the Core Area of the UNESCO Biosphere is not available. Nonetheless, in line with trends in the Buffer Area, it can be assumed that growth will be negative, based on the State ownership of the National Park.

In summary, County Kerry, and the town of Killarney (Transition Area) have experienced population growth since the UNESCO Biosphere reserve was approved in 1982. The population of the Core Area of the UNESCO Biosphere is sparse and in the absence of historical data of population change it can be assumed that its growth is minimal.

2.2.4 Update on conservation function

The KNP UNESCO Biosphere Reserve is and will continue to be a national park in the future, it is afforded the highest level of protection for biodiversity in the state of Ireland. National parks are entirely State-owned and are managed for the primary purpose of nature conservation.

Designation as part of the Natura 2000 Network

One of the primary changes since the establishment of the UNESCO Biosphere reserve as regards the conservation function is the designation of almost the entire area as part of the Natura 2000 network of designated sites. KNP was designated for conservation as part of the Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment SAC in 1997. It was also designated as the Killarney National Park SPA in 1995. Whilst this was not within the last 10 years, it has led to the strict protection of a range of habitats and species (and their supporting habitat) under the EU Habitats and Birds Directives respectively. More details on the protected habitats and species are provided in Section 4 (Conservation Function).

Removal of Invasive and Non-Native Species

The KNP UNESCO Biosphere Reserve was (and still is) heavily infested with Rhododendron. Ongoing and proactive management for the removal of invasive species (primarily *Rhododendron ponticum*) from the woodlands and peatlands of KNP UNESCO Biosphere Reserve has led to one of the primary changes to the conservation function of the reserve through the restoration and improvement of these sensitive and in many cases protected habitats. This management is ongoing. Full details are provided in Section 4.

Water Monitoring

Nutrient inputs which arise outside the park have caused (in particular) Lough Leane and its catchment area to be threatened by eutrophication. In response to this a programme of ongoing water quality monitoring has been undertaken throughout the lakes and rivers within and surrounding the reserve. This is undertaken on a regular basis (summer: weekly/fortnightly, depending on the waterbody being sampled; winter: monthly). Monitoring of the effluent discharge from Muckross sewage treatment plant to Lough Leane is done on a similar basis. Ongoing liaison between various stakeholders within the Leane Catchment including Kerry County Council has led to an improvement in water quality within the catchment. Full details are provided in Section 4 (Conservation Function).

Control of Grazers

Large herds of Red and Sika Deer along with Feral Goats and Sheep (trespassing) have led to overgrazing particularly in the woodlands and lowland bogs. This has had a major impact on woodland regeneration and is still an ongoing issue and will require further initiatives ongoing management and monitoring to resolve despite the efforts undertaken thus far by the NPWS.

Erosion and visitor Control

Increases in visitor numbers to KNP have led to impact as a result of trampling and erosion of sensitive habitats in localised areas. This has been managed by the construction of footpaths, boardwalks, trail repairs and monitoring of trail use and condition.

2.2.5 Update on the development function

The key economic activity within the reserve is tourism, recreation and amenity and although numbers of tourists were lower during the period of economic recession (2009 – 2012), they are rising again (details provided in Section 5 of this report). It has been noted that, one of the main changes associated with tourism is an increase in outdoor pursuits activity, which has led to increased pressures resulting from erosion, disturbance and litter etc. in the wild areas of the UNESCO Biosphere reserve. There have been a number of strategies employed to deal with this, as described above and in Section 5 (Development Function). Management is ongoing to ensure that the Development Function of the site is wholly compatible with the overriding Conservation Function.

Other changes within and surrounding the reserve in recent times include the refurbishment of Killarney House and Gardens by NPWS as a new visitor and interpretive centre due to open in 2017. Several other works have also been going on within the reserve over the past decade as well, mostly concerning renovations and further developments of historical buildings such as Killarney and Muckross House or Ross Castle. Additionally, facilities for visitors (e.g. walking paths, car parks, toilet blocks) are being extended with a focus on accommodating disabled or elderly visitors as well as children. This has increased the tourism potential of the reserve and helped to fulfil its development function.

2.2.6 Update on logistic support function

The KNP UNESCO Biosphere Reserve has fulfilled the logistic support function through continued programmes of education and research to advance the knowledge of natural history, geography and culture. Research and monitoring activities in KNP are mostly carried out by state bodies or universities and institutes of Technology (ITs), generally located within the country but also from outside Ireland/ Europe (e.g. Spain (thesis from Julia Herreros Victoria, Valencia Polytec University, about the Wild Atlantic Way which includes a section on KNP) or England (thesis from Noel Raymond, Manchester Metropolitan University, on the ecology and performance of Japanese Sika Deer and their impact on vegetation in KNP).

Details of the numerous institutions who regularly carry out monitoring and research within the reserve along with the types of studies undertaken are provided in Section 6 (Logistic Function) of this report. These programmes are ongoing and will continue to be encouraged by the Reserve. It is intended that a key priority and focus of the expanded UNESCO Biosphere will be to pursue greatly enhanced scientific endeavor. As part of this, it is intended to establish the Core Area as a “Biodiversity Reference Site” and to prepare an all-taxa biodiversity inventory. Also, it is intended to make financial provision for ongoing research as part of the UNESCO Biosphere Reserve budget.

The KNP Education Centre (<http://www.killarneynationalpark.ie/education-centre>) runs environmental and ecologically based courses for all age groups and abilities. The main educational institutions which are dealt with are Primary and Secondary Schools, colleges, universities and institutes of technology. All courses help to create environmental awareness, foster an appreciation of the outdoors and an awareness of the biodiversity which occurs within the KNP UNESCO Biosphere Reserve and how this can be conserved.

More details of how the KNP UNESCO Biosphere Reserve Logistic Function is fulfilled are provided in Section 6.

2.2.7 Update on governance management and coordination

The NPWS (a fully integrated division of the Heritage division of the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs) have been the primary governing body for the UNESCO Biosphere reserve since its establishment. The NPWS of the Department is responsible for the management of KNP and currently employs approx. 50 staff for the purposes of conservation management, maintenance, agricultural management of habitats and land areas, public education, recreation and tourism management within the existing KNP UNESCO Biosphere Reserve.

A KNP Liaison Committee was established in 2000. This group was set up as a forum for various stakeholders to liaise with NPWS regarding KNP. It meets with NPWS monthly. This liaison committee includes representatives from a wide range of relevant stakeholders and discusses matters relating to the National Park (UNESCO Biosphere Reserve). These include among others, anglers, hill walkers, environmental groups such as An Taisce, forestry organisations and public access groups.

In the future, with the expansion and the development of the Kerry UNESCO Biosphere Reserve, a management council that is specific to the UNESCO Biosphere reserve will be required. The Kerry UNESCO Biosphere Reserve will no longer be synonymous with Killarney National Park and will no longer be primarily in the ownership of the State. It will therefore require a dedicated and expanded regime for governance.

Whilst responsibilities for the management of the National Park will remain as it is at present, a separate and dedicated Kerry Biosphere Management Council will be formed. This will reflect the wider area covered by the Kerry UNESCO Biosphere Reserve.

The proposed governance and consultation framework of the expanded Kerry UNESCO Biosphere Reserve is explained in greater detail in Section 7 (Governance).

2.3 The authorities in charge of managing the UNESCO Biosphere reserve

2.3.1 Updates to management policy

The expanded Kerry UNESCO Biosphere Reserve supports the following goals and objectives for the Core Area:

- To fully reflect the obligations and goals of UNESCO Biosphere reserves as outlined in the Seville Strategy.
- To fully reflect the objectives of the UN Convention on Biological Diversity.
- To conserve, and where possible enhance, the ecological value of all natural and semi-natural habitats and features.
- To conserve notable plant and animal species and to maintain their populations at adequate levels.
- To conserve and where appropriate, restore and further develop the cultural and heritage features.
- To encourage sustainable recreational and educational use, to provide information and facilities for visitors and to improve public awareness of its natural and cultural heritage.
- To establish and continue effective liaison with all parties with an interest in the management of these areas and to maintain a good relationship with the local community.
- To maintain the aesthetic and other qualities of the site.
- To undertake or facilitate research necessary to achieve the above objectives and to monitor the effectiveness of conservation management.
- To facilitate, promote and undertake scientific research within the UNESCO Biosphere Reserve.

- To establish the Core Area as a "Biodiversity Reference Site".

The Buffer and Transition Areas will provide a support function to these goals and all activities within these areas will be compatible with the overall objectives and will serve to protect the Core Area of the UNESCO Biosphere Reserve.

It will be the responsibility of the Biosphere Management Council to ensure that the achievement of these goals is provided for in a defined management policy encompassing the entire area of the UNESCO Biosphere Reserve.



Clouded Yellow (Credit: Kathryn Freeman)

2.3.2 Budget and staff support

A budget was not previously outlined for the KNP UNESCO Biosphere Reserve.

The NPWS is responsible for the management of KNP and currently employs approx. 50 staff. An estimate of future budgets for the Core Area (KNP including Killarney House and Gardens as managed by NPWS) are provided.

- Current expenditure circa €1 million per annum
- Capital expenditure circa €500,000 - €2 million+ per annum.

In addition, Kerry County Council and NPWS have pledged resources (approx. €70,000) for management and initiatives specifically within the UNESCO Biosphere including:

- The appointment of a UNESCO Biosphere Reserve Officer
- A fund for outreach, administration and promotion of the UNESCO Biosphere
- A scientific fund to assist scientific studies within the UNESCO Biosphere, including a bursary for two postgraduate students.

2.3.3 Communications strategy for the UNESCO Biosphere reserve

Aside from the ongoing management of KNP as the Core Area of the UNESCO Biosphere reserve, a dedicated Biosphere Management Council will be set up. A UNESCO Biosphere Officer will be employed. This officer will be based in Kerry County Council offices and will have office space and access to all the necessary office support and facilities. A Biosphere Management Council will be set up immediately following adoption of the Kerry UNESCO Biosphere Reserve and a dedicated officer will be employed very shortly thereafter.

The Management Council and UNESCO Biosphere Officer will be responsible for both internal and external communication with regard to the UNESCO Biosphere. They will be responsible for:

- Producing promotional material and information for the UNESCO Biosphere and related activities.
- Encouraging public ownership of the Kerry UNESCO Biosphere Reserve.
- Promoting the Kerry UNESCO Biosphere Reserve Brand.
- Ensuring effective communication in relation to stakeholder engagement in the management planning process.
- Ensuring that all committee members are fully briefed in the day to day management of the reserve.
- Ensuring all management policies, research papers and any other UNESCO Biosphere related documents are readily available.
- Collection and ensuring availability of wildlife records.

The above objectives will be achieved by the following means:

- Creation of a website to hold publicly available information about the Kerry UNESCO Biosphere Reserve at a central location and to provide updates about ongoing research, guidelines, upcoming events and other matters of UNESCO Biosphere interest.
- Creation of on-line blogs, Facebook and Twitter feeds to provide up to date information on relevant and interesting topics.
- Production of a newsletter or e-zine.
- Where appropriate use press releases etc. for advertising.
- Hold public information days and meetings to promote and encourage support and engagement in the UNESCO Biosphere Reserve.
- Hold UNESCO Biosphere related family events to promote the conservation and community objectives of the UNESCO Biosphere Reserve.
- Hold regular meetings between all members of the Biosphere Management Council.
- Provide a forum for complaints and conflict resolution either on-line or in person.
- Production of promotional material such as banners, hats, badges, flags, information leaflets etc.
- Creation of a Kerry UNESCO Biosphere Reserve Brand with a logo. This can be used as a promotional tool not just for the core objectives of the UNESCO Biosphere Reserve but also as a much larger marketing tool in wide variety of situations. Following adoption of the Kerry UNESCO Biosphere Reserve, a budget will be made available for this branding.

It is envisaged that all the measures described above would be implemented in at least the first year following adoption of the expanded Kerry UNESCO Biosphere Reserve.

2.3.4 Strategies for fostering networks of cooperation

The NPWS liaise extensively with a wide range of user or interest groups in the course of the management of KNP. There is extensive interaction between stakeholders, landowners and

interest groups, including a dedicated KNP Liaison Committee comprising a diverse range of groups representing a wide section of the community.

The KNP Education Centre (<http://www.killarneynationalpark.ie/education-centre>) runs environmental/ecologically based courses for all age groups and abilities. The main educational institutions which are dealt with are Primary and Secondary Schools, Colleges, Universities and Institutes of Technology. The education centre caters for a very diverse range of people and communities.

There are regular events for a wide range of interest groups including families, naturalists, historians, children and other interest groups. These are regularly advertised on the KNP Website.

In the future with the Kerry UNESCO Biosphere Reserve, an increased level of public engagement, especially within the Buffer and Transition Zones, is now proposed with the establishment of a UNESCO Biosphere Advisory Comhairle. This will foster increased participation and coordination in the areas outside the Core Area of KNP. In addition, there will be a greatly increased role for KCC in the revised UNESCO Biosphere, with increased involvement from democratically elected representatives of the community.

The Kerry UNESCO Biosphere Reserve will also involve other members of the local community through events, blogs, e-zines and as part of the management policy data gathering operations.



KNP Education Centre, Knockreer House (credit: Chris Barron)

2.3.5 Approaches adopted for addressing the socio-cultural context

It is the policy of KNP and the Kerry UNESCO Biosphere Reserve to engage as wide and diverse a range of socio-economic and ethnic groups as possible. The strategies for achieving this are discussed above. The promotion of heritage, history and cultural

resources within the reserve is promoted and protected through the various local authority plans in the area

2.3.6 Use of traditional and local knowledge in management

Local knowledge is used in the management of the UNESCO Biosphere through stakeholder engagement, namely the KNP Liaison Committee. Members represent local interest groups from Conservation, Recreation, Commercial and Education. The group meets monthly. Involvement of local interest groups from a diverse range of backgrounds ensures local history and knowledge is transmitted in a variety of forms.

KNP UNESCO Biosphere Reserve promotes sharing of traditional and local knowledge through several its initiatives. KNP Education Centre runs educational courses and activities within the UNESCO Biosphere, promoting knowledge and understanding of the unique natural environment. KNP UNESCO Biosphere Reserve also runs a series of cultural events, most notably during the annual Heritage Week. These events promote local history, storytelling, local crafts, traditional music and dance, etc.

The nucleus of KNP UNESCO Biosphere Reserve is Muckross House and Gardens, a magnificent Victorian mansion and one of Ireland's leading stately homes. Muckross House is home to a number of skilled craft workers who can be viewed using traditional skills in the crafts of weaving, bookbinding and pottery in the adjacent walled garden centre. Also within the grounds, the Muckross Traditional Farms are a recreation of a rural townland in 1930's Ireland. They are actual working farms, complete with people and animals. A number of other sites of particular cultural importance are maintained within the UNESCO Biosphere and are open to the public including Ross Island and Castle, Innisfallen Island, etc.

In the future, the proposed Kerry UNESCO Biosphere Reserve will continue and expand local stakeholder engagement. In addition, the Biosphere Management Council are committed to maintaining features of the UNESCO Biosphere that promote traditional and local knowledge and pledge to further develop these in the expanded UNESCO Biosphere. Killarney House and Gardens, a major restoration project, will open in 2017. The house will be an interpretative centre.



Muckross Weaving (credit: www.muckross-house.ie)

2.3.7 Community cultural development initiatives

Under the Official Languages Act, Irish is the first language of Ireland. Information and signage within the UNESCO Biosphere is communicated in both English and Irish. All interpretative material is also bilingual.

Several features of the UNESCO Biosphere include early religious sites. As described in the preceding section, cultural values and customary practices are promoted through various initiatives within the UNESCO Biosphere, e.g. traditional farms within Muckross House and Gardens.



Milking by hand – Muckross Traditional Farms (credit: www.muckross-house.ie)

2.3.8 Languages spoken and written in the UNESCO Biosphere reserve – changes and revitalization

While Irish is the official language of Ireland, it is spoken as a first language by a minority of people. Gaeltachts are districts where the government recognises that the Irish language is the predominant vernacular. No Gaeltacht areas fall within KNP UNESCO Biosphere Reserve or the proposed Kerry UNESCO Biosphere Reserve. However, the Kerry Gaeltacht, comprising Corca Dhuibhne and parts of the Iveragh Peninsula, are located west of the UNESCO BR. In addition, the Cork Gaeltacht, comprising Muscraí and Oileán Chláire, is located to the east and south of the UNESCO Biosphere. The Kerry Gaeltacht and the Cork Gaeltacht collectively comprise 19% of all Gaeltacht areas within Ireland.

The most recent edition of UNESCO's "Atlas of the World's Languages in Danger" classified Irish as "definitely endangered". The status has since been improved to "vulnerable", in light of information about the measures taken by Government to support the language in recent years. In "A 20-Year Strategy for the Irish Language 2010-2030", the government outlines a policy to increase the use and knowledge of Irish as a community language. This includes an aim to ensure that the use of Irish is a choice in public services and that Irish becomes more visible in society, both spoken and in areas of signage and literature. The Strategy written by the Department demonstrates its support for the development and preservation of the Irish

language by a long-term commitment to coherent and comprehensive approach to the future of the language as a living, spoken language with a firm position in the education system, at the highest levels of the political system and in public administration.

With this in mind, every effort is made within KNP UNESCO Biosphere to facilitate Irish speakers. At present, the Department employs a Conservation Ranger for KNP UNESCO Biosphere Reserve and two guides for Muckcross House and Gardens who can provide their services to the public through Irish. All information and signage is available in English and Irish and all interpretative material is bilingual. This will continue to be a priority for the Kerry UNESCO Biosphere Reserve Management Council.

2.3.9 Effectiveness of management/coordination

Significant improvements have resulted from effective management of the KNP UNESCO Biosphere Reserve. Management priorities have included but are not limited to the following management programmes:

- *Rhododendron* eradication programme
- Establishment and maintenance of a sustainable upland grazing regime
- Erosion control and trail maintenance
- Monitoring and management of water quality

These programmes are discussed fully in Section 4 (Conservation Function). They will remain management priorities of the proposed Kerry UNESCO Biosphere Reserve.

2.4 Matters of special interest with regard to the KNP UNESCO Biosphere Reserve

2.4.1 Local/regional/national plans that address the UNESCO Biosphere

The UNESCO Biosphere area is covered by national, regional, and local plans which are identified and discussed in further detail at Section 7 – Governance of this review. These plans set in place objectives, policies and guidelines which seek to protect, enhance and manage the unique and special natural, built and cultural heritage within the UNESCO Biosphere. A key theme which runs through the objectives at a local level is the significant relationship to be fostered between communities and their natural, cultural and built heritage. These objectives compliment the overall objectives of the UNESCO Biosphere Reserve programme.

2.4.2 Outcomes of management/cooperation plans of government agencies and other organizations

There have been internal reviews of the KNP management plan and from time to time of various management issues and programmes. However, it was noted that many of the actions that had been proposed in the KNP Management Plan had been implemented successfully or are ongoing. Whilst some of the dates set out in the KNP management plan have not been achieved, it is noted that much of the proposed works such as *Rhododendron* clearance has been ongoing and is making progress in KNP. In other areas, such as the management of deer/goats/sheep, resolution of the issues at hand has not been finalised but works between the NPWs and a variety of stakeholders are currently ongoing to facilitate this.

2.4.3 Continued involvement of local people

The NPWS liaise extensively with a wide range of user or interest groups in the course of the management of KNP UNESCO Biosphere Reserve. The KNP Liaison Committee ensure the views of local communities and interest groups are represented in relation to the UNESCO

Biosphere. Regular events are held for a wide range of groups including families, naturalists, historians, children and others. These are regularly advertised on the KNP website.

In the future with the Kerry UNESCO Biosphere Reserve, an increased level of public engagement, especially within the Buffer and Transition Zones, is now proposed with the establishment of a UNESCO Biosphere Advisory Comhairle. This will foster increased participation and coordination in the areas outside the Core Area of KNP. The Kerry UNESCO Biosphere Reserve will also involve other members of the local community through events, blogs, e-zines and as part of the management policy data gathering operations.

A key objective of the Kerry UNESCO Biosphere Reserve is “to establish and continue effective liaison with all parties with an interest in the management of these areas and to maintain a good relationship with the local community”.

2.4.4 Women’s roles in the UNESCO Biosphere

The Gender Equality Index assesses the impact of gender equality policies in the EU over time. It is built around EU policy priorities including work, money, knowledge, time, power, health, violence against women and intersecting inequalities. In 2015, Ireland placed ninth highest out of 27 EU member states, slightly ahead of the EU average.

According to a Central Statistics Office (CSO) report “Women and Men in Ireland 2013”, Irish women are more likely to have a third-level qualification than men and boys are more likely to leave school early. In employment, men work longer hours, have a higher rate of employment but also have a higher rate of unemployment. While those looking after the home and family, are overwhelmingly female. In 2011, women’s income was 94% of men’s when adjusted for longer hours worked by men.

Women tend to be under-represented in the highest decision-making structures at both national and regional levels, according to the report. In 2013, 15.7% of TDs (Irish members of parliament) were women and they accounted for less than a fifth of members of local authorities. The average female representation in national parliaments in the EU was 27.5% in 2013. The public sector in Ireland, which has traditionally been a key employer of women, has made strong efforts to promote equal opportunities and to address gender imbalance in decision making.

Equality is enshrined in the Irish Constitution. Ireland's social protection programme includes maternity leave, paternity leave and other family friendly leaves to support parents to reconcile work and family life. Childcare services have also been expanded to support the childcare needs of parents who are in employment, education or training. State and European Social Funding have been made available for positive action programmes to support gender equality.

Women actively participate in the KNP UNESCO Biosphere Reserve. NPWS, as an employer, prohibits discrimination in a wide range of employment-related areas including recruitment and promotion, equal pay, working conditions, training or experience, dismissal and harassment including sexual harassment.

In addition, women are hold seats on the KNP Liaison Committee and the roles of Chairperson and Secretary are held by women.

In the future, NPWS and Kerry County Council will be the primary stakeholders in the proposed Kerry UNESCO Biosphere Reserve and are equal opportunities employers. In addition, women hold positions on the Periodic Review Working Group as well as all stakeholder groups. Women are encouraged to apply for the role of Kerry UNESCO

Biosphere Reserve Officer and to participate in the proposed Biosphere Management Council, Advisory Comhairle and Scientific Advisory Committee.

2.4.5 Changes in the main protection regime of the Core Area(s) and of the Buffer Zone(s)

Yes, protection regimes within KNP UNESCO Biosphere Reserve has been strengthened by several national and international environmental designations which entail important legal responsibilities. The Core Area covers all or part of the following designated sites:

- Killarney National Park
- Killarney National Park SPA
- Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment SAC
- Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment pNHA
- Derrycunihy Wood Nature Reserve

The proposed Kerry UNESCO Biosphere reserve will also incorporate the Eirk Bog Nature reserve into the Core Area. These areas are subject to the following national and international designations:

- Eirk Bog Nature Reserve
- Eirk Bog SPA

There is currently no Buffer Area defined in the KNP UNESCO Biosphere Reserve. However, proposed Buffer Zones within the Kerry UNESCO Biosphere Reserve are subject to the following designations:

- Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment SAC
- Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment pNHA
- Castlemaine Harbour SAC
- Doo Loughs pNHA

These designations require monitoring and reporting within these areas.

2.4.6 Research and monitoring activities undertaken in the UNESCO Biosphere reserve

Please refer to Sections 6.1 and 6.2 for more information on the research and monitoring activities in the UNESCO Biosphere and to the Supporting Documents for a list of more than 150 studies that have been carried out in KNP in the past 10 years.

2.4.7 Strengthening of collective capacities for overall governance

With the expansion and the development of the Kerry UNESCO Biosphere Reserve, a management council that is specific to the UNESCO Biosphere reserve will be required. The Kerry UNESCO Biosphere Reserve will no longer be confined to KNP and will no longer be primarily in the ownership of the State. It will therefore require a dedicated and expanded regime for governance and liaison.

Whilst management within the National Park will remain as it is at present, a separate and dedicated Kerry UNESCO Biosphere Reserve Management Council will be formed with members from Kerry County Council and NPWS. This will reflect the wider area covered by the Kerry UNESCO Biosphere Reserve and the increased number of landowners (most of the Buffer Zone and Transition Zone is in private ownership).

The NPWS and Kerry County Council will be the principal governors of the Kerry UNESCO Biosphere Reserve but all relevant stakeholders will be represented on a separate UNESCO Biosphere Advisory Comhairle.

A separate Scientific Advisory Committee will also be established. This small committee will comprise standing representatives third level institution and from the Biosphere Management Council. It will be chaired by NPWS and may appoint other scientists on an ad-hoc basis as may be agreed. The committee will provide scientific advice in relation to the overall UNESCO Biosphere reserve, will work closely with the scientific structures for KNP and it will oversee a collaborative research direction for the wider UNESCO Biosphere reserve. In addition, it will administer the UNESCO Biosphere reserve scientific fund.

2.4.8 Additional information about the interaction between the three zones

The Core Area of the Kerry UNESCO Biosphere Reserve is under the management of a single landowner (the State) and is primarily managed for conservation of its outstanding natural and cultural heritage along with the function of providing education and research.

The proposed Buffer Zone that surrounds the Core Area is owned and managed for a variety of different purposes by many different landowners (mainly agriculture, tourism, fishing and forestry). However, all the lands within the Buffer Zone are of similar habitats to those that are within the Core Area and are already subject to protection as part of the Killarney National Park, MacGillycuddy Reeks and Caragh River SAC and thus only activities that are compatible with the conservation of the Core Area are permitted in this area. All lands and watercourses within the Buffer Area, with the exception of the northern part of the MacGillycuddy Reeks and a small part of the River Laune alluvial woodland connected to the Core Area, are within the Lough Leane Catchment and any waters arising on them must necessarily flow through the Core Area. In this way, the protection of water quality within the buffer protects water quality within the Core Area.

The proposed Transition Zone is located almost entirely within the Leane catchment also and thus has a connection with the Core Area in the same way that the Buffer Zone does. The land uses in this area are more intense and the habitats generally not protected under European Law or identified as being of particular importance for biodiversity. However, the proposed Transition Zone is under the same local authority governance as the Core Area of the reserve and much of the economic activity in the area is dependent on KNP and the protection thereof as a source of tourist income. Measures that encourage sustainable development and landuse in the area along with protection of the environment and in particular, watercourses are included within the various local and national policies and guidelines that govern the zone.

Thus, the connectivity of the zones is as follows:

- Hydrology: Lough Leane is located within the Core Area; the Buffer Area contains protected rivers & upland catchment and the Transition Area contains the whole catchment.
- Montane Habitats: The Core Area contains montane & upland habitats; Buffer Areas comprise protected upland areas with the same habitat range within the MacGillycuddy Reeks, Mangerton range, Crohane and the Paps; the Transition Area represents northern areas of the MacGillycuddy Reeks with recreational access and connected farmland.
- Woodland Habitats: The Core Area contains alluvial woodland at outflow of Lough Leane; the Buffer Area contains connected alluvial woodland & river downstream of outflow; While the Transition area encompasses the catchment of this Buffer Area.

A number of groups work together to actively promote sustainable development and to balance economic development within the buffer and Transition Zones. These include the MacGillycuddy Reeks Mountain Access Forum, which works to balance conservation and agriculture with the pressures of visitor access on private mountainous lands and the Lough Leane Catchment Group who work to protect water quality in the Leane catchment.

2.4.9 Participation of young people

The engagement of young people with the UNESCO Biosphere is highly valued at KNP which is evident in the amount of outreach activities geared towards different age groups of children and teenagers provided by the KNP Education Centre (for more detail see section 6.4). Courses and activities are run within the UNESCO Biosphere at the Education Centre as well as in schools and third-level institutions and often in conjunction with other initiatives or authorities such as the Heritage in Schools Scheme or the Sustainable Energy Authority of Ireland. An emphasis is made on creating awareness of the biodiversity within the park and how this can be conserved. Further involvement of young people is through their membership on youth branches of NGOs like the Irish Wildlife Trust or Birdwatch Ireland.

The needs of children visiting the UNESCO Biosphere are considered by providing children friendly activities and attractions such as boat tours, horse rides or Muckross Traditional Farms as well as the provision of playgrounds and short walking and cycling trails which can easily be managed by young visitors.

3 ECOSYSTEM SERVICES

3.1 Ecosystem services within the UNESCO Biosphere and beneficiaries

Each ecosystem within the natural environment offers a wide range of benefits to people, ranging from the provision of raw materials over climate and water regulation to cultural gains and recreational opportunities. These benefits are known as Ecosystem Services. The Millennium Ecosystem Assessment Framework defines an ecosystem classification based on ten global reporting categories (marine, coastal, inland water, forest, dryland, island, mountain, polar, cultivated, urban), of which the KNP UNESCO Biosphere contains three (table below).

Categories of ecosystems found in KNP UNESCO Biosphere Reserve based on the Millennium Ecosystem Assessment

Category	Central Concept	Boundary limits for mapping
Inland water	Permanent water bodies inland from the coastal zone, and areas whose ecology and use are dominated by the permanent, seasonal, or intermittent occurrence of flooded conditions	Rivers, lakes, floodplains, reservoirs, and wetlands; includes inland saline systems. Note that the Ramsar Convention considers "wetlands" to include both inland water and coastal categories.
Forest	Lands dominated by trees; often used for timber, fuelwood, and non-timber forest products	A canopy cover of at least 40 % by woody plants taller than 5 m. The existence of many other definitions is acknowledged, and other limits (such as crown cover greater than 10 %, as used by the Food and Agriculture Organization of the United Nations) will also be reported. Includes temporarily cut-over forests and plantations; excludes orchards and agroforests where the main products are food crops.
Mountain	Steep and high lands	As defined by Mountain Watch using criteria based on elevation alone, and at lower elevation, on a combination of elevation, slope, and local elevation range. Specifically, elevation >2,500 m, elevation 1,500–2,500 m and slope >2°, elevation 1,000–1,500 m and slope >5° or local elevation range (7 km radius) >300 m, elevation 300–1,000 m and local elevation range (7 km radius) >300 m, isolated inner basins and plateaus less than 25 km ² extent that are surrounded by mountains.

While no official Ecosystem Service Assessment (ESA) has been carried out at KNP to date, we provide an overview of possible Ecosystem Services based on the findings of the Management Plan for Killarney National Park 2005-2009 (table below).

Provisioning (a), regulating (b), cultural (c) and supporting (d) services within the UNESCO Biosphere

Service	Ecosystem	Examples	Beneficiaries
---------	-----------	----------	---------------

Service	Ecosystem	Examples	Beneficiaries
a) Provisioning Services			
Food and fibre	Inland water Forest, Mountain	Fishing (salmon & trout) Meat and/or wool from farmed animals grazing in the park	Anglers, Farmers, consumers
Genetic resources	Inland water Forest, Mountain	Arctic Char, Killarney Twaite Shad Special attention on maintaining the genetic integrity of Kerry Cattle, Kerry Red Deer and Japanese Sika Deer	Farmers, conservationists
b) Regulating Services			
Air quality	Forest	Removal of pollutants and provision of oxygen (trees)	Visitors and residents in the KNP area
Climate regulation	Forest, Mountain	Atmospheric carbon sequestration and storage (trees, peatland)	Everyone
Water regulation	Inland water	The lakes and river catchment regulate the water cycle and deliver water and sediments to floodplains	Farmers, anglers, residents within the area
	Forest, mountain	High water storage capacity of peatlands and certain soils in the area mitigates flash flooding	
Water purification	Inland water	Water can take up nitrates and phosphates, riverside vegetation traps farm pollutants	Farmers, anglers, residents within the area
	Forest, mountain	Forests and peatland aid in the filtration of water	
Protection from erosion, wind	Forest	Trees provide both protection from wind and from erosion	Visitors and residents in the KNP area
c) Cultural Services			
Recreation and tourism	Inland water	Boating, fishing, swimming	Visitors and residents in the KNP area
	Forest, Mountain	Walking, cycling/mountain biking, rock climbing (with permit), sights (e.g. Muckross House and Abbey, Ross Castle)	
Educational	n/a	KNP Education Centre, KNP visitor Centre, talks and lectures at Muckross House, Traditional Farms complex, National Park guides and Information Officers	Anyone interested in nature or the history of KNP
Inspirational	n/a	The landscapes in KNP have inspired countless painters and poets, and the park is featured in several documentaries	Artists, nature enthusiasts
Cultural heritage	n/a	Remains of prehistoric sites, demesne landscapes, boathouses, mines, quarries and lime kilns, old habitations	Anyone interested in the history of KNP

Service	Ecosystem	Examples	Beneficiaries
		and field systems, Kerry Cattle and other rare breeds	
d) Supporting Services			
Soil formation			
Nutrient cycling			
Primary production			



Greater Butterwort (credit: Kathryn Freeman)

3.2 Changes in indicators of ecosystem services

As there has been no ESA in the past, there are no changes to report. There are a range of indicators which are commonly used to quantify the benefits of different ecosystems which are summarised in *Wolff et al 2015* and *Ryan et al 2015*. A few examples of these indicators which could be used in future studies in the UNESCO Biosphere include:

Provisioning Services

Food and fibre:

- Number of fishing licenses
- Quantity of production and sale of meat & wool, quantity of production, collection and use of wild food

Regulating Services

Water / flood regulation:

- Vulnerability of assets (monetary potential flood damages and economic value of assets)
- Vulnerability of land use (population density, average consumption rates, water storage capacity in m³, reduction of flood danger, prevented damage to infrastructure)

Climate regulation (carbon sequestration):

- International carbon market pricing
- Marginal abatement cost
- Social cost

Cultural Services

Recreation and tourism:

- Accessibility (presence of roads, infrastructure)
- Distribution of recreational outdoor opportunities; proximity (travel distance, distance to residential areas)
- Use of recreational facilities (visitor numbers)
- Socio-economic characteristics (wealth, education, poverty rate, age, household living conditions)
- Presence of tourists (density of hotel rooms within 5km from forest, camp site density)

Cultural heritage, education:

- Willingness to contribute to the maintenance of service
- Willingness to pay



Harebells (credit: Kathryn Freeman)

3.3 Update on biodiversity involved in ecosystem service provision

As no ESA was carried out in KNP it is not fully known which species are involved in the provision of ecosystem services. Below is a list of species which occur in KNP and which are generally involved in the provision of ecosystem services but their contribution requires further study.

Forest/mountain ecosystems:

- Nutrient recycling & nitrogen mineralisation, soil quality & formation: earthworms, soil insects and fungi and soil microbes

- Water regulation: sphagnum moss, earthworms, soil microbes
- Biological pest control: insectivorous birds, spiders, carabids, hoverflies, ladybirds, parasitoid wasps

Inland water ecosystems:

- Water purification: water lice, larvae of blackfly and mayfly, snails, beetles and bottom feeding detritivores, zooplankton

3.4 Recent/updates ecosystem service assessment

No evidence of any ESA having been carried out for this UNESCO Biosphere reserve since designation. However, the NPWS have commissioned a short project for a National Ecosystem and Ecosystem Services mapping pilot:

***Parker et al 2016* - National Ecosystem and Ecosystem Service Mapping Pilot for suite of prioritised services. NPWS Irish Wildlife Manual**

This project highlights the importance and values of biodiversity and ecosystems and set out to initiate discussion on how ESAs can be integrated into multisectoral decision making processes in Ireland. Maps showing habitats as well as selected Ecosystem Services (carbon storage capacities of soil, vegetation and marine sediments, water retention and filtration, marine and terrestrial food provision) can be accessed at <http://dahg.maps.arcgis.com/apps/MapSeries/index.html?appid=cb5040a4a19645b6b424bed940c54fff>.

There is also one study by Teagasc (the Irish Agriculture and Food Development Authority) that has looked at the provision of Ecosystem Services of Irish forests in general which could be used as groundwork for an ESA on the woodlands in the UNESCO Biosphere:

***Ryan et al 2015* - ECOVALUE: Valuing the Ecosystem Services of Irish Forests. Teagasc report:**

This report investigates the value of Ecosystem Services delivered by Irish forests

- The volume of carbon sequestered by Irish forests in 2013 was 3,946.9 kt CO₂ yielding a value of €22.9 million.
- The annual value of forest biodiversity is estimated to be €68 million.
- The influence of forest cover on biological measures of water quality (i.e. Q-values) was shown to have had a negligible (although statistically significant) impact on changes to water quality.
- The value of recreation in Irish forests is estimated at €179 million.

Some studies (selection below) have been carried out to assess the habitats and species found in KNP which could also be used as groundwork for an ESA in the UNESCO Biosphere:

National Parks and Wildlife Service 2015 - Natura 2000 Standard Data Form (Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment SAC):

This report lists:

- Habitat types present and assessment
- Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them
- Other important species of flora and fauna
- General site character description, quality and importance
- Threats, pressures and activities with impacts on the site
- Site protection status

Kelly et al 2012, 2015 - Fish stock surveys for the Water Framework Directive Lakes at Lough Leane (2014), Killarney Upper lake (2011), South Western River Basin District (2010) Inland Fisheries Ireland reports:

These are experimental surveys using hydroacoustic, pelagic gillnetting and trawling for fish stock assessment and provide data on the species richness, abundance and life data (e.g. age and length) of the fish.

Environmental Protection Agency 2003 - Lough Leane Catchment Management and Monitoring System. Final report:

Collected and analysed > 10,000 samples to provide datasets to investigate nutrient sources, loads and variations within the catchment

Outcomes:

- Provision of monitoring and information systems to support water quality management decisions
- Provision of a framework to facilitate the implementation of relevant EU regulation
- Provision of an integrated catchment-based strategy, detailing management measures for reducing phosphorous inputs from all sources and environmental indicators against which to record progress
- Provision of a focus for the co-ordination of future environmental protection and implementation of the proposed management measures

In addition, several other datasets are available that will aid with the creation of an ESA for the UNESCO Biosphere (see *Parker et al. 2015*) e.g. www.epa.ie/soilandbiodiversity/soils/land/corine/



Common Blue (credit: Kathryn Freeman)

4 THE CONSERVATION FUNCTION

4.1 Significant changes in the main habitat types, ecosystems, species or varieties of traditional or economic importance

There have been few significant changes to the habitats at KNP since the designation of the park as a UNESCO Biosphere. For a list of main habitat types and associated Annex I habitats in the UNESCO Biosphere, see table below. Those changes that did occur are mainly concerned with the management and eradication of non-native species but also with the impacts of humans and grazing animals on the park.

Main habitat types and associated Annex I habitats for which the KNP is designated as a Special Area of Conservation

Main habitat type	Associated Annex I habitats
Blanket Bog	Blanket Bog
Heath	Northern Atlantic wet heaths with <i>Erica tetralix</i> European dry heaths <i>Juniperus communis</i> formations on heaths or calcareous grasslands
Grasslands	Calaminarian grasslands of the <i>Violetalia calaminariae</i> <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>)
Dry broadleaved woodland	Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles
Wet broadleaved woodland,	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>)
Mixed Woodland	/
Yew woodland	<i>Taxus baccata</i> woods of the British Isles
Conifer plantations	/
Lakes and ponds	Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i>
Rivers, streams, waterfalls	Water courses of plain to montane levels with <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation

One of the main changes is concerned with the continued eradication of *Rhododendron* from the woodlands of the park. This invasive shrub had been introduced to KNP in the early 19th century and has been spreading ever since in the woodlands, heath and bog areas of the UNESCO Biosphere. By 1990, nearly 900 ha of the 1,200 ha (75%) of native woodland were infested. Following years of clearance work by volunteers, contractors and NPWS staff, about 40% of the infested oak woodlands had been freed from *Rhododendron* in 2009, employing a variety of methods which will be discussed in section 4.2.

Woodlands have regenerated in parts of KNP where deer exclosures were in place (normally following *Rhododendron* removal), this has led to an improvement in vegetation cover in ground and shrub layers which were previously sparse or non-existent.

Scrubs of ash, birch and alder have also started to develop around woodland margins and other open areas on the Muckcross Peninsula due to reduced grazing pressure and the cover of ling heather on the western part of the peninsula has significantly improved due to the same reason.

Increasing foot traffic on the 'Kerry Way', a long-distance walking route which runs through KNP, and 'concentrated hillwalking' on Mangerton and the Torc Mountains has led to erosion and the localised damage of sensitive habitats such as bog and wet heath. Erosion has also been furthered by sheep which have been regularly trespassing on KNP lands and which, in combination with a large number of red deer, sika deer and feral goats have also contributed to overgrazing particularly in woodlands and on bogs such as Cores Bog, Looscaunagh Bog, Newfoundland Bog and Oak Island Bog.

Nutrient inputs which arise outside the park have caused (in particular) Lough Leane and its catchment area to be threatened by eutrophication. This has potential to impact on several species which require protection under the EU Habitats and Birds Directive.



Small Copper (credit: Kathryn Freeman)

4.2 Main conservation programmes conducted in the UNESCO Biosphere over the past 10 years

A major conservation management issue within the core area is the lack of Atlantic oak woodland regeneration due to the combined effects of over-browsing, mainly by deer, and invasion by the exotic *Rhododendron ponticum*.

***Rhododendron* Eradication Programme**

Since the establishment of the UNESCO Biosphere reserve, there has been extensive documentation of the *Rhododendron* problem and planning its control (Cross, 1981; Barron, 2000; Groundwork, 2006; Higgins, 2006, 2008; O'Toole, 2011, 2014; Cahalane, 2017).

The Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs through the NPWS carries out an annual targeted programme of works to manage the spread of the invasive species *Rhododendron ponticum* in Killarney National Park. The extent of the problem varies from area to area within the National Park and the programme and the control methods used are regularly reviewed and refined to respond to the dynamic and vigorous nature of the plant in order to mitigate its impact throughout the Park. While a wide range of control methods are considered for this purpose, those chosen are generally selected on the basis of optimum efficacy, having regard to the most effective use of available resources.

It was estimated that approximately 3,700 ha of the 10,289 ha park has had some *Rhododendron* establishment (Cahalane, 2017). In 2006, the extent of *Rhododendron* cover was summarised for 35 sectors of the Core Area, with a total net cover estimated at 509 ha (Higgins, 2006: 6 (Table 1)). By 2016, the 10-year clearance programme by the NPWS had cleared 325 ha of dense mature woodland infestation, and reduced the total net cover by 100 ha. In addition, several hundred hectares of moderate and scattered infestation in adjoining areas were also cleared in the same period. The result has been that the whole southern part of the Core Area has been cleared, and is now subject to ongoing periodical maintenance of regrowth (Figure 4.1). Also, the highly important alluvial woodland at Reen, on the shore of Lough Leane, has been cleared. Since 2011, the Department of Arts, Heritage and the Gaeltacht has invested more than €700,000 to tackle the *Rhododendron* infestation. The Department's management programme has made significant inroads into the problem and now approx. 2,000 of those hectares, involving some 40 different sites, are under effective control.

The work involved is difficult and resource intensive and is carried out by outside specialist companies, Department staff and by volunteer groups under staff direction and supervision. The Department is committed to continuing this important and challenging work into the future.

Over the 20-year period, *Rhododendron* management has changed to being more cost-effective and environmentally sustainable (by the use of much less and more targeted herbicide, see also <http://www.irishtimes.com/news/environment/the-30-years-war-the-fight-against-rhododendron-1.2317249>). As a result of practical trial work, foliar spraying has been almost completely replaced by stem-treatment with 10% glyphosate. Recent trials of the maintenance of already cleared areas have demonstrated that cutting seedlings close to the ground and then spot-treating with herbicide can be successful with just 1% glyphosate solution (Round Up Biactive formulation). However, non-herbicidal methods of careful cutting at the precise depth are used by trained staff wherever possible.

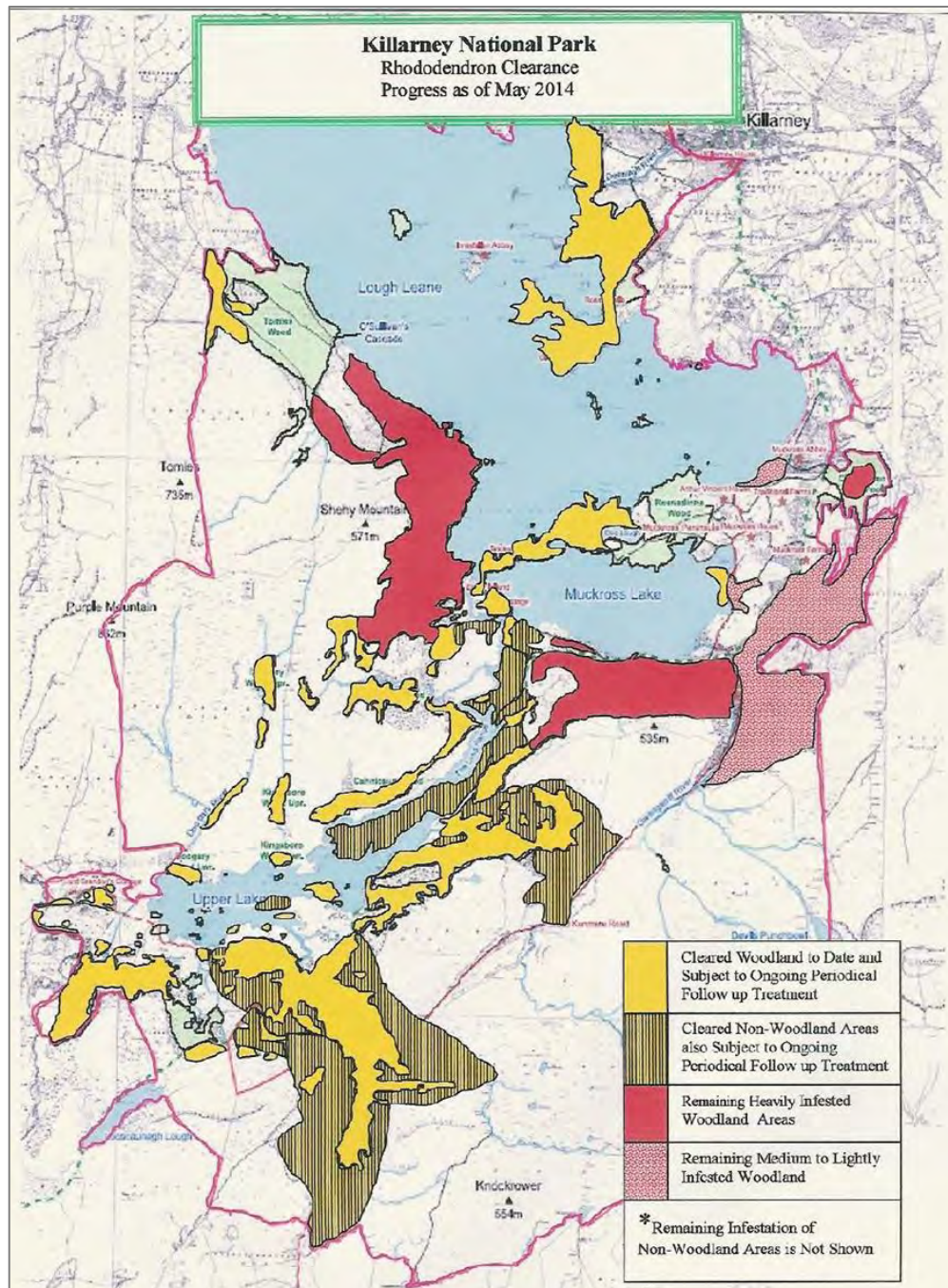


Figure 4.1. Map of Killarney National Park showing areas (woodland and non-forested) which have been cleared of *Rhododendron* and which are still infested (woodland areas only).

Over the last decade, clearance of mature *Rhododendron* by cutting, brash-piling and stem-treatment has been replaced by stem treatment without cutting, which has a number of cost, environmental and labour-saving advantages (O'Toole, 2014).

The following management has been undertaken to address woodland regeneration in the past 20 years:

- Clearance of mature *Rhododendron* from moderately- and heavily-infested areas;
- Maintenance of already cleared areas from re-establishment;
- Reduction in deer numbers by culling and fencing;
- Implementing a fire management plan.

The NPWS is updating its Management Strategy for KNP, and it will be finalised in 2017. There has been some disagreement between the National Park authority and two stakeholder NGOs concerning the effectiveness of the maintenance programme. According to the NGOs, there is monitoring evidence that *Rhododendron* will aggressively re-establish in some already cleared areas (Newman *et al.*, 2016: 29-35), and the technical issue is the extent of cover of re-established *Rhododendron* which is acceptable between maintenance years in terms of long-term woodland regeneration. It is therefore planned to address this by monitoring the effectiveness of maintenance, peer review of management practice, assessment of cost-effectiveness, and greater co-operation with stakeholders.

The National Park has an all year-round student volunteer programme for site maintenance and also runs 4 (two week) VSI work camps over the summer months in this regard as well. In addition, substantial areas are maintained and cleared under contract.

As *Rhododendron* management evolves in the next decade of the proposed Kerry UNESCO Biosphere Reserve, it is intended that the following strategy will be implemented:

- Continuation, and, where resources allow, increase in funding for cost-effective *Rhododendron* management in the core-area;
- Continuation of coordination of *Rhododendron* management by a dedicated member of Killarney National Park staff;
- Continuation of best-practice management of pesticide use and improvement according to IPM principles wherever feasible;
- Peer review of *Rhododendron* management in the core National Park area;
- Stakeholder consultation on Killarney National Park *Rhododendron* management;
- Continued facilitation of trained volunteer groups in cost-effective *Rhododendron* control within the core area;
- Increased scientific monitoring of the effectiveness of *Rhododendron* management, with adaptation of management plans based on monitoring;
- Investigation of the potential for *Rhododendron* control in buffer areas adjacent to the core area via targeted schemes.

Browsing management

The management goal is to establish and implement sustainable grazing regimes for the uplands. This will consider all ruminant grazing animals (e.g. sheep, red deer, sika deer, cattle and goats) as well as other impacts leading to erosion and habitat degradation such as burning, trampling and former peat cutting (which is now prohibited).

There are a number of practical issues involved:

- Killarney National Park (Kerry UNESCO Biosphere Reserve Core Area) is set in an otherwise extensively managed (Kerry UNESCO Biosphere Reserve Buffer Area) or more intensively managed (Kerry UNESCO Biosphere Reserve Transition Area) agricultural pastoral landscape. For this reason, the re-introduction of wolves is not feasible, as a natural method of reduction in browsing pressure by vertebrate herbivores. Culling is therefore practised, and has been successful in one peninsula of the Park, but otherwise it is not sufficient on its own, and probably not sustainable on its own, on conservation grounds due to the genetic conservation status of red deer in particular.

- The circumference of the Core Area is too large and inaccessible to cost-effectively construct and maintain a perimeter fence. However, fencing blocks within the Core Area, to allow woodland regeneration, has been successfully carried out up to recently in several areas of the National Park (Figures 4.2- 4.4).

The practices of culling and fencing will be continued, but reviewed in light of monitoring, cost-effectiveness and **feedback** from stakeholders.

Erosion Management

Board walks as well as stone and gravel paths have been put down in some areas (mainly on Torc Mountain and the Old Kenmare Road) experiencing heavy foot traffic to prevent further erosion and habitat destruction which have had a huge impact on minimising the effect of trampling and have allowed surrounding bog habitat to recover.

The MacGillycuddy Reeks Mountain Access Forum (see Part 1) has also contributed to erosion management on specific paths in the park which is proving to be successful. Further initiatives of the Forum include habitat restoration and trail repair, stakeholder engagement, fundraising, landowner training in trail repair and guiding, recreation use monitoring and trail condition monitoring.

Map 1. Exclosures (in yellow) within Ullanes Wood

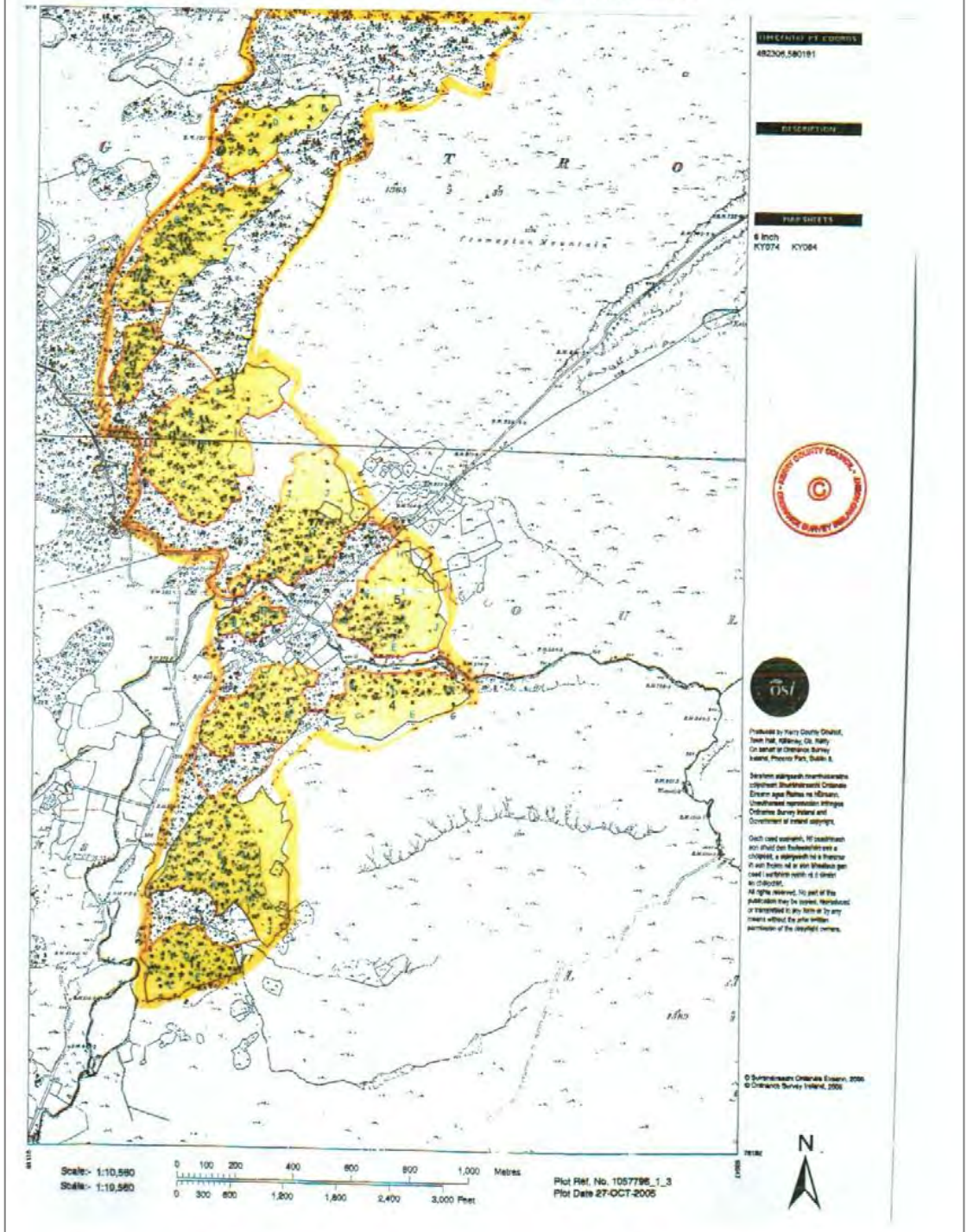


Figure 4.2: Locations of fencing blocks allowing woodland regeneration



Figure 4.3: A-frame fencing used in exclosures (credit: Frank McMahon)



Figure 4.4: A-frame fencing used in exclosures (credit: Frank McMahon)

Monitoring and management of water quality in lakes and rivers

The main aim is to prevent further pollution of the inland waters in KNP through constant monitoring of water quality on a regular basis (summer: weekly/fortnightly, depending on the waterbody being sampled; winter: monthly) by KCC. Monitoring of the effluent discharge from Muckross sewage treatment plant to Lough Leane is done on a similar basis. Further actions that have been taken:

- The Lough Leane Catchment Monitoring and Management System was a major catchment based initiative aimed at arresting the eutrophication process and restoring the rivers and lakes by reducing phosphorus inputs. More than 10,000 samples were collected and analysed from rivers, lakes and groundwater.
- Under the same system, river flows in the catchment were measured and water level recorders or staff gauges were installed on the majority of tributary streams with data being collected by dataloggers at a number of sites. Additional rain gauges were also installed at four sites to provide more detailed meteorological data.
- The problem of overgrazing to reduce siltation and erosion is being addressed.
- Inputs of soiled water and phosphates are being reduced by separating clean and soiled water.

The water quality is now generally good and there are no issues with public safety. Occasional transient algal blooms occur due to the simultaneous occurrence of specific weather factors in which case KCC erects warning signs along the affected shoreline stretches.

White-tailed Sea Eagle Reintroduction Programme

Formerly a widespread resident along all Irish coastlines, a programme to reintroduce the White-tailed Sea Eagle to KNP was undertaken by the NPWS and Golden Eagle Trust. White-tailed Eagle chicks were collected under licence in Norway and transported to Ireland for release. One hundred young birds were released between 2007 and 2011, at a cost of approx. €1.5 million.

These white-tailed Sea Eagles have dispersed throughout Ireland and beyond. Many eagles have been reported from Northern Ireland and at least six birds have travelled as far as Scotland. In 2016, ten pairs held territory in Ireland across four counties, including Kerry, Galway, Clare and Cork and nine pairs built nests and laid eggs. In total, fourteen Irish-bred White-tailed Eagle chicks have fledged between 2013 and 2016. Productivity is expected to increase with the increasing number of experienced adult breeders.

Illegal poisoning is the greatest threat to the eagle's recovery. Thirty-three eagle mortalities were recorded between 2007 and 2016, most because of poisoning.

Further conservation programmes that are ongoing (non-extensive list)

- Annual counts are being carried out to estimate deer populations and to understand the movements and interactions of upland and lowland deer.
- Waterfowl monitoring Since 1998, the relationship between changes in waterfowl use of Lough Leane and water quality has been investigated. This involves regular counts of waterfowl as well as invertebrate and plant sampling. Additionally, winter monitoring of the Greenland white-fronted geese which over-winter in KNP are carried out annually by direct observation and evidence-based methods as part of a national programme. The observed drop in geese numbers in KNP is most likely a reflection of their global population decline (resulting from climatic factors influencing breeding success and recruitment in their breeding grounds in Greenland and Iceland) rather than due to any local factors.
- General recording of fauna and flora

Regular censuses of animal and plant populations are an important and ongoing element in NPWS work, both at an internal and regional level and as part of national surveys. Therefore, datasets exist for an extensive range of species. Current or recent surveys/monitoring schemes include monitoring of Red Deer, Peregrine Falcons, White-tailed Eagles, Lesser Horseshoe and Daubenton's Bats, Butterflies, Freshwater Pearl Mussels, Pine Martens, waterfowl and woodland bird populations and as well as Juniper distribution, among many others. Datasets also exist for census work in the surrounding region: IWEBS (Irish Wetland Bird Survey), CBS (Countryside Bird Survey) and various seabird surveys. Results from these latter surveys are analysed by Birdwatch Ireland. Records made by conservation rangers as well as interested members of the public of notable species which have been observed throughout the UNESCO Biosphere are kept at the Ranger base. All relevant datasets are available to UNESCO upon request.

4.3 Integration of conservation, sustainable development and stewardship

The NPWS are working together with Kerry County Council (KCC) on issues such as water quality, control of dumping, and any other activities carried out by, or under the control of, local authorities, such as road maintenance and road closures. They are also liaising with KCC to advise on any development works proposed by either council that might have a negative impact on KNP. NPWS will continue to monitor applications for planning permissions and licences for lands adjacent to the UNESCO Biosphere and will seek planning permission, where necessary, for any proposed developments in the UNESCO Biosphere. All new proposals for the use of the UNESCO Biosphere will be evaluated in terms of their impact on the natural and cultural heritage. The Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs (DAHRRGA) recognises and welcomes the fact that KNP represents a critical input to the economic and social prosperity and development of Killarney town and the wider hinterland. At the same time, its primary and statutory remit is to conserve and protect the facility for present and future generations in accordance with the principle of sustainable development. Hence, NPWS will make every effort to facilitate the use of KNP for public use, if it complements the over-riding priority to promote conservation and education.

One of the primary changes since the establishment of the reserve as regards the conservation function is the designation of almost the entire area as part of the Natura 2000 network of designated sites. KNP was designated for conservation as part of the Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment SAC in 1997. It was also designated as the Killarney National Park SPA in 1995. Whilst this was not within the last 10 years, it has led to the strict protection of a range of habitats and species (and their supporting habitat) under the EU Habitats and Birds Directives respectively.

The SAC is designated for the protection of the following habitats that are listed on Annex I of the EU Habitats Directive:

- 3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)
- 3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea*
- 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation
- 4010 Northern Atlantic wet heaths with *Erica tetralix*
- 4030 European dry heaths
- 4060 Alpine and Boreal heaths
- 5130 *Juniperus communis* formations on heaths or calcareous grasslands
- 6130 Calaminarian grasslands of the *Violetalia calaminariae*
- 6410 *Molinia* meadows on calcareous, peaty or clayey -silt-laden soils (*Molinion caeruleae*)
- 7130 Blanket bogs (* if active bog)

- 7150 Depressions on peat substrates of the *Rhynchosporion*
- 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
- 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)*
- 91J0 *Taxus baccata* woods of the British Isles*

* denotes a priority habitat

The SAC is also designated for the protection of the following species that are protected on Annex II of the EU Habitats Directive:

- 1024 Kerry Slug (*Geomalacus maculosus*)
- 1029 Freshwater Pearl Mussel (*Margaritifera margaritifera*)
- 1065 Marsh Fritillary (*Euphydryas aurinia*)
- 1095 Sea Lamprey (*Petromyzon marinus*)
- 1096 Brook Lamprey (*Lampetra planeri*)
- 1099 River Lamprey (*Lampetra fluviatilis*)
- 1106 Salmon (*Salmo salar*)
- 1303 Lesser Horseshoe Bat (*Rhinolophus hipposideros*)
- 1355 Otter (*Lutra lutra*)
- 1421 Killarney Fern (*Trichomanes speciosum*)
- 1833 Slender Naiad (*Najas flexilis*)
- 5046 (Killarney Shad) (*Alosa fallax killarnensis*)



The Kerry Slug (Geomalacus maculosus) (credit: Chris Barron)

The Killarney National Park SPA is designated for the protection of the Following species:

- AO98 Merlin (*Falco columbanus*)
- A395 Greenland White Fronted Goose (*Anser albifrons flavirostris*)

Sustainable development issues in KNP are connected with large numbers of visitors to the UNESCO Biosphere and their associated activities. A few examples of how issues are managed:

Development of sustainable infrastructure

- Widening or straightening of existing public roads are subject to specific conditions designed to minimise disturbance to the UNESCO Biosphere.
- Further building of car parks, viewing points and picnic sites along the main roads traversing or adjoining KNP will be considered on their merits regarding the possible disturbance to vegetation, wildlife and demesne landscapes; the availability of sustainable alternatives, the obtrusiveness of the location and the likely level of use of the facility.

Control of activities that could impact on habitat integrity

- Currently, fishing is open to all anglers who wish to fish on the lakes, subject to national fishing regulations. However, due to the poor water quality and over-fishing in the lakes and wider catchments, some species of fish are under threat and the terms of new agreements in relation to fisheries management on the Laune and Flesk are under consideration.
- Numbers of boating permits are capped at levels that allow both commercial operators and private owners to use boats in the UNESCO Biosphere without compromising the conservation of flora and fauna of the lakes and surrounding areas.
- Rock climbing in KNP is subject to permission from the KNP authorities and will be granted only if no threat to habitats or species (e.g. breeding birds) is perceived.
- Cycling on designated walking tracks is prohibited on grounds of safety and to prevent erosion.

Waste management

- Waste generated through maintenance of the gardens and other landscaped areas is recycled by mulching shredding, and composting as appropriate.
- Methods of energy conservation in the management practices of KNP are examined and promoted.
- Waste reduction and the use of recyclable products in KNP management and in the provision of visitor services by the National Park or its licensees are examined and promoted.
- The use of products which are known to have a detrimental effect on the global environment is being avoided.

Management of demesne grasslands

- Certain areas of grassland are being managed extensively, with no fertilisation, to increase species diversity of plants and invertebrates while others are continued to be cut late in the season to provide winter-feed for livestock.

4.4 Assessment of effectiveness of strategies and actions

There have been internal reviews of the KNP management plan and from time to time of various management issues and programmes. Resources have been pledged to create a Biodiversity Plan for the Core Area that will outline conservation options and priorities and that will be used for future assessments.

4.5 Main factors influencing conservation efforts

The main factor that has been influencing the conservation efforts in the UNESCO Biosphere is the behaviour of the visitors within KNP, such as their recognition of the ecological value of this UNESCO Biosphere and their respect towards the habitats and animals in the park. Littering and trampling of vegetation as well as the disturbance of animals are factors which negatively influence conservation efforts. However, a survey

carried out by the KNP Education Centre showed that while litter blackspots exist within the UNESCO Biosphere, visitors rate the cleanliness within the park as very good. The KNP Education Centre in general is a major contributor towards increasing visitor awareness for the conservation issues KNP is facing (see Section 6.4).

Further factors include:

- Public volunteer participation has positively influenced conservation efforts by helping to eradicate the invasive *Rhododendron* (e.g. through the Adopt a Woodland Scheme (Section 4.2) or summer workcamps)
- The establishment of the MacGillycuddy Reeks Mountain Access Forum (see report Overview) in 2014 has positively influenced the protection and management of Ireland's highest mountain range
- The Kerry LIFE Project (kerrylife.ie) has been focusing on the restoration of the Freshwater Pearl Mussel population in KNP by developing and demonstrating sustainable land use management techniques and practices for forest-owners and local farmers
- Goodwill and cooperation between NPWS and landowners at an individual and organisational level are important contributors to tackling conservation issues
- Financial incentives have become an increasingly important source of alternative income particularly with regard to agriculture.

4.6 Other comments/observations from a UNESCO Biosphere reserve perspective

There are no other comments/observations.

5 THE DEVELOPMENT FUNCTION

5.1 Trends in the economic base of the UNESCO Biosphere

The most significant economic base of the UNESCO Biosphere is tourism. This is not only limited to the attractions and activities within KNP itself (e.g. Muckross House and Gardens, the Lakes of Killarney, Innisfallen Island, Killarney House and Knockreer House) but extends also to the hospitality services (e.g. B&Bs, hotels, restaurants, shops) within the towns adjacent to the UNESCO Biosphere, notably Killarney, Killorglin and Kenmare as well as tour operators travelling into the National Park. Since the economic downturn in 2008/2009 when visitor numbers to the Park dropped, a steady increase in tourists could be noted from 2010 onwards (as estimated from visitor numbers to Muckross House, see Figure 5.1 in Section 4.2.), bringing with them more income for local service providers. Several development projects have been going on within the UNESCO Biosphere over the past decade as well, mostly concerning renovations and further developments of historical buildings such as Killarney and Muckross House or Ross Castle. Additionally, facilities for visitors (e.g. walking paths, car parks, toilet blocks) are being extended with a focus on accommodating disabled or elderly visitors as well as children.



Muckross House (credit: Chris Barron)

5.2 Tourism in the UNESCO Biosphere

Visitors to the UNESCO Biosphere usually stay in Killarney town which is just outside KNP. Tourism is the main economic driver in Killarney, which has just recently been voted as Top 8 of global tourist destinations by Trivago (www.killarney.ie). Since 2010, there has been

substantial investment in the hotel sector (resulting in a 30% increase in the number of hotels and hotel rooms) and an increase in other accommodation (B&Bs and self-catering accommodation) in the town, bringing the number of beds available to about 12,000 (Kerry County Council, 2015).

In the last 5-10 years, there has been a noticeable increase in outdoor pursuits and marathons, triathlons or cycling events (Pat Dawson, pers. com.) such as 'Run the Ring of Kerry', 'The Kerry Way Ultra' or the 'The Ring of Kerry Cycle' and numerous operators such as Mor Active, Hidden Ireland Tours, Irish Adventures or Outdoors Ireland offer activities based in the UNESCO Biosphere such as hill walking or adventure sports. An increased interest in outdoor pursuits has obvious consequences for the environment such as erosion and trampling of vegetation and disturbance of wildlife, making the work of the MacGillycuddy Reeks Mountain Access Forum even more important.

In addition, visits to sites of historical/cultural interest such as Muckross House and Ross Castle are increasingly popular as is the appreciation of the scenery: In a survey of visitors to Killarney, 36% voted Muckross House & Gardens as their favourite attraction in the Killarney area, followed by the National Park (34%), Ross Castle (16%) and the general scenery (12%) (Flanagan et al. 2010). While the total number of visitors to the UNESCO Biosphere can only be estimated, concrete data is available from the Muckross House, Gardens and Traditional Farms complex, showing a steady increase in visitor numbers from 2010 until today, since the economic downturn in 2008/2009 (Figure. 5.1).

There are no studies examining the influence of the UNESCO Biosphere reserve designation on the number of tourists.

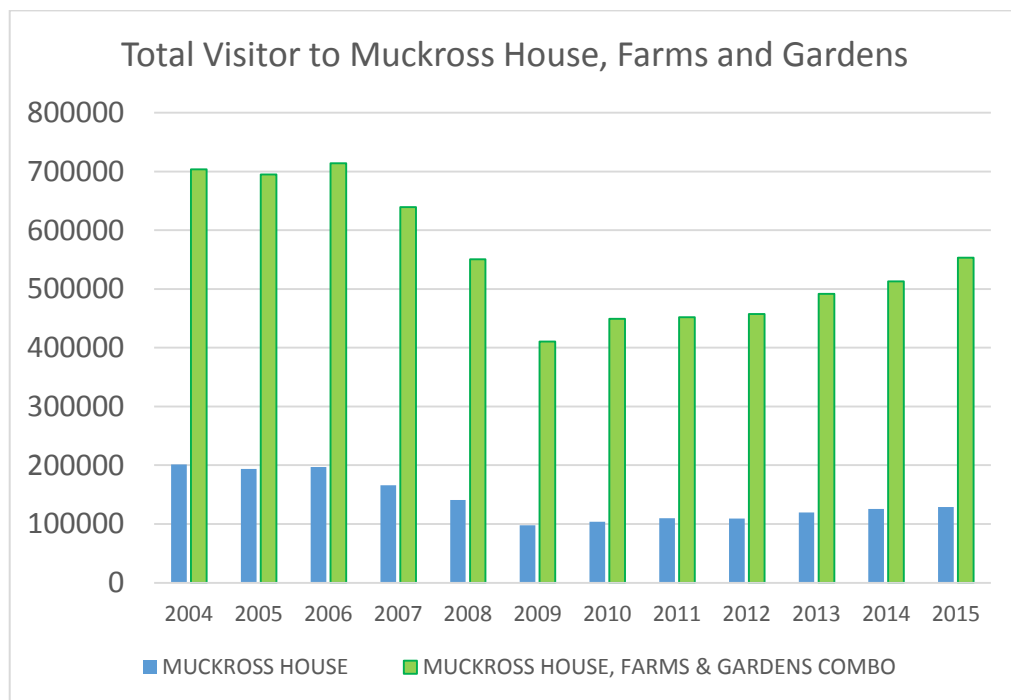


Figure 5.1. Visitor numbers to Muckross House, gardens and Traditional Farms between 2004 and 2015 (source: Pat Dawson)

Killarney House and Gardens Restoration Project

The newest, most important project in KNP UNESCO Biosphere Reserve is the Killarney House and Gardens Restoration Project, first announced by the DAHRRGA in 2011 for a budget of €10m (Fáilte Ireland have committed funding of €5.2 million under its Tourism Capital Investment Programme). The house is being developed as the main visitor and

interpretative centre for the National Park, highlighting the beauty and interpreting the richness and significance of the Park's landscapes, habitats, flora and fauna as well as telling the story of man's interaction with the Park over the centuries.

The location of Killarney House, within KNP UNESCO Biosphere Reserve, provides a quiet refuge from the busy streets of Killarney town. The availability of this focal point for the park within walking distance of the town strengthens the relationship between the UNESCO Biosphere and the town. A refurbished Killarney House in its historic and beautiful setting and functioning as a national park visitor center will provide an added attraction to visitors who wander around the town environs, especially in summer and provides an excellent opportunity to explain the significance and importance of the park, the UNESCO Biosphere as well as nature conservation in the region.

The visitor centre project contains three aspects. Firstly, a newly built extension will house an interpretative centre for the national park, explaining its significance and importance to the town and region, including information on the major themes of the national park; mountain, wood, water and the human impact on the environment. Secondly, as part of the new build element, the provision of exhibition space will be included to cater for temporary exhibitions, displays and cultural events. Thirdly, a number of reception rooms on the ground floor of the original house will be reinstated to accommodate original furniture currently in storage. The NPWS commits to including the designation of the UNESCO Biosphere reserve within its interpretation plan for the centre.

The former Pleasure Grounds and gardens immediately surrounding the house were also restored in 2014, creating spectacular landscaped areas that will merge into the natural areas of the park and which provide vistas linking the town to the scenery of mountain, wood and water.

This type of investment in the conservation of our natural and built heritage has the dual benefits of preserving the environment for the enjoyment of present and future generations while also improving the local and national economy through the generation and expansion of responsible sustainable tourism. This is clearly evidenced by Ireland's National Tourism Authority's (Fáilte Ireland) valuable collaboration on this project. Furthermore, Fáilte Ireland's significant contribution to the project's funding can be viewed as a clear statement of their confidence in the future of Killarney tourism.

This restoration project provides an opportunity to realise the ambitions of the NPWS, Fáilte Ireland and Killarney Town Council. It will bring Killarney House back to life as a major new iconic visitor attraction, incorporating a world-class visitor centre, which will generate additional sustainable tourism in the region. Beyond construction, the additional tourism footfall created by this project will greatly benefit the local economy and local job creation.



Killarney House (credit: irishexaminer.ie)

5.3 Other key sectors and uses of the UNESCO Biosphere

There are no other notable key sectors in the UNESCO Biosphere apart from tourism. While there is fishing activity on Lough Leane, this is not carried out on a commercial basis.

5.4 Economic benefits of the UNESCO Biosphere to local communities

Tourism is a major industry for the entire county of Kerry (more than 20 % of the entire workforce are dependent, in some form, on tourism) and offers the greatest growth potential throughout the county. In 2015, Kerry attracted more than 1 million overseas visitors plus more than 600,000 domestic holidaymakers who spent a total € 420 million (*Kerry County Council and Destination Kerry Tourism Forum 2016*) with Killarney being the main tourist destination within the county. With around 60 % of business owners in Killarney being from the town itself and a further 10 % being from Co Kerry, the majority of the money generated from tourism stays within the community (*Ryan, 2009*). In a 2010 survey of 436 Killarney town and valley residents, 95 % of residents are either agreeing or strongly agreeing that visitors make a positive contribution to the quality of life in Killarney. A clear majority of the residents also rated the impact of tourism on job creation and the local economy as very positive, while the impact of tourists on local business development, cultural facilities and community recreation (e.g. creation of pitches or cinemas) was rated mostly as positive (*Flanagan et al 2010*). Most residents also perceive that the appearance and presentation of public places improves due to tourism and that tourists contribute to an enhancement of leisure facilities. Nearly 50 % of residents agree or strongly agree that tourism also enhances the quality of the roads (*Flanagan et al 2010*).

The UNESCO Biosphere itself also creates employment in the areas of conservation management and education (e.g. associated with running the visitor and educational centre), service provision (e.g. boat hire or jaunting car tours) and hospitality (e.g. restaurants and cafes located inside the park).

5.5 Assessment of effectiveness of actions or strategies applied

No evidence of any formal assessment of the actions or strategies applied was recorded during the periodic review process. However, a fund is set up for the administration and promotion of the Kerry UNESCO Biosphere Reserve that will help to facilitate an evaluation of the development strategies applied in the UNESCO Biosphere.

5.6 Community economic development initiatives

Two of the objectives of the reserve are to:

- To encourage sustainable recreational and educational use, to provide information and facilities for visitors and to improve public awareness of its natural and cultural heritage.
- To establish and continue effective liaison with all parties with an interest in the management of these areas and to maintain a good relationship with the local community.

These objectives encourage recreational and educational use that is compatible with the tourism industry. The Kerry UNESCO Biosphere Reserve fully supports and encourages the tourism industry and encourages its development in the area in a sustainable manner.

In the future, the expanded Kerry UNESCO Biosphere Reserve will cover a far greater number of landowners in the buffer and Transition Zones than the KNP UNESCO Biosphere Reserve. The raising of the profile of the UNESCO Biosphere Reserve and its marketing as an area of global significance will create opportunities for marketing goods under the UNESCO Biosphere brand. This has the potential to result in economic opportunities within the local community.

5.7 Local business or other economic development initiatives

There is a big incentive from KCC to turn towards a more sustainable future for tourism which will require the natural heritage, built environment and cultural heritage to be nurtured and looked after in such a manner that they will continue to be available for future generations.

In the Kerry, Local Economic & Community Plan 2016-2021, the council mentions a number of other sustainable development objectives:

- support existing business in Kerry
- attract investment to Kerry
- sustainably maximise growth opportunities for Kerry
- sustainably diversify the Kerry economy
- develop marketing tools to promote Kerry as a destination to invest, work, live and visit
- increase access to education and skills for all members of the community while ensuring targeted skills development to match current and future skills demands
- sustainably develop the Information and Communication Technology infrastructure and smart town technology
- promote increased networking and collaboration across sectors to encourage shared ideas and resources helping to sustainably encourage innovation and economic development across the county and region
- maximise the economic potential and development of natural resources in a sustainable manner while ensuring no significant adverse effect on the environment
- expand the Green Economy by promoting sustainable renewable and efficient energy supply
- maximise connectivity of the county through investing in sustainable communication, services and transport infrastructure in appropriate locations
- develop social enterprise to strengthen the fabric of rural communities.

More details on each of the objectives and how it is envisaged to achieve them are available in the plan (page 47 – 86). While these objectives can be examined in isolation, they are also

interdependent with the aim of economic stimulation and growth and their common aim to promote Co Kerry as a place to work, live, invest and visit.

Residents, hoteliers and other businesses in Killarney have adopted a “phosphate free” attitude to washing powders and detergents, with beneficial effects on the water quality of Lough Leane in particular.

5.8 Changes in cultural values and heritage

As there are only few permanent residents within the UNESCO Biosphere, there have been no changes in cultural or other values since the designation of KNP as a UNESCO Biosphere in 1982.

5.9 Community support facilities and services

As there is no notable resident population within the existing UNESCO Biosphere, there are no community support facilities or services in place. In 2005, the Education Centre at KNP (in conjunction with Killarney Community College and Cappanlea Outdoor Education Centre) used to be involved in the ORBIT (Outdoor Resources Brought Into Teaching) programme, a three year informal training and educational course mixing formal schooling with outdoor sporting and environmental education to tackle early school leaving.

A range of facilities are available in Killarney town such as the Intreo Centre from the Department of Social Protection which offers employment services and support for jobseekers and employers, a Health Service Executive run health centre as well as mental health services.

5.10 Indicators for activities to foster sustainable development

No such indicators were identified during the periodic review process in relation sustainable development in and surrounding the Kerry UNESCO Biosphere Reserve. The plans and policies of KCC, set out the primary strategies and objectives to implement sustainable development in the region. It will be a task of the UNESCO Biosphere Management Council to review such plans and policies and to identify indicators of sustainable development within the Kerry UNESCO Biosphere Reserve. This will assist in evaluating the development function of the Kerry UNESCO Biosphere Reserve.

5.11 Main factors influencing the success of development efforts

The policies and management practices of NPWS, in consultation with the local stakeholders, are the principal positive influences. The formation of the KNP Liaison Committee in 2000 has contributed significantly to the on-going protection of the National Park’s resources (landscapes, habitats, flora, fauna, sense of tranquillity, etc.). One possible positive outcome of the Periodic Review process which is currently underway, would be the formation of a Kerry UNESCO Biosphere Reserve Forum, where all relevant stakeholders are represented and where the aims and objectives set for the UNESCO Biosphere can be promoted and delivered. The Biosphere Management Council has also pledged resources for a program for capital investment to enhance tourism and interpretation in the Core Area with a plan to extend this to other areas of the Kerry UNESCO Biosphere Reserve.

6 THE LOGISTIC FUNCTION

6.1 Main institutions conducting research or monitoring

Research and monitoring activities in KNP are mostly carried out by state bodies or Universities and Institutes of Technologies (ITs), generally located within the country but also from outside Ireland/ Europe, e.g. Spain (thesis from Julia Herreros Victoria, Valencia Polytec University, about the Wild Atlantic Way which includes a section on KNP), England (thesis from Noel Raymond, Manchester Metropolitan University, on the ecology and performance of Japanese Sika Deer and their impact on vegetation in KNP) (see Supporting Documents).

State bodies

These include:

NPWS of the Department of Arts Heritage, Regional, Rural and Gaeltacht Affairs

- Monitoring of species and habitats identified for conservation in the EU Habitats and Birds Directives

Environmental Protection Agency (EPA)

- Investigation into Integrated Catchment Management and the Irish Quality Rating System (Q-Scheme) for the assessment of water quality

Inland Fisheries Ireland (IFI)

- Monitoring of fish stocks for the Water Framework Directive



Sea Lampreys (credit: Paudie O'Leary)

Kerry County Council (KCC)

- Monitoring of water quality, species and habitats

Universities and ITs

These include:

University College Cork (UCC)

- **Geography**
Dr Eileen O'Rourke has recently published research on the reintroduction of the sea eagle to Killarney (*O'Rourke 2014*) / Kerry and high nature value mountain farming systems in Europe (including Kerry) (*O'Rourke et al 2016*) and has supervised two PhD students on upland biodiversity and farming systems in KNP (*Anderson 2013; Kramm 2010*) as well as an undergraduate dissertation on red deer habitats and dispersal behaviour carried out in KNP. She also brought a group of students on a field trip to Kerry which included a visit to KNP.
- **Biological, Earth and Environmental Sciences**
Prof John Quinn and his research group are currently carrying out a study on evolutionary ecology of cognition across a heterogeneous landscape with study organism great tit *Parus major*, installed over 400 nest-boxes in KNP.

A 9-hour field trip to KNP is part of the curriculum of the 3rd year undergraduate module BL3003 Conservation Biology led by Dr Padraig Whelan. Since the mid-1990s, students learn about the objectives of and zoning in National Parks, biodiversity conservation and participate in an exercise on the Recreation Opportunity Spectrum as used by the US Forest Service. Due to an increase in student numbers, this course is repeated over three days with a total of about 110 students from degrees such as Applied Plant Biology, Geography, Ecology, Zoology or Environmental Science as well as from ERASMUS and American exchange programs. There have also been four final year BSc projects on invasive or potentially invasive species carried out in KNP in 2012 and 2013 as well as PhD research (e.g. *Fuller 2013; Devaney et al 2015*).

Dr Fidelma Butler, coordinator of an MSc course in Ecological Assessment, has used KNP and Knockreer house to deliver an annual module on Habitat Classification since 2009. At least three MSc students completed dissertations within the UNESCO Biosphere Reserve.

Institute of Technology Tralee (ITT)

A detailed report on how ITT uses KNP can be found at 6.4.

University of Limerick (UL)

- **Biological Science**
Dr Ken Byrne is currently working on a project comparing soil properties in oak woods in Western European countries including samples from Derrycunihy woods in KNP. Professor John Breen (emeritus) visits KNP 1-2 times per year to monitor nests of wood ants *Formica lugubris* and he has recently written a Wildlife manual for NPWS on this species (*Breen 2014*).
- **Chemical Science**

Prof J. Tony Pembroke supervised a PhD student on the microbial ecology of autothermal thermophilic aerobic digestion carried out at the Killarney Wastewater Treatment Plant (*Piterina 2010*).

Galway Mayo Institute of Technology (GMIT)

- **Molecular Ecology Research Group**
Dr Elizabeth Gosling supervised a PhD student carrying out research about *Phytophthora ramorum* in Irish woodlands including forests in KNP (*O'Connor 2009*).

National University of Ireland Galway (NUIG)

- **Geography**
Dr Aaron Potito has worked on a few projects which incorporated sites in KNP, such as a tree ring study of the old growth Yew (*Galvin et al 2014*) or on lake surface sediments (*Potito et al 2014; Woodward et al 2012*). He has also supervised a PhD student carrying out research on the Impact of Volcanic Eruptions on the Climate and Ecology of Ireland (*Galvin 2010*) and around 20 undergraduate students from the Geography department have used KNP as a basis for their projects on topics such as tourism impacts and invasive species.
- **Botany and Plant Science**
Dr Micheline Sheehy-Skeffington (emeritus) and Prof Michael O'Connell (emeritus) have been bringing 3rd year undergraduate students to KNP to do relevés in the wet woodland on the lakeshore or in the yew wood. Dr Sheehy-Skeffington also supervised a PhD student carrying out research on the ecology of the oceanic montane vegetation of western Ireland and its potential response to climate change (*Hodd 2012*). Dr Hodd also conducted a habitat survey with suggested management options on Inisfallen in Lough Leane in 2007 commissioned by KNP.
Prof Michael O'Connell has led a botanical excursion of botanists (undergraduates, postgraduates, postdoctoral fellows and academic staff) from the Institut für Geobotanik, Universität Hannover Germany which stayed several days at KNP in 2003. He also supervised a PhD student carrying out research on palaeoecological investigations of lake sediments and peats which involved several visits to KNP (*Overland 2007*).

Trinity College Dublin (TCD)

- **Geography**
Regular student trips to KNP used to be part of the curriculum, however, trips abroad became more popular and cheaper. The TCD Geography Society visited KNP within the last month.
- **Mechanical and manufacturing Engineering**
Prof David Taylor supervised a PhD student carrying out research on lake sediment-based reconstructions of variations in levels of deposition of atmospheric pollutants from the industrial-scale combustion of fossil fuels and ecosystem response at three remote Irish lake sites including Upper Killarney Lough (*O'Dwyer 2009; O'Dwyer & Taylor 2009*).
- **Botany**
A 25-year study on oak regeneration in KNP was carried out by Dr Daniel Kelly (emeritus) (*Kelly 2002*), other studies include the influence of red-deer exclusion on yew- and oakwood carried out by Philip Perrin, Dr Daniel Kelly and Prof Fraser Mitchell (*Perrin et al 2011*).

University College Dublin (UCD)

- **Biology and Environmental Science**

Professor Bruce Osborne was funded by the Office of Public Works to carry out work on *Arbutus* and *Rhododendron* in KNP 20 years ago. Dr Ruth Carden and Dr Allan McDevitt have recently published research on the phylogenetics of Irish red deer (*Carden et al 2012; McDevitt et al 2009, 2012; McDevitt & Carden 2012*).

Dublin IT (DIT)

- **Hospitality Management and Tourism**

Dr Kevin Griffin and Dr Sheila Flanagan have published several reports and surveys on tourism in the Killarney area (*Griffin et al 2010, 2011; Flanagan et al 2010*). Dr Ziene Mottiar and Dr Bernadette Quinn have supervised a PhD student carrying out research on the factors underpinning tourism development in Killarney and Clifden (*Ryan 2009*).

6.2 Main research themes undertaken to address management

Supporting Documents provides a list of more than 150 studies that have been carried out in the UNESCO Biosphere in the last ten years or that contain data that has been gathered from KNP. They are very diverse, ranging from species descriptions over habitat management and phylogenetic studies to tourism and culture. The main themes of research related to UNESCO Biosphere management are:

Water quality and management

Studies include:

- Catchment management (*Ballinger et al 2016*, EPA report including a case study on Lough Leane)
- Fish stock surveys of Lough Caragh, Upper Lake Killarney and Lough Leane (*Kelly et al 2012, 2015*, reports for Inland Fisheries Ireland)
- Pollution monitoring at Upper Lake Killarney (*O'Dwyer 2009*, EPA-funded dissertation from TCD)
- Waste water treatment in Killarney (*Piterina 2010*, dissertation from UL)



Pine Marten Kit (credit: Kathryn Freeman)

Plant and animal surveys

Studies include:

- Invertebrates (e.g. *Alexander & Anderson 2012*, NPWS funded survey on saproxylic beetles; *Arroyo et al 2013* mite survey in KNP; *Breen 2014*, NPWS funded study on the Hairy Wood Ant; *Fuller, 2013*, Department of Agriculture, Food and the Marine funded dissertation from UCC on invertebrate diversity in forests; *McDonnell & Gormally 2011*, NPWS funded survey on the Kerry Slug; *Walsh et al 2010*, report on migrant and notable butterflies in Ireland)
- Plants (e.g. *Connor 2013*, Article 17 assessment form for the Slender Naiad; *Holyoak 2008*, NPWS funded report on bryophytes and metallophyte vegetation; *Pentecost & Richardson 2011*, study on niche separation of lichens in Killarney oak woodlands; *Sales et al 2016*, study on factors influencing epiphytic moss and lichen distribution within KNP)
- Mammals (e.g. *Haigh et al 2015*, study on red squirrels in yew forests; *Lynch & McCann 2007*, study on the diet of pine marten in KNP; *McDevitt et al 2012*, study on landscape genetics of red deer in KNP; *Raymond 2008*, study on the ecology and performance of Japanese Sika Deer and their impact on vegetation in KNP)
- Fish (e.g. *Coscia et al 2013*, study on the genetic status and colonization history of the critically endangered Killarney shad; *Power & Neylon 2007*, study on the diet of Arctic char and brown trout in Lough Muckcross)
- Birds (e.g. *Graham et al 2014*, study on bird diversity in planted and semi-natural oak forests; *O'Rourke 2014*, study on the reintroduction of the white-tailed sea eagle to Ireland)

Forestry management

Studies include:

- Influence of deer exclusion on forest regeneration in yew and oak woodlands in KNP (*Perrin et al 2011*, NPWS funded)
- Management of *Rhododendron* in woodland (e.g. *Barron 2009*; *Harris et al 2009*)
- Spider diversity in oak and yew woodlands in response to grazing (*Fuller et al 2014*)



Lesser Horseshoe Bats (credit: Kathryn Freeman)

Farming and grazing management

Studies include:

- Biodiversity change in response to grazing in the Kerry uplands (*Anderson 2013*, Science Foundation Ireland (SFI) funded)
- Farming in the Kerry uplands (*Kramm et al 2010*, SFI funded; *O'Rourke et al 2016*)

6.3 Collection and dissemination of traditional and local knowledge

Most information of traditional and local knowledge is collected verbally and is disseminated verbally by the staff of the Education Centre through lectures, guided walks and workshops. A certain amount of information is also obtained more scientifically through work with students from third level institutions for their 4th year projects. This information is analysed by the students and disseminated through reports as well as poster presentations and talks. Not all of this information would necessarily be directly applicable to management practices, but copies of all project work are submitted to the Park Management. All relevant information from a training or educational point of view is incorporated into workshops or information given during lectures and guided walks.

Research (e.g. PhD theses, peer-reviewed publications or research reports) from state bodies or third level institutions that has been carried out in the UNESCO Biosphere is usually available through public repositories or from the websites of the state bodies and especially research funded by the NPWS or the EPA will directly inform management

practices and might subsequently also be incorporated in the training and educational programmes.

The National Biodiversity Data Centre (NBDC) organises an annual BioBlitz (<https://bioblitz.ie>) engaging the public to record as many species as possible within 24 hours. KNP has been frequently taking part and has won the 2011 event with a total of 1088 species recorded within 24 hours. These records are validated and added to the NBDC biodiversity maps which are available to be viewed by the public on their website (<http://maps.biodiversityireland.ie>).

6.4 Environmental/sustainability education

Programmes

The KNP Education Centre runs environmental/ecologically based courses for all age groups and abilities. The main educational institutions which are dealt with are Primary and Secondary Schools, Colleges, Universities and Institutes of Technology. All courses help to create environmental awareness, foster an appreciation of the outdoors and an awareness of the biodiversity which occurs in the National Park and how this can be conserved.

As well as all the courses, which are run within the National Park, the Education Centre conducts workshops and courses in schools and lectures regularly in ITT and on other recreation and tourism courses, mostly focusing on nature conservation. KNP also has its own hostel, Arthur Vincent House, which is managed by the Education Centre and which is used for groups (e.g. from universities, scouts, schools...) that take part in activities organised by the centre.

The KNP has recently been awarded two green flags under the An Taisce Eco Centre Programme (<https://greenschoolsireland.org>), One of these was awarded for their 'Litter & Waste' campaign (<http://www.killarneynationalpark.ie/education-centre/eco-centre/eco-litter-waste>), the other one for their 'Biodiversity' campaign (<http://www.killarneynationalpark.ie/education-centre/eco-centre/biodiversity>).

The CAPPANALEA Outdoor Education & Training Centre (<http://www.cappanalea.ie>) which is run under the auspices of Kerry Education and Training Board also uses KNP for a range of adventure sports (e.g. kayaking, orienteering) and field study activities tailored towards different age classes.

Primary Schools

The Primary School Nature Day is the main programme that is delivered to Primary school children. This incorporates bug hunts, pond dipping, mammal trapping and scavenger hunts. The children collect insects using sweep nets and pooters and bring them into the lab to examine them using the microscopes provided. They use nets to collect aquatic invertebrates in the river Deenagh and it is subsequently discussed how pollution affects the types of species found in the river. The mammals (normally wood mice and bank voles) are caught using Longworth mammal traps. The children examine these predator prey relationships and the different adaptations that the two species have for the niche that they occur in are discussed. Throughout the day the importance of conservation of our species and the concept of biodiversity is related to in all of the activities that they take part in.



Primary school education programmes (credit: Chris Barron)

Secondary Schools

The programmes for second level focus on the curriculum requirements for the biology and geography syllabi in both Leaving Certificate and Junior Certificate cycle. For biology, a woodland habitat is studied. The students use quadrats, lux meters, transects, hygrometers and other scientific equipment to collect data on the vegetation and abiotic factors that affect them within the woodland. For geography fieldwork, the students study the Owengarriff river looking at the velocity of the river, the depth, width, the size of the bedload and specific features of a river system. During the fieldwork for both geography and biology the importance of conservation of species and habitats is discussed and highlighted. Other courses that are being offered are the Transition Year course which includes a habitat study and ecological orienteering as well as a Junior Certificate Glaciation study where students take a boat trip of Killarney's lakes and traverse the Gap of Dunloe by foot.

Third level institutions

Many third level institutions have been coming to KNP for field trips and are carrying out research in the UNESCO Biosphere (for details see 6.1.2.), notably ITT (below). The results of their studies are usually available through public repositories and have been published as PhD theses, peer-reviewed publications or research reports for state bodies such as NPWS or EPA. Feedback about the rangers and education officers in the park was always extremely positive:

"Both I and my students have done quite a bit of research around Killarney and on the Iveragh Peninsula over the years and Killarney National Park and especially the Rangers (Tim Burkett, Peter O'Toole, Pascal Dower etc.) have always been very helpful, informative and an important resource for us. Some years ago, I had two PhD students working on upland biodiversity and farming systems, the park was a stakeholder on this project and always facilitated our work. One of my students, an ecologist, stayed in accommodation provided by the Park for a few months while doing fieldwork. All that was a big help. I have also done research on the re-

introduction of the sea-eagle to Killarney/Kerry, again Killarney National Park and its Rangers collaborated fully with me. Just recently the Ranger Peter O'Toole helped an undergraduate dissertation student of mine in relation to Red Deer habitats and dispersal behaviour. He spent a morning in the field with the student, which was really valuable and subsequently gave him feed-back on his research findings. I once took a group of around 35 students on a week-long field trip to Kerry, and the park's Educational Officer meet with us one morning and gave us a very good introduction to the park, its ecology and conservation. Overall, I believe Killarney National Park is a very valuable educational and research support structure, despite the serious current understaffing in the Park." Dr Eileen O'Rourke, lecturer in Geography at UCC

The Institute of Technology, Tralee (which presently has a resident UNESCO chair), uses KNP for educational and research purposes on a weekly basis during each academic year and has been doing so since 2007 in close collaboration with the NPWS and KNP Education Centre.

At undergraduate level, ITT uses KNP for approximately 15-20 fieldtrips per year, most notably in the delivery of a BSc (Hons) in Wildlife Biology and its two associated streams: 'Wildlife Biology' and 'Field Biology with Wildlife Tourism'. These programmes are designed to prepare graduates for employment in areas of ecological consultancy, environmental education, biodiversity conservation and eco-tourism. Modules on these programmes that utilise the park include Earth Science and Field Biology, Botany, Ecology, Habitat Studies, Wildlife Tour Leading, Land Use Management and Biodiversity Conservation. The variety of ecosystems and habitats available in KNP and their associated management issues make it an ideal location for field-based teaching and learning in the area of Wildlife Biology.

A key element of the Wildlife Biology programmes at ITT is the research projects that students undertake in Year 3 Ecology modules and in Year 4 'capstone' Research Project modules. Killarney National Park provides excellent opportunities for research projects at all levels and scales and the variety of habitat types available make it a valuable asset to ITT in the provision of such research opportunities. Students have completed an estimated 30 final year research projects in the park (National Framework of Qualifications (NFQ) Level 8) to date. ITT also has one Masters by Research (NFQ Level 9) project currently underway in KNP examining the ecology of oak woodlands, jointly supervised by Trinity College Dublin.

ITT Wildlife students complete a Work Placement module in Year 3 and in most years KNP hosts a number of students. Students are placed in Killarney National Park Education Centre where they assist with the delivery of a variety of education programmes. Students on placement spend some time working with the Conservation Ranger team during their placement.

"All our education and research activities undertaken in the KNP are carried out in accordance with best practice and fully in compliance with any requirements stipulated by the management of the park to ensure minimal impact. This ensures that our students acquire an appreciation of how one works in a protected environment in a professional manner.

The availability of KNP is vital to the educational services that ITT provides. The Institute engages with the park directly, in providing a location for field trips and research opportunities, and additionally in the procurement of the services of KNP. The UNESCO Biosphere Reserve status of KNP recognises its value in supporting education and research opportunities in the Southwest of Ireland. Adequate future resourcing of KNP and its Education Centre would continue to facilitate and enhance these opportunities into the future.

The EU and national policies of operating and maintaining nature reserves such as the KNP and facilitating their use by education and research providers is very positive and is important in the

management of our natural heritage. This comes at a cost to the public purse but it could perhaps be argued that their impact could be further enhanced if there was better resourcing to support education providers such as ITT, as currently the Institute incurs significant costs to be in a position to run its education and research activities from its own resources. It would be much more attractive if the KNP was resourced to a level that it could support the delivery of some of the education and research services itself. This would greatly enhance the impact that the KNP has in the region and in disseminating the excellent conservation and management work that it is doing.” Kilian Kelly, ITT

The KNP Education Centre is also providing guided walks and aid with fieldwork for international universities, this year De Paul University from Illinois, US and Aberystwyth University from the UK have been visiting the park already.

General public

The Education Centre facilitates informal environmental education to the general public through the provision of guided walks, Family Fun Days, lectures and summer camps for children. Some examples:

- **SpringWatch Nature Club**
Marking the changes in nature moving from winter into spring. Activities include campfire-cooking, bushcraft, den-building and bug-hunting.
- **Environmental Camps at Easter, Halloween and during the summer**
Aimed at 7-12 year olds, each camp is four days long and runs from 9.30 in the morning to 3.00 in the afternoon each day. The children will use mammal traps, pooters, nets and other equipment and explore the ecology of the park through many games and fun activities such as scavenger hunts, pond-dipping and planting trees. They also get to make a number of things to bring home such as bird nesting boxes, bat roosting boxes, wormeries and bug houses.
- **Discovery Weekend**
Aimed at 8-14 year olds, who will stay in the KNP hostel for the weekend and will participate in fully guided nature activities throughout their stay, such as live capture and release of small mammals, scavenger hunts, food chain games, quizzes, pond dipping, moth trapping, use of microscopes, bat walks, bat detection, etc.
- **Annual Spring School**
This is a series of lectures or illustrated talks, guided walks, boat trips and a Spring School Dinner. The talks are usually based on topics relating to a species, a habitat or a part of the landscape which exists in the National Park or in the Kingdom of Kerry.

Changes

The Education Centre is always looking at new opportunities and trying new initiatives. They recently established a native black bee apiary in Muckcross which is used with young people on their Junior Ranger Camps. A member of the Beaufort Beekeepers Association tends the bees and leads the demonstrations. Bee suits and other beekeeping equipment were purchased using funding supplied by Astella's, a local pharmaceutical company. The apiary has three traditional CDB hives which are used at workshops to demonstrate the need for conservation of the native black honey bee (*Apis mellifera mellifera*) and the importance of pollinating insects as well as how to keep bees.

They also started working with the Heritage in Schools Scheme (<http://www.heritageinschools.ie>), the Discover Primary Science and Maths Programme (http://www.primaryscience.ie/discover_centre.php?id=7), the Coillte Compass Club (<http://www.compassclub.ie>, discontinued since 2017) and the Sustainable Energy Authority of Ireland (http://www.seai.ie/Schools/School_Workshops) and are currently at the planning stages of facilitating the GLOBE (www.globe.gov) annual conference, which is a young scientists exhibition with fieldwork.

6.5 Assessment of the effectiveness of actions and strategies

All educational programmes and courses are periodically reviewed. During the course of the periodic review, no evidence of other formal assessment of effectiveness was identified.

6.5.1 The UNESCO Biosphere reserve's main internal and external communication mechanisms/systems

The KNP UNESCO Biosphere Reserves main internal communication systems include regular staff meetings and liaison with various relevant stakeholders including neighbouring landowners, those groups that are represented on the National Park Liaison Committee and the Local Authority (Kerry County Council).

In terms of external communications, KNP has an established and respected Education Centre, which delivers educational courses to a diverse range of recipients. In addition, KNP has a visitor interpretation facility that is soon to be opened in Killarney House but has been ongoing for many years in Muckross House. KNP has a long history of working with the local and national newspapers as well as through the media of TV and Radio. The NPWS also produce promotional and information leaflets about KNP

6.5.2 UNESCO Biosphere reserve website

There is currently no Kerry UNESCO Biosphere Reserve website, though this is among the first things to be set up with the adoption of the expanded Kerry UNESCO Biosphere Reserve. KNP has a website and this is the area of the existing UNESCO Biosphere Reserve.

<http://www.killarneynationalpark.ie>

6.5.3 Electronic newsletter

There is currently no electronic newsletter but as with the Kerry UNESCO Biosphere Website, this will be among the first things to be set up following the adoption of the expanded Kerry Biosphere Reserve.

6.5.4 UNESCO Biosphere reserve social networks

There is currently no BR information on social media but as with the Kerry UNESCO Biosphere Website, this will be among the first things to be set up following the adoption of the expanded Kerry Biosphere Reserve.

KNP is active on Social Media and this covers the area of the existing UNESCO Biosphere Reserve.

<https://www.facebook.com/KNPEC/>

<https://twitter.com/KNPEduCentre>

6.5.5 Other internal communication systems

No other significant internal communication systems were noted during the periodic review process.

6.6 Contribution of the UNESCO Biosphere to the word network of UNESCO Biosphere reserves

6.6.1 Collaboration with existing UNESCO Biosphere reserves at national, regional, and international levels, also within regional and bilateral agreements.

At the national level:

There is only one other UNESCO Biosphere Reserve in Ireland. This is the Dublin Bay UNESCO Biosphere, which is a coastal site with few ecological similarities with the Killarney UNESCO Biosphere Reserve. There have been few cooperative activities between the two reserves. Some examples of collaboration that has taken place are provided below:

- Provision of advice and comments relating to this periodic review process.
- Representation from KNP BR at events held by Dublin Bay BR

It is also worth noting that the NPWS are key members of the governance of both Biosphere Reserves. As such there is the potential internal collaboration and networking within the organisation in relation to the two BRs.

Despite the differences in ecology between the two reserves, there are good opportunities for collaboration into the future with potential 'UNESCO Biosphere' promotion and publicity.

Both the Kerry and Dublin UNESCO Biosphere Reserves propose to hold annual conferences. This is an ideal opportunity for those involved in the reserves to meet and to share common issues and information and to provide advice, support and guidance to one another.

At the regional level:

During the preparation of this periodic review, no evidence of cooperation with other UNESCO Biosphere reviews within the Atlantic Region was recorded.

Through twinning and/or transboundary UNESCO Biosphere reserves and within the world network:

During the preparation of this periodic review, evidence was found of collaboration between KNP UNESCO Biosphere Reserve and Waterton Lakes National Park UNESCO Biosphere Reserve in Canada. To commemorate Earth Day in 2005, four stamps were issued, two from each country, depicting both biosphere reserves (Figure 6.1).



Figure 6.1: Biosphere commemorative stamps (Canadian) (www.delcampe.net)

6.6.2 Current and expected benefits of international cooperation for the UNESCO Biosphere reserve

It is hoped that the proposed expansion of the reserve and its promotion as the Kerry UNESCO Biosphere Reserve with a dedicated management council and officer, will create

opportunities for far higher levels of cooperation with other reserves both on a scientific level and with regard to sustainable development.

There is good potential for twinning on a promotional and marketing level but there is also potential for additional scientific/conservation collaboration and networking. This will be the subject of further exploration with the Kerry UNESCO Biosphere Reserve and resources will be made available for this purpose

6.6.3 Contribution to the World Network of UNESCO Biosphere Reserves in the future and to the Regional and Thematic Network

The management of the Kerry UNESCO Biosphere Reserve will continue to protect and conserve the unique and protected biodiversity and habitats of the site along with the promotion of sustainable development, environmental education and scientific research. The newly proposed format for governance is designed to promote and market the reserve and involve the employment of a dedicated UNESCO Biosphere Officer. The Kerry UNESCO Biosphere Reserve will not only conserve the representative natural heritage of the Atlantic Region, but will also serve to provide additional information through increased scientific research and to publicise and highlight its importance on a global scale.

6.7 Main factors influencing the logistic support function

The main positive factor that influences the logistic support function is the ongoing cooperation between NPWS, KNP Education Centre and third-level institutions, ensuring a large amount of research outputs. The dedication of the educational staff as well as of the rangers in KNP (as can be seen from the testimonies by Eileen O'Rourke and Killian Kelly; see Section 6.4) also plays a major role in ensuring that conservation and development issues as well as research and monitoring projects within the UNESCO Biosphere are addressed. For improvement of this function in the future, resources have been pledged by the Biosphere Management Council for a number of initiatives including a scientific fund to assist studies within the UNESCO Biosphere, pursuing an EU LIFE project and establishing the UNESCO Biosphere reserve as a "Biodiversity Reference Site" an undertaking an all-taxa biodiversity inventory of the Kerry UNESCO Biosphere Reserve.

6.8 Other Comments

No other comments were considered relevant in relation to this section.

7 GOVERNANCE UNESCO BIOSPHERE RESERVE MANAGEMENT AND COORDINATION

7.1 Technical and logistical resources for the coordination of the UNESCO Biosphere reserve

To date, the National Parks and Wildlife Service have been the primary governing body for the UNESCO Biosphere reserve. This body is responsible for the management of Killarney National Park and currently employs approximately 50 staff for the purposes of conservation management, maintenance, agricultural management of habitats and land areas, public education, recreation and tourism management within the existing Killarney National Park UNESCO Biosphere Reserve. In addition to the dedicated full time staff employed for the management of Killarney National Park, various programmes and projects are carried out on contract

A National Park Liaison Committee was also set up in 2000. This group meets on a monthly basis with representatives from the National Parks and Wildlife Service. This liaison committee includes representatives from a wide range of stakeholders and discusses matters relating to the National Park (UNESCO Biosphere Reserve) in relation to a comprehensive and wide ranging interest groups. These include among others, anglers, hill walkers, environmental groups such as An Taisce and public access groups.

In addition to those primary and technical resources for the coordination of the Killarney National Park UNESCO Biosphere Reserve that are described above, The National Parks and Wildlife Service work closely with other bodies outside the land ownership of the National Park. In particular, Kerry County Council and its elected representatives, Killarney Chamber of Commerce and Fáilte Ireland (Irish Tourist Board) all of whom are stakeholders in the promotion and marketing of Killarney National Park.

With the expansion and the development of the Kerry UNESCO Biosphere Reserve, a management council that is specific to the UNESCO Biosphere reserve will be required. The Kerry UNESCO Biosphere Reserve will no longer be confined to Killarney National Park and will no longer be primarily in the ownership of the state. It will therefore require a dedicated and expanded regime for governance and liaison.

Whilst management within the National Park will remain as it is at present, a separate and dedicated Kerry UNESCO Biosphere Reserve Management Council will be formed with members from KCC and NPWS. This will reflect the wider area covered by the Kerry UNESCO Biosphere Reserve and the increased number of landowners (most the Buffer Zone and Transition Zone is in private ownership).

The National Parks and Wildlife Service and Kerry County Council will be the principal governors of the Kerry UNESCO Biosphere Reserve but all relevant stakeholders will be represented on a separate UNESCO Biosphere Advisory Comhairle. A number of specific forums are already in place within the Kerry UNESCO Biosphere Reserve Buffer and Transition Zones. In particular, there are the MacGillycuddy Reeks Access Forum, South Kerry Development Partnership, Killarney Chamber of Commerce and the Lough Leane Catchment Working Group. These forums represent the interests of a broad range of stakeholders in the area including the landowners, farming organisations, leisure users, forestry and fishing industries. They have an established presence and are very active within the Kerry UNESCO Biosphere Buffer and Transition Zones, working closely with Kerry County Council and the National Parks and Wildlife Service. As part of this periodic review

process, these groups have been consulted with regard to the new boundaries of the Kerry UNESCO Biosphere Reserve and have been positive about the proposed changes. They have welcomed the opportunity to be part of a Kerry UNESCO Biosphere Advisory Comhairle into the future.

There will be a dedicated Kerry UNESCO Biosphere Reserve Officer (or officers) responsible for ensuring that the actions set out by the Management Council are undertaken. This officer will be responsible for promotion and marketing of the reserve as a separate entity to the Killarney National Park but will work in tandem with the National Park as this is the Core Area of the UNESCO Biosphere Reserve (and is the original UNESCO Biosphere Reserve). The existing resources within the Killarney National Park will be retained but promoted not only as the Killarney National Park but also as the Core Area of the Kerry UNESCO Biosphere Reserve.

A separate Scientific Advisory Committee will also be established. This small committee will comprise representatives from third level institutions and from the Biosphere Management Council. It will be chaired by NPWS and may appoint other scientists on an ad-hoc basis as may be required. The committee will provide scientific advice in relation to the overall UNESCO Biosphere reserve, will work closely with the scientific structures for KNP and it will oversee a collaborative research direction for the wider UNESCO Biosphere reserve. In addition, it will administer a UNESCO Biosphere reserve scientific fund.

The Killarney National Park will continue to be resourced, funded and managed by the NPWS as the Core Area of the Kerry UNESCO Biosphere Reserve. Whilst it is not possible to be definitive with regard to future funding for KNP, it is likely to be of the order of 0.75 – 1 million per annum for current expenditure and 0.5 – 2 million for capital programmes. Funding will also be allocated to the employment of a dedicated UNESCO Biosphere Officer and for the management and promotion of the wider ranging and new Kerry UNESCO Biosphere Reserve. A separate fund to encourage Scientific Research will also be provided.

7.2 Overall framework for governance

The overarching governance in the area of the Kerry UNESCO Biosphere Reserve is through the Local Authority, Kerry County Council. This Authority sets out the governance for the area in a number of plans including the following:

- Kerry County Development Plan
- Killarney Town Development Plan

Development in the area is subject to the Planning and Development Act 2000 (as amended) and to the specific provisions in the various plans as described above.

As mentioned in the previous section, Kerry County Council have had a significant role in advising and liaising with the Killarney National Park UNESCO Biosphere Reserve. The plans and policies of the Authority compliment the objectives of the Killarney National Park UNESCO Biosphere Reserve.

With the expanded Kerry UNESCO Biosphere Reserve, Kerry County Council will be a key member of the Management Council alongside the National Parks and Wildlife Service and it is likely that the dedicated Kerry UNESCO Biosphere Officer will be employed directly by Kerry County Council.

In addition to the overarching governance provided by the Local Authority over the entire area and the specific governance of the Core Area by the National Parks and Wildlife

Service, it is also important to note that the Buffer Area for the Kerry UNESCO Biosphere Reserve is designated for conservation as part of the Natura 2000 Network of sites. The majority of this buffer (and indeed the Core Area) is located within the following Special Areas of Conservation (SACs)

- Killarney National Park, MacGillycuddy Reeks and Caragh River SAC
- Killarney National Park SPA

The ecology of these areas is protected in National legislation through the Birds and Natural Habitats Regulations (2011) and the responsibility for monitoring and enforcing these regulations is with the National Parks and Wildlife Service among other authorities. Similarly, the NPWS have the responsibility for protection of wildlife throughout Ireland under the Wildlife Act (1976 - 2000 (as amended)). This legislative governance is in place throughout the Kerry UNESCO Biosphere Reserve area and supports the specific conservation objectives of the reserve.

7.3 Social impact assessments or similar tools and guidelines used to support indigenous and local rights and cultural initiatives

In the periodic review process that is currently being undertaken, no evidence of any specific evidence of assessments of the rights of the local population were identified. In addition, no evidence of any conflicts or issues relating to the rights of the local population associated with the UNESCO Biosphere reserve were identified. In the extended Kerry UNESCO Biosphere, cooperation and engagement with the local community is among the key objectives for the successful management of the reserve.

7.4 Main conflicts and solutions

There have been a number of identified sources of conflict within the Killarney National Park UNESCO Biosphere reserve to date including but not limited to:

1. Public access
2. Control of Invasive Species (Primarily Rhododendron)
3. Pollution of the watercourses within and surrounding the reserve
4. Deer/Sheep/Goat grazing management within the Reserve

The NPWS, as the managers of the Killarney National Park UNESCO Biosphere Reserve have engaged with many stakeholders within or using the reserve to highlight, discuss and where possible, resolve any potential conflicts that may arise. There is also a forum in the form of the National Park Liaison Committee (which is described in the preceding sections). It meets on a monthly basis and provides a forum for the resolution of conflicts as they arise. Further actions can then be taken by both the NPWS and any stakeholders following the initial discussions. Whilst not all stakeholders are represented on this forum, all can engage with this process and, together with ongoing consultation with various groups on an individual basis, this provides the main mechanism for conflict resolution.

Similarly, the NPWS work closely with Kerry County Council with regard to the planning process and other issues that may influence the Killarney National Park UNESCO Biosphere and the broader region such as wastewater treatment.

7.4.1 Main conflicts regarding access to, or the use of, resources in the area and the relevant timeframe

As the Killarney National Park UNESCO Biosphere Reserve has been confined to the National Park, is in the ownership of a single landowner (The State) and is managed as a

National Park, there is limited potential for conflicts regarding access to resources. Potential conflicts exist in the regulation of hunting and fishing for sport within the Killarney National Park UNESCO Biosphere Reserve.

Fishing in Ireland is primarily regulated by Inland Fisheries Ireland and their habitat and the ecological quality of the lakes and rivers within and surrounding the Killarney National Park UNESCO Biosphere Reserve is protected through the site being a National Park and as an SAC as part of the Natura 2000 Network. The NPWS own the fishing rights within the reserve. There are currently leasing arrangements with 3rd parties.

The management of deer within the Killarney National Park UNESCO Biosphere Reserve has been identified as an issue. It is the responsibility of the NPWS either to directly manage the deer population or to issue licences for hunting in certain circumstances to individuals on adjacent lands. Efforts are currently ongoing to resolve this. Hunting (other than fishing) is not permitted on lands owned by the state for conservation (such as KNP)



Lowland Red Stags (credit: Kathryn Freeman)

7.4.2 Conflicts in competence among the different administrative authorities involved in the management of the area comprising the UNESCO Biosphere reserve

The existing Killarney National Park UNESCO Biosphere Reserve is entirely under the management of one landowner (The State) and managed by one government department (NPWS). The NPWS work closely with the Local Administrative Authority (Kerry County Council) and the objectives of the National Park are supported in the County Development Plan and in the policies of the Council.

There have been no significant conflicts among the administrative authorities involved in the management of the Killarney National Park UNESCO Biosphere Reserve. With the expanded Kerry UNESCO Biosphere Reserve, it will be necessary to have measures in place that ensure that significant conflicts do not occur among numerous landowners and with a wider range of land use objectives.

7.4.3 Means used to resolve conflicts

As discussed above, no significant conflicts between administrative authorities have occurred thus far in relation to the existing KNP UNESCO Biosphere Reserve.

The buffer and Transition Zones of the expanded Kerry UNESCO Biosphere Reserve are managed by numerous landowners and support many land use functions. There is a far higher potential for conflicts to arise among the various stakeholders in the future. The Kerry UNESCO Biosphere Reserve will be managed by a dedicated committee formed from NPWS and Kerry County Council as the key administrative authorities. There will also however be a UNESCO Biosphere Advisory Comhairle with members representing all significant stakeholders such as landowners, Inland Fisheries Ireland, agricultural organisations Coillte (Irish Forestry Body) and any other user groups. There is already well developed collaboration between the stakeholders in the buffer and Transition Zones (as described in previous sections) and following consultation, a willingness and desire to participate on the governing committee of an expanded Kerry UNESCO Biosphere Reserve.

7.5 Community representation, consultation and participation in the UNESCO Biosphere

7.5.1 Representation of local people in the planning and management of the UNESCO Biosphere reserve

As discussed in the preceding sections of the report, there are established structures in place for local community representation within the existing Killarney National Park UNESCO Biosphere Reserve even though it is entirely within the landholding of one owner.

Similarly, the structures that are in place to facilitate community engagement in what are to be the buffer and Transition Zones of the wider Kerry UNESCO Biosphere Reserve have also been explained.

It is noted also that the local stakeholder groups who were consulted as part of the preparation of this periodic review, were keen to be represented on a new Kerry UNESCO Biosphere Reserve Advisory Comhairle.

When appointed, it will be the responsibility of the Kerry UNESCO Biosphere Reserve Officer to ensure the management policies for the reserve are defined, promoted and publicised. The policies will be the subject of public consultation at a number of levels.

A number of surveys of the opinions of the public and users of the reserve will be undertaken in the form of public meetings, street surveys, workshops, open days and on-line surveys (using the UNESCO Biosphere Reserve Website). This type of pro-active engagement will serve to raise the profile of the Kerry UNESCO Biosphere Reserve by targeting people who are not on the management council or among the identified stakeholder groups in the advisory Comhairle (though many may be represented) and increasing the general level of publicity surrounding the reserve. It will provide additional information on how the reserve is currently being used and what the users expect or want from the ongoing management of the reserve. It will also play a role in increasing the sense of ownership of the reserve held by the public. The results of the various surveys and consultations will be collated and used in defining the management policies.

7.5.2 Form of representation

A multi stakeholder advisory committee will be put in place. It is intended that this will be representative of the many landowners, users and interest groups in the extended Kerry UNESCO Biosphere Reserve.

The following is a list of those bodies that are represented on the existing National Park Liaison Committee. These groups have been consulted as part of this periodic review process and are willing to be represented on the UNESCO Biosphere Advisory Comhairle:

List of organisations that are represented on KNP Liaison Committee

Name
KNP Education Centre, Knockreer
Killarney Nature Conservation Group
Muckcross Rowing Club
Killarney Environs Protection Group
Muckcross Community Assoc.
Killarney Rowing Clubs
Red Deer Society
Ross Castle Boatsmen Assoc.
Commercial Boatsmen Assoc.
Walking Group
St. Olivers National School (Education)
Killarney Salmon & Trout Anglers
Lough Lein Anglers
Kerry Co. Co.
Killarney Girl Guides
Disability Access Group
Killarney Chamber of Tourism & Commerce
Killarney Town Jarveys
An Taisce
Water Rescue Group
Muckcross Trustees

The accompanying Supporting Documents, lists all the groups that are represented on the various forums and user groups that operate in the Buffer and Transition Zones for the Kerry UNESCO Biosphere Reserve. These groups have been consulted as part of this periodic review process and have shown interest to be represented on the UNESCO Biosphere Advisory Comhairle.

These organisations cover a wide range of sectors, land uses and activities and are representative of most users of the Killarney National Park UNESCO Biosphere Reserve and the expanded Kerry UNESCO Biosphere Reserve. Most of these groups are run democratically with a constitution and elected officers.



Crinnagh Fields, Killarney National Park (credit: Kathryn Freeman)

7.5.3 Procedures for integrating the representative body of local communities

The procedure for setting up and running the Kerry UNESCO Biosphere Advisory Comhairle is currently being developed. An overall structure has been agreed between the NPWS and Kerry County Council and preliminary consultation with the other stakeholders who are likely to be on the UNESCO Biosphere Advisory Comhairle has been favourable. The details of constitution and representation etc. will be finalised further to continued consultation with those concerned. The governance of other UNESCO Biosphere Reserves is currently being reviewed by Kerry County Council and the NPWS.

7.5.4 How long-lived is the consultation mechanism?

The management of the reserve will be the subject to ongoing and permanent consultation through representation of most stakeholders on the Biosphere Advisory Comhairle.

Management policies will have a lifespan of five years and the consultation will be undertaken with the drafting of new policies.

Any specific projects within the reserve that require planning permission under the Planning & Development Act ((2000) as amended) will also be subject to public consultation under the planning system.

7.5.5 Impact of consultation on the decision-making process

The consultation and public engagement that is undertaken between the UNESCO Biosphere Management Council and the Advisory Comhairle is deliberately designed to allow a high level of stakeholder engagement within the decision making associated with the running of the reserve.

The consultation associated with the preparation of the management policies is designed for a broader range of purposes. It will take the form of press releases, public open days, workshops, blogs etc. This will inform the wider public as of the proposed management

objectives of the reserve over the following five years but will also provide them with the opportunity to comment thereon, with a formal procedure in place for doing so. The comments will be a matter of record and will be available for view. Any comments or submissions will be considered in the defining of the policies.

7.5.6 Public Involvement in UNESCO Biosphere management

Public consultation is part of running of the KNP UNESCO Biosphere Reserve. It is currently being undertaken as part of this periodic review process through the presentations to stakeholders.

The new Kerry UNESCO Biosphere Reserve will have a specifically dedicated officer, website and publicity material. It is intended also to run UNESCO Biosphere events and workshops on an ongoing basis to raise the awareness of the reserve and to promote it as a marketable brand and badge of sustainability. This publicity and ongoing engagement with the public is designed to involve the public in the reserve ethos on a large scale and over a long period of time. The Killarney National Park UNESCO Biosphere Reserve has achieved this through its tourism and education programmes and it is intended to extend this to the Kerry UNESCO Biosphere through dedicated 'UNESCO Biosphere' marketing of events, programmes and information.

7.6 Update on management and coordination structure:

7.6.1 Changes regarding administrative authorities that have competence for each zone

There have been no significant changes regarding administrative boundaries associated with the Killarney National Park UNESCO Biosphere reserve since the nomination of the reserve. Part of what is now the Transition Zone of the Kerry UNESCO Biosphere Reserve was under the jurisdiction of Killarney Town Council, which is no longer in existence, being now represented as part of Kerry County Council. This is not considered to be a significant change in the context of the UNESCO Biosphere reserve.

7.6.2 Information about the manager(s)/coordinator(s) of the UNESCO Biosphere reserve including designation procedures

The current manager of the Killarney National Park UNESCO Biosphere Reserve is the NPWS of the DAHRR&GA, who represent the single landowner in the reserve (The State).

The proposed expansion will require a change to the management structure. The NPWS will still be responsible for the management of the Core Area and land under their ownership. They will also however, sit as one of the principal members of the UNESCO Biosphere Management Council along with Kerry County Council. Other Key Stakeholders will be represented on an Advisory Comhairle as described in previous sections of this report.

7.6.3 Changes with regard to the coordination structure of the UNESCO Biosphere reserve

There have been no changes to the coordination structure to date. The proposals for changes are fully described in the preceding sections of the report and will be under the authority of both Local (Kerry County Council) and central government (NPWS).

7.6.4 Adaption of coordination to suit the local situation

Whilst no changes have been undertaken to date, the proposed changes are designed to adapt to the multiple landowners and greater range of land uses within the buffer and Transition Zones of the expanded Kerry UNESCO Biosphere reserve.

7.6.5 Evaluation of the effectiveness of the coordination of the UNESCO Biosphere

No formal or overall evaluation of effectiveness of the management of the UNESCO Biosphere Reserve has been documented. A section on evaluating the management with regard to achieving the targets of the UNESCO Biosphere Reserve will be included within the defined management policies.

7.7 Update on the management policy

7.7.1 Changes with regard to the management policy and the stakeholders involved

The expanded Kerry UNESCO Biosphere Reserve will require changes to the management structure to provide for greater representation. The mechanisms by which stakeholders will be involved in the day to day running of the reserve (through representation on an advisory Comhairle) and in the development of the management policies is described in detail in the preceding sections.

7.7.2 Contents of the Management Policy

With regard to the extended UNESCO Biosphere Reserve, the management policies will cover the Buffer and Transition Zones, which have never been the subject of a specific management plan in relation to a UNESCO Biosphere Reserve and will involve a far higher level of input from Kerry County Council and a range of other stakeholders. The mechanisms for public and stakeholder engagement and for consultation, liaison and public engagement are described in the preceding sections.

The most comprehensive outline for the management of KNP is set out in the previous KNP Management Plan. The policies and objectives of this plan will remain largely in place. A key measure, which will be initiated in 2017, is the preparation of a scientific Biodiversity Plan for KNP. The key objectives of the expanded Kerry UNESCO Biosphere Reserve supports the following goals and objectives for the Core Area:

- To fully reflect the obligations and goals of UNESCO Biosphere reserves as outlined in the Seville Strategy.
- To fully reflect the objectives of the UN Convention on Biological Diversity.
- To conserve, and where possible enhance, the ecological value of all natural and semi-natural habitats and features.
- To conserve notable plant and animal species and to maintain their populations at adequate levels.
- To conserve and where appropriate, restore and further develop the cultural and heritage features.
- To encourage sustainable recreational and educational use, to provide information and facilities for visitors and to improve public awareness of its natural and cultural heritage.
- To establish and continue effective liaison with all parties with an interest in the management of these areas and to maintain a good relationship with the local community.
- To maintain the aesthetic and other qualities of the site.
- To undertake or facilitate research necessary to achieve the above objectives and to monitor the effectiveness of conservation management.
- To facilitate, promote and undertake scientific research within the UNESCO Biosphere Reserve.
- To establish the Core Area as a "Biodiversity Reference Site".

The Buffer and Transition Areas will provide a support function to these goals and all activities within these areas will be compatible with the overall objectives and will serve to protect the Core Area of the UNESCO Biosphere Reserve.

It will be the responsibility of the Biosphere Management Council to ensure that the achievement of these goals is provided for in a defined management policy encompassing the entire area of the UNESCO Biosphere Reserve.



Blue Eyed Grass (credit: Kathryn Freeman)

7.7-3 Description of the role of the authorities in charge of the implementation of the policies

To date, the authority with the responsibility for KNP and the implementation of its KNP Management Plan was the NPWS

The inclusion of Buffer and Transition Zones in the Kerry UNESCO Biosphere Reserve will require that an expanded system for governance and a wider responsibility for the implementation of new management policies. The mechanism to achieve this has been described above and includes the setting up of a dedicated UNESCO Biosphere Management Council with a continued input from the NPWS but also a far higher level of input from Kerry County Council as a key partner.

In addition, an advisory Comhairle and Scientific advisory committee will be set up to represent the views of a wide range of stakeholders within the area.

7.7-4 Description of how management policies address the objectives of the UNESCO Biosphere reserve

The management objectives directly address the objectives of the UNESCO Biosphere Reserve in that they include and provide for:

- Obligations and goals of UNESCO Biosphere reserves as outlined in the Seville Strategy.

- Objectives of the UN Convention on Biological Diversity.
- The conservation and protection of wild and protected habitats and species through dedicated monitoring and management regimes in the Core Area.
- Promotion and increasing public awareness through tourism, visitor interpretation and educational displays/events.
- Promotion of scientific research.
- Landscape conservation
- Conservation and protection of cultural and heritage features of KNP
- Ongoing and meaningful stakeholder engagement and promotion of partnerships within the local community.

The Buffer and Transition Areas will provide a support function to these goals and all activities within these areas will be compatible with the overall objectives and will serve to protect the Core Area of the UNESCO Biosphere Reserve.

It will be the responsibility of the Biosphere Management Council to ensure that the achievement of these goals is provided for in a defined management policy encompassing the entire area of the UNESCO Biosphere Reserve.

The above objectives are entirely consistent with the requirements for the Core Area of a UNESCO Biosphere reserve. The management policies for the expanded Kerry UNESCO Biosphere Reserve will retain many of the objectives within the KNP Management Plan but will also have regard to the Seville Strategy on UNESCO Biosphere Reserves (2003). The management policies for the extended UNESCO Biosphere Reserve will reflect the wider area included within the UNESCO Biosphere Reserve and the wider range of stakeholders. It will also seek to fully reflect the UN convention on Biological Diversity. There will be a high level of public engagement and greater emphasis on the human and cultural involvement and participation in the management of the reserve. The appointment of a dedicated UNESCO Biosphere Officer with responsibility for the promotion of the reserve will raise public awareness and promote networking and twinning with other UNESCO Biosphere Reserves around the world. The management of sustainable development practices and activities within buffer and Transition Zones will be provided for.

7.7.5 Progress with regard to the guidelines of the management policies

KNP has been and will continue to be managed as a National Park by the state. It forms the core area of the BR. The primary purpose is and will continue to be the conservation of biological diversity, and scientific and educational endeavour in support of that. The management structures that are already in place for KNP provide a solid baseline from which to design and implement new management policies for the expanded Kerry UNESCO Biosphere Reserve.

Whilst the management policy is at a preliminary stage as regards the new Kerry UNESCO Biosphere Reserve, there have been extensive consultations between Kerry County Council and the NPWS. A draft framework for management and governance of the Kerry UNESCO Biosphere Reserve is being prepared and the main components of this draft have been described in the preceding sections. The main stakeholders (additional to the key NPWS and KCC) have been consulted during a series of meetings and presentations. The feedback received from this consultation was very positive with most stakeholders actively seeking engagement and wanting to 'be a part' of the UNESCO Biosphere Reserve and none with any serious objections to the expanded reserve. This is good progress with regard to the preparation and finalisation of a system of governance and management policies for the expanded Kerry UNESCO Biosphere Reserve.

7.7.6 Factors and/or changes that impeded or helped with the implementation of the management policies

KNP is a National Park that is owned and managed by the state for the primary purpose of nature conservation. Considerable resources, both financial and human have been devoted to the management of KNP for these purposes and are the primary factors in the implementation of the management policies therein. In addition, there has been a high level of co-operation between the Liaison Committee and the NPWS along with the good relationship with KCC, which has made the implementation of the plan easier. A high degree of community engagement and support assists in the ongoing management of KNP. It is from this strong foundation that the management framework for the expanded Kerry UNESCO Biosphere Reserve will be delivered.

The implementation of the plan was at times impeded by the lack of required funding or resources (due to economic conditions beyond the control of the reserve managers) but these affected outputs and delivered objectives but not the system of governance.

7.7.7 Description of how the UNESCO Biosphere reserve is integrated in regional/national strategies

A review of how the UNESCO Biosphere reserve is integrated into regional and national strategies is provided below.

Spatial Planning Strategies

Sustainability and the protection of our environment, biodiversity and habitat are requirements that are widely accepted and echoed within national, regional, and local planning strategies throughout Ireland.

At a national level the Government is advancing the preparation of a new National Planning Framework 'Ireland 2040 Our Plan' (NPF) with a draft plan anticipated mid 2017. The plan will provide a framework for investment and development in Ireland over the next twenty years and it will supersede the 2002-2020 National Spatial Strategy. The Issues Paper which was released in February 2017 highlights the growth and change expected in Ireland over the next twenty years and acknowledges the environmental requirements which need to be met. The paper highlights the threats to Ireland's habitats and species through flooding, wetland drainage/reclamation or infrastructural development, water pollution and unsustainable exploitation such as over-fishing and peat extraction. In response to such challenges the paper suggests the development of a tool kit of options to ensure greater environmental coherence when planning for future growth such as the inclusion of green infrastructure planning and coherent landscape classification as part of mainstream plan making. The NPF will be subject to a Strategic Environmental Assessment to address the environmental consequences of implementing the plan.

In the regional context, the 'South -West Regional Planning Guidelines 2010-2020' (RPG's) provide strategic guidance to steer the future strategic growth and overall sustainability of the region (Cork City/County and County Kerry) over the medium to long term. The RPG's highlight as a key issue (RKI-01) the diverse range of habitats of national and international importance and emphasise the importance of conservation and sustainable use of biodiversity in providing for development of the region.

Local Plans

The core transition and Buffer Areas of the UNESCO Biosphere lie entirely within the functional area of the Kerry County Council Development Plan 2015-2021 (KCDP). In addition, Killarney town, which lies within the Transition Area, is also covered by the

Killarney Town Development Plan 2009-2015 (KTDP) This plan has equal weight to the KCDP and it has been extended and is expected to run until the expiry of the KCDP in 2021. The boundary of the KTDP in the context of the UNESCO Biosphere is illustrated on Figure 7.1.

The National Parks and Wildlife Service has prepared a Management Plan for Killarney National Park 2005-2009. The National Park coincides with the boundary of the UNESCO Biosphere Core Area. This plan sets out a framework for the conservation of the natural and built heritage throughout the park.

Killarney Town Development Plan 2009-2015 (KTDP)

The KTDP outlines the Council policies and objectives for the development of Killarney town.

Chapter 1 of the plan sets out the key objectives. The importance of the protecting and managing the natural and built environment and the significance of connecting nature and culture is recognised by the following key objectives:

'To protect, conserve and enhance the built and natural heritage of Killarney town for present and future generations.'

'To develop a recreational and amenity corridor incorporating the National Park, the rivers, streams and woodlands along with developing a network of green spaces in the promotion of Killarney as a green and healthy town.'

The social inclusion strategy (Chapter 4) also recognises the contribution of natural heritage and its affiliation with recreation in working towards a participative society. The development of an 'integrated green network' for the town encompassing parks, rivers and woodlands is envisaged to *'promote cultural continuity and the encouragement of sustainable use and management of Killarney's natural features.'* Policy statements SI-09 and SI-09 reflect this objective. The integrated green network is further referenced within Chapter 9 (below). The plan notes that providing an integrated green network will ensure that the elements of the natural environment are protected and managed.

In relation to tourism the plan acknowledges the wealth of ecological resources in and around the town which are a significant influence on tourist visits. It is further acknowledged that there is a balance to be met between tourism and ecology. The plan thus includes policy TOUR – 03 which seeks to monitor tourist usage of sensitive areas, protect natural resources and liaise with strategic partners to identify land use strategies which focus on the tourism, environmental and heritage value of these areas.

On the subject of natural heritage, biodiversity and conservation (Chapter 9) the stated aim of the plan is *'to manage, protect and enhance those features which have enriched the town and its people and to ensure its distinctive and unique qualities that attributes to the identification of Killarney town.'* The KTDP, identifies the following designations:

European Sites - Natura 2000

The town plan area encompasses part of the following significant habitats which are protected under European legislation:

- Killarney Lakes Special Protection Area (SPA) site code 004038
- Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment Special Area of Conservation (SAC) site code 000365.

These sites in the context of the UNESCO Biosphere are shown on Figure 7.2 and 7.3.

The KTDP notes that the aim of the Natura 2000 network is to assure the long-term survival of Europe's most valuable and threatened species and habitats. It is not a system of strict nature reserves where all human activities are excluded. Where proposals are made on lands subject to SAC or SPA designation an Appropriate Assessment process is triggered.

National Designations

In addition to these European sites the Wildlife Act 2000 provides for the designation of areas as Natural Heritage Areas (NHA) and proposed Natural Heritage Areas (pNHA). The Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment is designated as a proposed Natural Heritage Area and they all form part of the UNESCO Biosphere. These sites are of significance for wildlife and habitats. The proposed NHA boundary generally coincides with that of the SPA's and SAC's mentioned above. The proposed NHA designation imposes a requirement on Planning Authorities to recognise ecological value. The proposed NHA boundary is identified on Figure 7.4.

Other Relevant Conservation Designations

Section 9 of the plan identifies the Killarney National Park and significance of the Killarney National Park Management Plan. Policy NO-04 sets out the Council commitment to conservation and management in the Killarney National Park as follows.

'Policy NH-04

It is a policy of the Council:

- a. To commit to the conservation objectives in the Killarney National Park Management Plan 2005-2009*
- b. To maintain the conservation value of the Killarney National Park as a European site (365 and 4038), a National Park and a UNESCO Biosphere Reserve and the cSAC's Rivers Flesk and Deenagh during the lifetime of the plan*
- c. To protect species listed in Annex IV of the Habitats Directive occurring in the Killarney Area (otter, bat species, Kerry slug)*
- d. To protect and conserve all designated SPA's and cSAC's and to put in place mitigation measures to protect their special natural characteristics*
- e. To request for all applications to submit environmental assessments indicating mitigating measures in eliminating effects to the environment and water quality*
- f. To encourage and promote the principles of sustainable development with a specific aim of protecting the environment*
- g. To seek to achieve a sustainable pattern of development which will facilitate the conservation of natural resources and habitats and minimise pollution*
- h. To liaise with the Department of the Environment, Heritage and Local Government to ensure the sustainable recreational and educational use of the National Park and to maintain the aesthetic and other qualities of the Park and its environs*
- i. To protect areas designated with National and International conservation status so to ensure that the habitats of wildlife are maintained*
- j. To consult with the National Parks and Wildlife Section of DEHLG regarding any planning applications located within or adjacent designated cSAC, SPA's or pNHA's.*
- k. To take cognisance of existing cSACs, pNHA's and SPA's when processing planning applications. Development within or impinging on these sites, may be required to submit an Environmental Report or a full Environmental Impact Assessment*
- l. To conserve, protect and enhance features of the natural environment, essential for its enjoyment and maintenance as a distinctive wildlife habitat, which is important in local, national and international terms*

m. To co-operate with the National Parks and Wildlife Service in the conservation of the Killarney National Park and in the control and management of invasive species both on land and in water

n. To protect Annex 1 - Habitats and Annex II - Animal and Plant species of Council Directive 92/43/EEC on the conservation of natural Habitats and of wild fauna and flora

o. To protect against invasive species including garden centre invasive species that are used for native local plant species in habitat recreation and landscaping (see Appendix 6 for suitable planting in the Killarney area)

p. To ensure that wherever brownfield sites are being developed there will be no negative impacts on roosting bats. All demolition works will be constructed in full consultation with the National Parks and Wildlife Services staff (NPWS). Where renovation works or demolition

works take place within or immediately adjacent to the boundary of the Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment cSAC, a screening determination for an Appropriate Assessment of potential impacts on the cSAC will be carried out

q. To ensure that wherever demolition or renovation of Protected Structures, or any other buildings occurs, that there will be no negative impacts on roosting bats. All demolition or renovations works will be in full consultation with the National Parks and Wildlife Services staff (NPWS). Where renovation works or demolition works take place within or immediately adjacent to the boundary of the Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment cSAC, a screening determination for an Appropriate Assessment of potential impacts on the cSAC will be carried out. Specifically, conditions on granting planning permission for a development close to designated sites or sensitive habitats.'

Landscape Preservation

Section 9.20.4 of the plan refers to landscape visual amenity. It states:

There will be a presumption against development where the proposed development is deemed to:

- Have a substantial adverse effect on a scenic vista
- Substantially degrade the existing visual character or quality of the site and its surroundings
- Require substantial terrain modifications
- Significantly alter public views or viewing corridors
- Create a new source of substantial light or glare which would adversely affect day or night time views in the area
- Result in a building scale that is not consistent with the surrounding community

Chapter 10 refers to built heritage. The stated aim in this regard is '*to protect Killarney's built heritage through the balancing of conservation and development objectives.*' The KTDP identifies the following designations:

Architectural Heritage

The KTDP includes a Record of Protected Structures. There are currently 68 items listed on the record which fall within the UNESCO Biosphere Transition Area of Killarney town environs, they are identified on Figure 7.5.

Archaeological Heritage – Record of Monument and Places (RPM)

Killarney has a unique archaeological heritage which provides a rich historical identity and resource for the town. There are 54 monuments listed on the RPM which fall within the UNESCO Biosphere Transition Area of Killarney town and its environs, they are identified on Figure 7.5.

Kerry County Council Development Plan 2015-2021 (KCDP)

The core, buffer and Transition Areas of the UNESCO Biosphere are all located within the functional area covered by the KCDP. This plan sets out the aims, objectives, policies and guidelines to provide for the proper planning and sustainable development of County Kerry. The plan includes seven goals one of which is to *'protect and enhance the natural and built environment'*.

This goal is reflected in the strategic aims of the core strategy (Chapter 2) which include:

- *Protect and conserve the heritage of the County by safeguarding its cultural, natural and built heritage.*
- *Support sustainable tourism development in Kerry and strengthen the contribution that tourism makes to the local communities, culture and economy of the County.*

Chapter 5 of the plan refers to Tourism. The trend away from tour based tourism towards individuals seeking their own tailored experiences is highlighted. The need to coordinate land use planning and transportation policies to provide the necessary infrastructure is seen as a priority. Nonetheless the need to balance these requirements with the sustainability of the ecological and heritage resources is identified. The plan therefore provides a policies and objectives which will strive for a more diversified and sustainable tourism sector. The following tourism objectives are directly relevant to the UNESCO Biosphere:

'T-3

Facilitate the development of a sustainable and diversified tourism industry through the growth of niche markets in a socially, environmentally and economically sustainable manner.'

'T-4

Protect conserve and where appropriate enhance through the enforcement of the objectives and development standards of this Plan, the natural, built and cultural heritage features that form the basis of the County's tourism industry, including biodiversity, areas of important landscape, coastal scenery, areas of geological and scientific interest, historic buildings, archaeological sites and monuments and the traditional form and general appearance of towns and villages.'

'T-6

Liaise with strategic partners such as Fáilte Ireland (South West Region), the National Parks and Wildlife Services, Inland Fisheries Ireland, Waterways Ireland, Coillte and other relevant bodies on the identification of land use strategies for areas, focusing on their tourism, environmental and heritage value.'

The natural environment of the UNESCO Biosphere is afforded protection through the strategic objectives set out in Chapter 10 of the plan. These objectives seek to conserve, manage and enhance the County's natural heritage (NE-1); ensure that the relevant national and EU legislation are met (NE-2); and raise awareness of natural heritage and promote sustainable public participation in environmental and planning matters (NE-3).

European sites (SAC's and SPA's) together with the nationally designated proposed Natural Heritage Area within the UNESCO Biosphere are illustrated at Figure 7.2 - 7.4.

The benefits to human populations of green infrastructure, beyond recreation, through water purification, flood control, carbon capture and food production are encompassed in

objective NE-42 which seeks to protect, enhance and provide green infrastructure throughout the County.

The UNESCO Biosphere reserve is specifically referred to at Section 10.2.1 of the plan.

Chapter 11 of the plan considers built and cultural heritage. The management and protection of built and cultural heritage is recognised in the plan as significant in terms of the potential social and economic benefits.

Section 10.2.4 of the plan refers to National Parks and acknowledges the significance of internationally important features within the National Park. In this regard objective NE-12 seeks to maintain the nature conservation value and integrity of the Killarney National Park. The commitment to the protection of architectural and archaeological heritage is recognised nationally through both the Planning and Development Act 2000 and the National Monuments Act 1930.

Architectural Heritage

The KCDP includes a Record of Protected Structures. This record is extensive. Most of the protected structures within the UNESCO Biosphere fall within the KTDP area with a small number being spread through the remainder of the UNESCO Biosphere area. The protected structures within the UNESCO Biosphere are identified in Figure 7.5.

Archaeological Heritage – Record of Monument and Places (RMP)

There are numerous archaeological sites listed on the National Record of Monuments and Places (RMP) throughout the UNESCO Biosphere area. These are illustrated in Figure 7.5.

Land Use Zoning and Landscape Sensitivity

The protection of County Kerry's landscape is a key objective of the KCDP (objective ZL-1). The landscapes of the County are an important economic asset and a factor in quality of life for its residents and visitors.

The plan includes a Landscape Character Assessment (LCA) (objective ZL-2). A LCA identifies 'landscape character types' (distinct landscape types); 'landscape character areas' (geographically specific landscape types); 'landscape values' (values are derived from environmental and cultural beliefs) and 'landscape sensitivity' (sensitivity can change depending on landscape character and values). The zoning designations of the land throughout the County consider the landscape character within the LCA and the sensitivity of the landscape and its ability to absorb development. The Core Area of the UNESCO Biosphere area is entirely designated as 'prime special amenity area' which are described in the plan as *'those landscapes which are very sensitive and have little or no capacity to accommodate development.'* The transition and Buffer Areas of the UNESCO Biosphere are included in both the prime special amenity area and the 'secondary special amenity area'. The secondary special amenity areas are described by the plan as areas that are sensitive to development and where development needs to be designed to minimise the effect on the landscape. These landscape sensitivity designations in the context of the UNESCO Biosphere are identified on Figure 7.6.

The plan includes two objectives (ZL-5 and ZL-6) which seek to protect and conserve significant views and prospects adjoining public roads throughout the County. The UNESCO Biosphere includes approximately 50 kilometres of views and prospects which are identified in the context of the UNESCO Biosphere in Figure 7.6.

Summary

The national, regional, and local plans identified and discussed above set in place objectives, policies and guidelines which seek to protect, enhance and manage the unique and special natural, built and cultural heritage within the UNESCO Biosphere. A key theme which runs through the objectives at a local level is the significant relationship to be fostered between communities and their natural, cultural and built heritage. These objectives compliment the overall objectives of the UNESCO Biosphere Reserve programme.

8 CRITERIA AND PROGRESS MADE

Brief justification of the way in which the UNESCO Biosphere reserve fulfils each criteria of article 4 of the Statutory Framework of the World Network of UNESCO Biosphere Reserves:

1. "Encompass a mosaic of ecological systems representative of major biogeographic region(s), including a gradation of human interventions".

Whilst the KNP UNESCO Biosphere Reserve is identified as being within the British Islands Biogeographic Province of the Palaeartic Region in Udvardy's 1975 paper, the European Commission includes the British Isles and Ireland as being within the Atlantic Region. This is described regarding nature conservation and the Natura 2000 network on the European Commission website http://ec.europa.eu/environment/nature/natura2000/platform/knowledge_base/143_atlantic_region_en.htm

The European Commission document referenced above provides a brief description of the main habitat types and species that are protected (under the Natura 2000 Network) in the Atlantic Region. Whilst many are coastal and therefore do not apply to the Kerry UNESCO Biosphere Reserve, the report specifically mentions Atlantic Wet Heaths, Blanket Bog, Sessile Oak woodlands, Marsh Fritillary and Yew woodlands. KNP and the surrounding area provides a stronghold for the afore mentioned habitats and species along with other habitats (such as lakes and rivers) that are not specifically mentioned in the document but are nonetheless representative of the Atlantic Region.

The proposed Kerry UNESCO Biosphere Reserve including the Core Area of KNP exhibits a complex mosaic of some of habitats that are either unique to the Atlantic Region (Yew woodlands and Sessile Oak woodlands) or are in serious decline within the region as a result of various pressures such as population increase and agricultural intensification. The existing framework for governance of the area provides for the strict protection of these species and habitats along with allowing for human activity, tourism, education, agriculture and conservation of heritage. The proposed Kerry UNESCO Biosphere Reserve will continue with this approach and will raise the profile of this aspect of the UNESCO Biosphere as representative of natural habitats within the Atlantic Region.

2. "Be of significance for biological diversity conservation".

KNP and the wider Kerry UNESCO Biosphere Reserve is located in one of the most natural and biodiverse areas in Ireland. The core area of the UNESCO Biosphere Reserve is designated as a National Park. This is the highest national measure for the conservation of biological diversity in Ireland. The core and Buffer Areas of the proposed Kerry UNESCO Biosphere Reserve are designated in their entirety for the protection of a number of Habitats and Species that are listed on Annexes I & II of the EU Habitats Directive and on Annex I of the birds Directive and form part of the Killarney National Park, MacGillycuddy Reeks & Caragh River SAC along with the Killarney National Park SPA. The many habitats and species that are specifically protected by the above designations are set out in the preceding sections.

The National Biodiversity Data Centre (NBDC) organises an annual BioBlitz (<https://bioblitz.ie>) engaging the public to record as many species as possible within 24 hours. KNP won the 2011 event with a total of 1088 species recorded within 24 hours.

It is well known and clear that KNP and the surrounding area is of crucial significance for biodiversity at national, European and global (in terms of biogeographical representation) scales. The existing KNP UNESCO Biosphere Reserve is primarily concerned with the

conservation of this biodiversity. It is proposed to increase resources for the monitoring and recording of habitats and species both within and outside the Core Area of the reserve. A dedicated Scientific Advisory committee will be established along with additional funding for scientific research within the biosphere reserve. It is proposed to establish KNP as a 'Biodiversity Reference Site' and as a first step in achieving this, an 'all taxa Biodiversity Inventory' of the park is proposed.



Primroses (credit: Kathryn Freeman)

3. "Provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale".

The Kerry UNESCO Biosphere Reserve is governed at the regional scale by the relevant development policies and plans as set out by the Local Authority (Kerry County Council). These include policies for sustainable development within the region as discussed in previous sections of the report.

Tourism is among the major industries in the region, and KNP/the natural heritage of the area is crucial to that sector. There is an opportunity to market the Kerry UNESCO Biosphere Reserve as a key eco-tourism destination, promoting sustainable tourism, hand in hand with conservation. The tourism industry in the area is already aware of the need to conserve the natural heritage in order to safeguard the industry with initiatives such as 'Phosphate free laundry' in hotels in Killarney Town.

Another opportunity for the UNESCO Biosphere Reserve to promote sustainable development is through branding of the Kerry UNESCO Biosphere Reserve. It is intended that the Kerry UNESCO Biosphere brand will be used to promote sustainable, 'green' products such as foodstuffs produced within the reserve. This will foster environmentally friendly activities and practices within the reserve.

4. "Have an appropriate size to serve the three functions of UNESCO Biosphere reserves".

The existing KNP UNESCO Biosphere Reserve was not of a sufficient size to support the three necessary functions and as part of this periodic review process it is proposed to significantly extend the reserve to address this.

The proposed Kerry UNESCO Biosphere Reserve extends over 65,760 ha (or 658 square kilometres) of terrestrial area. Due to its inland location, no marine areas are proposed. The proposed areas comprise all areas of the Lough Leane catchment and the MacGillycuddy Reeks mountain range.

The proposed areas are large enough to meet the long-term conservation objectives of the Core Area and Buffer Zone. In addition, the Transition Zone, as proposed, is appropriate for working with local communities in testing and demonstrating sustainable uses of natural and cultural resources.

	Previous Report (nomination form or periodic review) and date)	Proposed Changes (if any)
Area of terrestrial Core Area	Total UNESCO Biosphere = 10,129 ha	Core Area = 10,370 ha
Area of terrestrial Buffer Zone	0	Buffer Zone = 24,010 ha
Area of terrestrial Transition Area	0	Transition Area= 31,380 ha

5. Appropriate zonation to serve the three functions

The existing KNP UNESCO Biosphere Reserve does not exhibit appropriate zonation such that it serves the functions of the core, buffer and Transition Zones. It is therefore proposed to retain KNP (and small additional areas that are within state ownership) as the Core Area of the reserve but to substantially increase the area of the reserve to establish the necessary Buffer and Transition functions. This proposal along with relevant maps are fully described in Section One of this periodic review report and it is demonstrated exactly how the requirements for each function are met.

6. "Organizational arrangements should be provided for the involvement and participation of a suitable range of inter alia public authorities, local communities and private interests in the design and the carrying out of the functions of a UNESCO Biosphere reserve".

The KNP UNESCO Biosphere Reserve was managed primarily by the NPWS, being representatives of the Irish State on lands under their ownership. The NPWS work very closely with a wide and diverse range of stakeholders including through the National Parks Liaison Committee and also with Kerry County Council as the governing local authority.

In the future, the expanded reserve will cover a far increased number of landowners and stakeholders as the physical area occupied increases. To correspond with this, the responsibility for governance and management will also change. A new governance and liaison structure will be established. NPWS and Kerry County Council will be the principal partners in the Kerry UNESCO Biosphere Reserve and will form a Biosphere Management Council with the overall responsibility for management of the UNESCO Biosphere Reserve. This Council will be responsible for the development and implementation of the

management policy for the reserve and ensuring that goals and objectives are met. A dedicated Kerry UNESCO Biosphere Reserve Officer (or officers) will be appointed and will report to the Council. This officer will be responsible for implementing actions as set out by the Council.

A Kerry UNESCO Biosphere Advisory Comhairle will be established (“Comhairle” meaning “Council” in the Irish language), comprising stakeholders within the new wider UNESCO Biosphere. This Comhairle will advise the Biosphere Management Council. Stakeholder engagement thus far has shown significant interest in participation on the Advisory Comhairle.

A separate Scientific Advisory Committee will also be established. This small committee will comprise representatives from third level institutions and from the Biosphere Management Council. It will be chaired by NPWS and may appoint other scientists on an ad-hoc basis as may be required. The committee will provide scientific advice in relation to the overall UNESCO Biosphere reserve, will work closely with the scientific structures for KNP and it will oversee a collaborative research direction for the wider UNESCO Biosphere reserve. In addition, it will administer a UNESCO Biosphere reserve scientific fund.

The structure for governance is more fully described in Section 7 of this report and demonstrates that there will be comprehensive structures & processes in place for the involvement of public authorities, landowners, community groups and a wide range of stakeholders.

7. Mechanisms for implementation:
 - a) **Mechanisms to manage human use and activities**
 - b) **Management policy or plan**
 - c) **Authority or mechanism to implement this policy or plan**
 - d) **Programmes for research, monitoring, education and training**

The main mechanisms for the implementation of the above criteria are in place for the Core Area of the proposed Kerry UNESCO Biosphere Reserve through the existing management regime that is in place. Human use and activities are managed through collaboration between NPWS Staff and inter alia the National Park Liaison Committee (representing a broad range of stakeholders). Extensive ongoing research is undertaken by a range of colleges and third level institutions with monitoring of habitats and species also being undertaken by NPWS staff. The NPWS also run the KNP Education Centre that provides education and training on the environment and biodiversity (among other related topics).

These mechanisms are more fully described in the relevant sections of the report.

8. Cooperative activities with other UNESCO Biosphere reserves

At the national level:

There is only one other UNESCO Biosphere Reserve in Ireland. This is the Dublin Bay UNESCO Biosphere, which is a coastal site with few ecological similarities with the Killarney UNESCO Biosphere Reserve. There have been no cooperative activities between the two reserves (with the exception of providing advice relating to the periodic review process) to date.

Despite the differences in ecology between the two reserves, there are good opportunities for collaboration into the future with potential ‘UNESCO Biosphere’ promotion and publicity.

Both the Kerry and Dublin UNESCO Biosphere Reserves propose to hold annual conferences. This is an ideal opportunity for those involved in the reserves to meet and to

share common issues and information and to provide advice, support and guidance to one another.

At the regional level:

During the preparation of this periodic review, no evidence of cooperation with other UNESCO Biosphere reviews within the Atlantic Region was recorded. It is hoped that the proposed expansion of the reserve and its promotion as the Kerry UNESCO Biosphere Reserve with a dedicated management council and officer, will create opportunities for far higher levels of cooperation with other reserves both on a scientific level and with regard to sustainable development.

Through twinning and/or transboundary UNESCO Biosphere reserves and within the world network:

During the preparation of this periodic review, evidence of collaboration between KNP UNESCO Biosphere Reserve and Waterton Lakes in Canada to produce a commemorative postage stamp (Canadian) in 2005.

This highlights the potential for twinning on a promotional and marketing level but there is also potential for additional scientific/conservation collaboration and networking. This will be the subject of further exploration with the Kerry UNESCO Biosphere Reserve and resources will be made available for this purpose.

Obstacles encountered, measures to be taken and, if appropriate, assistance expected from the Secretariat:

Whilst it is considered that the management of KNP since the establishment of the UNESCO Biosphere in 1982 has fulfilled the requirements for the Core Area of a UNESCO Biosphere Reserve, it is noted that it was not marketed or promoted as a UNESCO Biosphere Reserve to a significant degree – it was marketed as a National Park. In the future, the Kerry UNESCO Biosphere Reserve will cover a far wider area and will encompass not just KNP but a far wider area. It will be managed by a dedicated UNESCO Biosphere Management Council and will have a dedicated UNESCO Biosphere Officer. It will be marketed as a UNESCO Biosphere Reserve and a UNESCO Biosphere Brand will be promoted.

Whilst vast amounts of data as to the usage, management and research of KNP UNESCO Biosphere were available, it is known that far more valuable work has been undertaken within the UNESCO Biosphere Reserve, for which information was either not available or not found during the periodic review process. This is particularly relevant from the early life of the reserve as this was over 30 years ago.



Red Squirrel (credit: Paudie O'Leary)

Main objectives of the UNESCO Biosphere Reserve:

- To fully reflect the obligations and goals of UNESCO Biosphere Reserves as outlined in the Seville Strategy.
- To fully reflect the objectives of the UN Convention on Biological Diversity.
- To conserve, and where possible enhance, the ecological value of all natural and semi-natural habitats and features.
- To conserve notable plant and animal species and to maintain their populations at adequate levels.
- To conserve and where appropriate, restore and further develop the cultural and heritage features.
- To encourage sustainable recreational and educational use, to provide information and facilities for visitors and to improve public awareness of its natural and cultural heritage.
- To establish and continue effective liaison with all parties with an interest in the management of these areas and to maintain a good relationship with the local community.
- To maintain the aesthetic and other qualities of the site.
- To undertake or facilitate research necessary to achieve the above objectives and to monitor the effectiveness of conservation management.
- To facilitate, promote and undertake scientific research within the UNESCO Biosphere Reserve.

9 SUPPORTING DOCUMENTS

File Name	Form	Description of content
MAPS		
Location and Zonation Map	Hard copy – Annex	Kerry UNESCO Biosphere Reserve zones on a topographic map.
Location and zonation map	Soft copy – CD ROM	Shapefiles of Kerry UNESCO Biosphere Reserve zones (WGS84)
Annex I Habitat Map	Hard copy - Annex	A map of KNP UNESCO Biosphere Reserve (Core Area) showing habitats listed under Annex I of the EU Habitats Directive (BEC Consultants, 2011)
Fossitt Habitat Map	Hard copy – Annex	A map of KNP UNESCO Biosphere Reserve (Core Area) showing habitats classified per Fossitt (2000) (BEC Consultants, 2011)
CORINE Land Cover Map	Hard copy – Annex	Landcover map for Kerry UNESCO Biosphere Reserve created with data from the European Environment Agency (2012)
LEGAL DOCUMENTS		
Site Synopsis KNP SPA	Soft copy – CD ROM	Brief description of Killarney National Park SPA; updated July 2014
Natura 2000 Standard Data Form KNP SPA	Soft copy – CD ROM	Form listing site identification, location, description, protection status and management as well as ecological information and map of Killarney National Park SPA; updated October 2015
Conservation Objectives KNP SPA	Soft copy – CD ROM	List of conservation objectives for Killarney National Park SPA; updated August 2016
Site Synopsis Eirk Bog SPA	Soft copy – CD ROM	Brief description of Eirk Bog SPA; updated February 2013
Natura 2000 Standard Data Form Eirk Bog SPA	Soft copy – CD ROM	Form listing site identification, location, description, protection status and management as well as ecological information and map of Eirk Bog SPA; updated October 2015
Conservation Objectives Eirk Bog SPA	Soft copy – CD ROM	List of conservation objectives for Eirk Bog SPA; updated August 2016
Site Synopsis Castlemaine Harbour SAC	Soft copy – CD ROM	Description of Castlemaine Harbour SAC including habitats and species from the E.U. Habitats Directive it was selected for; updated December 2015
Natura 2000 Standard Data Form Castlemaine Harbour SAC	Soft copy – CD ROM	Form listing site identification, location, description, protection status and management as well as ecological information and map of Castlemaine Harbour SAC; updated December 2015
Conservation Objectives Castlemaine Harbour SAC	Soft copy – CD ROM	Extended information conservation objectives for each selection species and habitat in Castlemaine Harbour SAC and SPA as well as maps of the area; updated July 2011
Site Synopsis KNP, MCGR & CRC SAC	Soft copy – CD ROM	Description of Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment SAC including habitats and species from the E.U. Habitats Directive it was selected for; updated August 2013
Natura 2000 Standard Data Form KNP, MCGR & CRC SAC	Soft copy – CD ROM	Form listing site identification, location, description, protection status and management as well as ecological information and map of Killarney National Park,

File Name	Form	Description of content
		MacGillycuddy Reeks and Caragh River Catchment SAC; updated October 2015
Conservation Objectives KNP, MCGR & CRC SAC	Soft copy – CD ROM	List of conservation objectives for Killarney National Park, MacGillycuddy Reeks and Caragh River Catchment SAC; updated August 2016
MANAGEMENT PLANS		
Management Plan for Killarney National Park 2005-2009	Soft copy – CD ROM	Management Plan for Killarney National Park, published by NPWS 2005
Killarney Town Development Plan 2015-2021	Soft copy – CD ROM	Development Plan for Killarney Town adopted by Kerry County Council 2015
Kerry County Development Plan 2015-2021	Soft copy – CD ROM	Development Plan for County Kerry adopted by Kerry County Council 2016
Kerry Local Economic and Community Plan 2016-2021	Soft copy – CD ROM	Local Economic and Community Plan for County Kerry adopted by Kerry County Council 2016
County Kerry Tourism Strategy and Action Plan 2016-2021	Soft copy – CD ROM	Tourism Strategy and Action Plan for County Kerry adopted by Kerry County Council and Destination Kerry Tourism Forum 2016
SPECIES LIST		
Species List	Hard copy – Annex	List of important plants and animals found in Killarney National Park plus their protection status. Extracted from the Management Plan for Killarney National Park (2005)
BioBlitz species list	Hard copy – Annex	List of species recorded in KNP during 24hr intensive biological recording event held in 2011.
MAIN BIBLIOGRAPHIC REFERENCES		
Bibliography	Hard copy – Annex	Report bibliography
KNP Studies	Hard copy – Annex	List of studies carried out (fully or partially) in Killarney National Park within the last 10 years (2007 – 2017)
PROMOTIONAL MATERIAL		
Photographs	Soft copy – CD ROM	A small selection of photographs depicting the MacGillycuddy Reeks provided by Kerry County Council.
Photographs	Soft copy – CD ROM	A selection of photographs depicting KNP provided by NPWS
Agreement	Soft copy – CD ROM	Two signed agreement granting non-exclusive rights to promotional photographs.
Video Links	Soft copy – CD ROM	Email with links to videos depicting Killarney National Park.
FURTHER SUPPORTING DOCUMENTS		
Stakeholders	Hard copy – Annex	List of Attendees at Consultation Presentations & Meetings; List of stakeholders represented.
Stakeholder Comments	Hard copy -Annex	Comments gathered during stakeholder meetings.
Press	Hard copy - Annex	News items published in relation to the periodic review and proposed biosphere expansion.
Article 17 assessment	Soft copy	Selection of studies carried out (whole or partially) in

File Name	Form	Description of content
form and audit trail for <i>Najas flexilis</i>	– CD ROM	KNP UNESCO Biosphere Reserve
Delivering Integrated Catchment Management through the bottom-up approach	Soft copy – CD ROM	
Distribution and population dynamics of the Kerry Slug <i>Geomalacus maculosus</i> (Arionidae)	Soft copy – CD ROM	
Killarney Resident Survey 2010	Soft copy – CD ROM	
Killarney Visitor Survey 2010	Soft copy – CD ROM	
National survey of native woodland in Ireland	Soft copy – CD ROM	
National survey of native woodlands 2003-2008	Soft copy – CD ROM	
Results of a monitoring survey of old sessile oak woods and alluvial forests	Soft copy – CD ROM	
Species dossier, range and distribution data for the Hairy Wood Ant, <i>Formica lugubris</i> in Ireland	Soft copy – CD ROM	
The beetles of decaying woodland in Ireland	Soft copy – CD ROM	
The re-introduction of the White-tailed eagle to Ireland	Soft copy – CD ROM	
Water Framework Directive Fish Stock Survey of Lough Caragh, August 2011	Soft copy – CD ROM	
Water Framework Directive Fish Stock Survey of Lough Leane, September 2014	Soft copy – CD ROM	
Water Framework Directive Fish Stock Survey of Upper Lake, September 2014	Soft copy – CD ROM	
Adopt a Woodland Scheme	Soft copy – CD ROM	

10 ADDRESSES

10.1 Contact address of the proposed UNESCO Biosphere reserve:

Name: NPWS Regional Manager
Street or P.O. Box: Killarney National Park
City with postal code: Muckross House, Killarney, Co. Kerry
Country: Ireland
Telephone: 064 6670144
E-mail: frances.o'sullivan@ahg.gov.ie
Web site: <http://www.killarneynationalpark.ie/>

Name: Cathy Fisher
Street or P.O. Box: Kerry County Council Buildings
City with postal code: Rathass, Tralee, Co. Kerry
Country: Ireland
Telephone: 066 7183500
E-mail: cathy.fisher@kerrycoco.ie
Web site: <http://www.kerrycoco.ie/en/>

10.2 Administering entity of the Core Area(s):

Name: NPWS Regional Manager
Street or P.O. Box: Killarney National Park
City with postal code: Muckross House, Killarney, Co. Kerry
Country: Ireland
Telephone: 064 6670144
E-mail: frances.o'sullivan@ahg.gov.ie
Web site: <http://www.killarneynationalpark.ie/>

10.3 Administering entity of the Buffer Zone(s):

Name: NPWS Regional Manager
Street or P.O. Box: Killarney National Park
City with postal code: Muckross House, Killarney, Co. Kerry
Country: Ireland
Telephone: 064 6670144
E-mail: frances.o'sullivan@ahg.gov.ie
Web site: <http://www.killarneynationalpark.ie/>

Name: Cathy Fisher
Street or P.O. Box: Kerry County Council Buildings
City with postal code: Rathass, Tralee, Co. Kerry
Country: Ireland
Telephone: 066 7183500
E-mail: cathy.fisher@kerrycoco.ie
Web site: <http://www.kerrycoco.ie/en/>

10.4. Administering entity of the Transition Area(s):

Name: NPWS Regional Manager
Street or P.O. Box: Killarney National Park
City with postal code: Muckross House, Killarney, Co. Kerry
Country: Ireland
Telephone: 064 6670144
E-mail: frances.o'sullivan@ahg.gov.ie
Web site: <http://www.killarneynationalpark.ie/>

Name: Cathy Fisher
Street or P.O. Box: Kerry County Council Buildings
City with postal code: Rathass, Tralee, Co. Kerry
Country: Ireland
Telephone: 066 7183500
E-mail: cathy.fisher@kerrycoco.ie
Web site: <http://www.kerrycoco.ie/en/>

MABnet Directory of UNESCO Biosphere Reserves

Administrative details

Country: Ireland

Name of BR: Kerry UNESCO Biosphere Reserve

Year designated: 1982

Administrative authorities: (7.6)

Name Contact: (10.1)

Contact address: (Including phone number, postal and email addresses) (10.1)

Related links: <http://www.killarneynationalpark.ie/>

Social networks: (6.5.4)

Description

General description:

Kerry is the most western county of Ireland and fourth largest in extent. The county is renowned as one of the most scenic areas in Ireland and as a significant tourist destination. Killarney town is the centre of the tourism industry in the county. It has attracted visitors for at least 250 years, making it the oldest and most famous tourist destination in Ireland. The main attraction for visitors to Killarney is Killarney National Park.

The UNESCO Biosphere Core Area encompasses the full extent of Killarney National Park and Eirk Bog Nature Reserve. Killarney National Park was the first national park in Ireland, first created when the Muckcross Estate was donated to the Irish State in 1932 and expanded through subsequent land acquisitions by the State. The park is an area of prime natural interest with a distinctive combination of mountains, lakes, woodlands and waterfalls. It is of particularly high ecological value because of the diversity, quality and extent of many of the habitats present. It includes the largest area of Ireland's remaining oak woodlands and the only sizeable yew woodland in Ireland. In addition, the last surviving herd of red deer are found within the park as well as an extensive list of rare species of flora and fauna.

Several important historical buildings and monuments also occur within the park, including Muckcross House, Muckcross Abbey, Ross Island and Castle, Inishfallen Abbey and Killarney House and Gardens. These features are maintained within the UNESCO Biosphere and are available to visitors. Traditional customs and culture are promoted within the UNESCO Biosphere through craft demonstrations and a working traditional farm. The Killarney National Park Education Centre fulfils an important educational role, providing a range of courses for primary, secondary and third level students and teachers, in addition to those provided to the general public.

The UNESCO Biosphere Buffer Zone and Transition Areas fall within areas of the MacGillycuddy's Reeks and Lough Leane catchment (Figure 1.3). These areas are not in State ownership but are linked hydrologically and ecologically to the Core Area. Therefore, sustainable land uses in these areas are important in supporting the integrity of the Core. There are many legislative and policy safeguards in place to ensure sustainable land use and development in these areas. In addition, there is a high level of stakeholder collaboration in place to ensure that the region is managed effectively but also meets the requirements of the local communities.

Killarney town lies immediately to the north of the Core Area within the Transition Area. The Core Area represents a critical input to the economic and social prosperity and development of Killarney Town and the wider hinterland. For this reason, development within Killarney town is undertaken with the remit to conserve and protect the Core Area for present and future generations in accordance with the principle of sustainable development. Likewise, UNESCO

Biosphere objectives will make every effort to facilitate the use of the Core Area for cultural, recreational, community and appropriate commercial use, as long as it complements the overriding priority to promote conservation.

The National Parks and Wildlife Service is responsible for the management and administration of the park. Long-term nature conservation is the primary objective of the park. However, the framework for governance of the Kerry UNESCO Biosphere Reserve comprises a partnership between Kerry County Council and National Parks and Wildlife Service.

Major ecosystem type: Maritime temperate deciduous forest

Major habitats & land cover types: Upland semi-natural vegetation, forested land, wetlands, waterbodies and lowland pastures

Bioclimatic zone: Meso-temperate

Location: 52.0445°N, 9.4703°W

Total Area : 65,760 ha.

Core Area(s): 10,370 ha

Buffer Zone(s): 24,010 ha

Transition Area(s): 31,380 ha

Different existing zonation: Existing zonation defines a Core Area (10,129 ha) & no defined buffer/transition areas.

Altitudinal range (metres above sea level): 17 – 1,038 m

Zonation map(s) (refer to section 2.2.2):

Main objectives of the UNESCO Biosphere reserve

Brief description

The expanded Kerry UNESCO Biosphere Reserve supports the following goals and objectives for the Core Area:

1. To fully reflect the obligations and goals of UNESCO Biosphere reserves as outlined in the Seville Strategy.
2. To fully reflect the objectives of the UN Convention on Biological Diversity.
3. To conserve, and where possible enhance, the ecological value of all natural and semi-natural habitats and features.
4. To conserve notable plant and animal species and to maintain their populations at adequate levels.
5. To conserve and where appropriate, restore and further develop the cultural and heritage features.
6. To encourage sustainable recreational and educational use, to provide information and facilities for visitors and to improve public awareness of its natural and cultural heritage.
7. To establish and continue effective liaison with all parties with an interest in the management of these areas and to maintain a good relationship with the local community.
8. To maintain the aesthetic and other qualities of the site.
9. To undertake or facilitate research necessary to achieve the above objectives and to monitor the effectiveness of conservation management.
10. To facilitate, promote and undertake scientific research within the UNESCO Biosphere Reserve.
11. To establish the Core Area as a "Biodiversity Reference Site".

The Buffer and Transition Areas will provide a support function to these goals and all activities within these areas will be compatible with the overall objectives and will serve to protect the Core Area of the UNESCO Biosphere Reserve.

It will be the responsibility of the Biosphere Management Council to ensure that the achievement of these goals is provided for in a defined management policy encompassing the entire area of the UNESCO Biosphere Reserve.

Research

Brief description

Main research themes include

1. Water quality and management
2. Plant and animal surveys
3. woodland ecology and management
4. A and grazing management

See Section 6 and Supporting Documents for further information.

Monitoring

Brief description

Monitoring activities are generally carried out by state bodies or third level institutions.

See Section 6 and Supporting Documents for further information.

Specific variables (fill in the table below and tick the relevant parameters)

Abiotic		Biodiversity	
Abiotic factors		Afforestation/Reforestation	
Acidic deposition/Atmospheric factors		Algae	
Air quality	X	Alien and/or invasive species	X
Air temperature	X	Amphibians	X
Climate, climatology		Arid and semi-arid systems	
Contaminants		Autoecology	
Drought		Beach/soft bottom systems	
Erosion	X	Benthos	
Geology		Biodiversity aspects	X
Geomorphology		Biogeography	X
Geophysics		Biology	X
Glaciology		Biotechnology	
Global change		Birds	X
Groundwater		Boreal forest systems	
Habitat issues	X	Breeding	
Heavy metals		Coastal/marine systems	
Hydrology		Community studies	X
Indicators		Conservation	X
Meteorology		Coral reefs	
Modeling		Degraded areas	
Monitoring/methodologies	X	Desertification	
Nutrients	X	Dune systems	
Physical oceanography		Ecology	X
Pollution, pollutants		Ecosystem assessment	X
Siltation/sedimentation		Ecosystem functioning/structure	
Soil		Ecosystem services	X

Abiotic		Biodiversity	
Speleology		Ecotones	X
Topography	X	Endemic species	
Toxicology		Ethology	
UV radiation		Evapotranspiration	
		Evolutionary studies/Palaeoecology	
		Fauna	X
		Fires/fire ecology	X
		Fishes	X
		Flora	X
		Forest systems	
		Freshwater systems	X
		Fungi	X
		Genetic resources	
		Genetically modified organisms	
		Home gardens	
		Indicators	
		Invertebrates	X
		Island systems/studies	
		Lagoon systems	
		Lichens	X
		Mammals	X
		Mangrove systems	
		Mediterranean type systems	
		Microorganisms	
		Migrating populations	X
		Modeling	
		Monitoring/methodologies	X
		Mountain and highland systems	X
		Natural and other resources	
		Natural medicinal products	
		Perturbations and resilience	
		Pests/Diseases	
		Phenology	
		Phytosociology/Succession	
		Plankton	
		Plants	X
		Polar systems	
		Pollination	
		Population genetics/dynamics	
		Productivity	
		Rare/Endangered species	X
		Reptiles	
		Restoration/Rehabilitation	X
		Species (re) introduction	X

Abiotic		Biodiversity	
		Species inventorying	X
		Sub-tropical and temperate rainforest systems	
		Taxonomy	
		Temperate forest systems	
		Temperate grassland systems	
		Tropical dry forest systems	
		Tropical grassland and savannah systems	
		Tropical humid forest systems	
		Tundra systems	
		Vegetation studies	X
		Volcanic/Geothermal systems	
		Wetland systems	X
		Wildlife	X

Abiotic		Biodiversity	
Agriculture/Other production systems	X	Biogeochemical studies	
Agroforestry		Carrying capacity	
Anthropological studies		Climate change	
Aquaculture		Conflict analysis/resolution	
Archaeology	X	Ecosystem approach	
Bioprospecting		Education and public awareness	X
Capacity building		Environmental changes	X
Cottage (home-based) industry	X	Geographic Information System (GIS)	X
Cultural aspects		Impact and risk studies	X
Demography	X	Indicators	
Economic studies	X	Indicators of environmental quality	X
Economically important species		Infrastructure development	X
Energy production systems		Institutional and legal aspects	
Ethnology/traditional practices/knowledge		Integrated studies	
Firewood cutting		Interdisciplinary studies	
Fishery	X	Land tenure	
Forestry	X	Land use/Land cover	X
Human health	X	Landscape inventorying/monitoring	
Human migration		Management issues	X
Hunting	X	Mapping	
Indicators		Modeling	
Indicators of sustainability		Monitoring/methodologies	
Indigenous people's issues		Planning and zoning measures	X
Industry	X	Policy issues	
Livelihood measures		Remote sensing	
Livestock and related impacts	X	Rural systems	X
Local participation		Sustainable development/use	X
Micro-credits		Transboundary issues/measures	
Mining		Urban systems	
Modeling		Watershed studies/monitoring	
Monitoring/methodologies			
Natural hazards			
Non-timber forest products			
Pastoralism	X		
People-Nature relations			
Poverty	X		
Quality economies/marketing			
Recreation	X		
Resource use			
Role of women	X		

Abiotic		Biodiversity	
Sacred sites	X		
Small business initiatives	X		
Social/Socio-economic aspects	X		
Stakeholders' interests	X		
Tourism	X		
Transports			

Annex III to the UNESCO Biosphere Reserve Periodic Review, January 2013

The Statutory Framework of the World Network of UNESCO Biosphere Reserves

Introduction

Within UNESCO's Man and the UNESCO Biosphere (MAB) programme, UNESCO Biosphere reserves are established to promote and demonstrate a balanced relationship between humans and the UNESCO Biosphere. UNESCO Biosphere reserves are designated by the International Co-ordinating Council of the MAB Programme, at the request of the State concerned. UNESCO Biosphere reserves, each of which remains under the sole sovereignty of the State where it is situated and thereby submitted to State legislation only, form a World Network in which participation by the States is voluntary.

The present Statutory Framework of the World Network of UNESCO Biosphere Reserves has been formulated with the objectives of enhancing the effectiveness of individual UNESCO Biosphere reserves and strengthening common understanding, communication and co-operation at regional and international levels.

This Statutory Framework is intended to contribute to the widespread recognition of UNESCO Biosphere reserves and to encourage and promote good working examples. The delisting procedure foreseen should be considered as an exception to this basically positive approach, and should be applied only after careful examination, paying due respect to the cultural and socio-economic situation of the country, and after consulting the government concerned.

The text provides for the designation, support and promotion of UNESCO Biosphere reserves, while taking account of the diversity of national and local situations. States are encouraged to elaborate and implement national criteria for UNESCO Biosphere reserves which take into account the special conditions of the State concerned.

Article 1 - Definition

UNESCO Biosphere reserves are areas of terrestrial and coastal/marine ecosystems or a combination thereof, which are internationally recognized within the framework of UNESCO's programme on Man and the UNESCO Biosphere (MAB), in accordance with the present Statutory Framework.

Article 2 - World Network of UNESCO Biosphere Reserves

1. UNESCO Biosphere reserves form a worldwide network, known as the World Network of UNESCO Biosphere Reserves, hereafter called the Network.
2. The Network constitutes a tool for the conservation of biological diversity and the sustainable use of its components, thus contributing to the objectives of the Convention on Biological Diversity and other pertinent conventions and instruments.
3. Individual UNESCO Biosphere reserves remain under the sovereign jurisdiction of the States where they are situated. Under the present Statutory Framework, States take the measures which they deem necessary according to their national legislation.

Article 3 - Functions

In combining the three functions below, UNESCO Biosphere reserves should strive to be sites of excellence to explore and demonstrate approaches to conservation and sustainable development on a regional scale:

(i) conservation - contribute to the conservation of landscapes, ecosystems, species and genetic variation;

(ii) development - foster economic and human development which is socio-culturally and ecologically sustainable;

(iii) logistic support - support for demonstration projects, environmental education and training, research and monitoring related to local, regional, national and global issues of conservation and sustainable development.

Article 4 - Criteria

General criteria for an area to be qualified for designation as a UNESCO Biosphere reserve:

1. It should encompass a mosaic of ecological systems representative of major biogeographic regions, including a gradation of human interventions.

2. It should be of significance for biological diversity conservation.

3. It should provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale.

4. It should have an appropriate size to serve the three functions of UNESCO Biosphere reserves, as set out in Article 3.

5. It should include these functions, through appropriate zonation, recognizing:

(a) a legally constituted Core Area or areas devoted to long-term protection, according to the conservation objectives of the UNESCO Biosphere reserve, and of sufficient size to meet these objectives;

(b) a Buffer Zone or zones clearly identified and surrounding or contiguous to the Core Area or areas, where only activities compatible with the conservation objectives can take place;

(c) an outer Transition Area where sustainable resource management practices are promoted and developed.

6. Organizational arrangements should be provided for the involvement and participation of a suitable range of inter alia public authorities, local communities and private interests in the design and carrying out the functions of a UNESCO Biosphere reserve.

7. In addition, provisions should be made for:

(a) mechanisms to manage human use and activities in the Buffer Zone or zones;

(b) a management policy or plan for the area as a UNESCO Biosphere reserve;

(c) a designated authority or mechanism to implement this policy or plan;

(d) programmes for research, monitoring, education and training.

Article 5 - Designation procedure

1. UNESCO Biosphere reserves are designated for inclusion in the Network by the International Coordinating Council (ICC) of the MAB programme in accordance with the following procedure:

(a) States, through National MAB Committees where appropriate, forward nominations with supporting documentation to the secretariat after having reviewed potential sites, taking into account the criteria as defined in Article 4;

(b) the secretariat verifies the content and supporting documentation: in the case of incomplete nomination, the secretariat requests the missing information from the nominating State;

(c) nominations will be considered by the Advisory Committee for UNESCO Biosphere Reserves for recommendation to ICC;

(d) ICC of the MAB programme takes a decision on nominations for designation. The Director-General of UNESCO notifies the State concerned of the decision of ICC.

2. States are encouraged to examine and improve the adequacy of any existing UNESCO Biosphere reserve, and to propose extension as appropriate, to enable it to function fully within the Network. Proposals for extension follow the same procedure as described above for new designations.

3. UNESCO Biosphere reserves which have been designated before the adoption of the present Statutory Framework are considered to be already part of the Network. The provisions of the Statutory Framework therefore apply to them.

Article 6 - Publicity

1. The designation of an area as a UNESCO Biosphere reserve should be given appropriate publicity by the State and authorities concerned, including commemorative plaques and dissemination of information material.

2. UNESCO Biosphere reserves within the Network, as well as the objectives, should be given appropriate and continuing promotion.

Article 7 - Participation in the Network

1. States participate in or facilitate co-operative activities of the Network, including scientific research and monitoring, at the global, regional and sub-regional levels.

2. The appropriate authorities should make available the results of research, associated publications and other data, taking into account intellectual property rights, in order to ensure the proper functioning of the Network and maximize the benefits from information exchanges.

3. States and appropriate authorities should promote environmental education and training, as well as the development of human resources, in co-operation with other UNESCO Biosphere reserves in the Network.

Article 8 - Regional and thematic subnetworks

States should encourage the constitution and co-operative operation of regional and/or thematic subnetworks of UNESCO Biosphere reserves, and promote development of information exchanges, including electronic information, within the framework of these subnetworks.

Article 9 - Periodic review

1. The status of each UNESCO Biosphere reserve should be subject to a periodic review every ten years, based on a report prepared by the concerned authority, on the basis of the criteria of Article 4, and forwarded to the secretariat by the State concerned.

2. The report will be considered by the Advisory Committee for UNESCO Biosphere Reserves for recommendation to ICC.

3. ICC will examine the periodic reports from States concerned.

4. If ICC considers that the status or management of the UNESCO Biosphere reserve is satisfactory, or has improved since designation or the last review, this will be formally recognized by ICC.
5. If ICC considers that the UNESCO Biosphere reserve no longer satisfies the criteria contained in Article 4, it may recommend that the State concerned take measures to ensure conformity with the provisions of Article 4, taking into account the cultural and socio-economic context of the State concerned. ICC indicates to the secretariat actions that it should take to assist the State concerned in the implementation of such measures.
6. Should ICC find that the UNESCO Biosphere reserve in question still does not satisfy the criteria contained in Article 4, within a reasonable period, the area will no longer be referred to as a UNESCO Biosphere reserve which is part of the Network.
7. The Director-General of UNESCO notifies the State concerned of the decision of ICC.
8. Should a State wish to remove a UNESCO Biosphere reserve under its jurisdiction from the Network, it notifies the secretariat. This notification shall be transmitted to ICC for information. The area will then no longer be referred to as a UNESCO Biosphere reserve which is part of the Network.

Article 10 - Secretariat

1. UNESCO shall act as the secretariat of the Network and be responsible for its functioning and promotion. The secretariat shall facilitate communication and interaction among individual UNESCO Biosphere reserves and among experts. UNESCO shall also develop and maintain a worldwide accessible information system on UNESCO Biosphere reserves, to be linked to other relevant initiatives.
2. In order to reinforce individual UNESCO Biosphere reserves and the functioning of the Network and sub-networks, UNESCO shall seek financial support from bilateral and multilateral sources.
3. The list of UNESCO Biosphere reserves forming part of the Network, their objectives and descriptive details, shall be updated, published and distributed by the secretariat periodically.