ENDORSEMENT

UNESCO World Biosphere Regions are places that have been acknowledged as special places for nature and for people – and where there is a healthy balance between the two. We could be the first entire country to be nominated as a UNESCO Biosphere Region which makes this an exciting opportunity to show how we balance a vibrant community, healthy environment and thriving economy.

We and our teams have been closely involved in the application and it has been particularly pleasing to witness the considerable cross community interest and engagement in the process. It is important that we support this community involvement to ensure that our island continues to be a unique, beautiful and successful place to live, work and visit.

Isle of Man Government
Reiltys Ellan Vannin

Hon. A R Bell MHK
Chief Minister

Hon. R A Ronan MHK,
Minister for Environment, Food and Agriculture

Hon. P A Gawne MHK
Minister for Infrastructure

Hon. L D Skelly MHK
Minister for Economic Development

Hon. T M Crookall MHK
Minister for Education and Children

Tony Pass
Chairman, Manx Museum and National Trust

Key Non-Governmental Partners

Culture VANNIN

Breesha Maddrell, Director
Culture Vannin

Manx Wildlife Trust

Duncan Bridges, Director
Manx Wildlife Trust

ecovannin
Isle of Man for future generations

Muriel Garland, Chairperson
EcoVannin

Manx NFU

Ray Craine, MNFU Patron
Manx National Farmers Union

Manx Fish Producers Organisation Limited

David Beard, Chief Executive
Manx Fish Producers Organisation

Mr Councillor David Christian, MBE, JP, Leader of the Council
Douglas Borough Council

United Nations Educational, Scientific and Cultural Organization

Man and the Biosphere Programme

BIOSPHERE RESERVE

NOMINATION FORM

[January 2013 template]

INTRODUCTION

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 Biosphere (MAB) They are established to promote and demonstrate a balanced relationship between humans and the biosphere*. Biosphere reserves are designated by the International Coordinating Council of the MAB Programme at the request of the State concerned. Individual biosphere reserves remain under the sovereign jurisdiction of the State where they are situated. Collectively, all biosphere reserves form a World Network in which participation by States is voluntary.*

The World Network is governed by the Statutory Framework adopted by the UNESCO General Conference in 1995 which presents the definition, objectives, criteria and the designation procedure for biosphere reserves. The actions recommended for the implementation of biosphere reserves are set out in the "Seville Strategy" and were further developed in the Madrid Action Plan (2008-2013). These documents should be used as basic references for the completion of this nomination form.

The information presented on this nomination form will be used in a number of ways by UNESCO:

- *(a) For examination of the site by the International Advisory Committee for Biosphere Reserves and by the Bureau of the MAB International Coordinating Council;*
- *(b) For use in a world-wide accessible information system, notably the UNESCO-MABnet and publications, facilitating communications and interaction amongst persons interested in biosphere reserves throughout the world.*

The nomination form consists of three parts:
Part one is a summary indicating how the nominated area responds to the functions and criteria for biosphere reserves set out in the Statutory Framework, and presents the signatures of endorsements for the nomination from the authorities concerned. Part two is more descriptive and detailed, referring to the human, physical and biological characteristics as well as to the institutional aspects. Part three consists of two annexes: the first annex will be used to update the Directory of Biosphere Reserves on the MABnet, once the site has been approved as a biosphere reserve. The second annex will be used to provide promotional and communication materials of the biosphere reserve. Tables, illustrations and maps as appropriate throughout the nomination form are welcomed.

The form should be completed in English, French or Spanish. Two copies should be sent to the Secretariat, as follows:

1. *The original hard copy, with the original signatures, letters of endorsement, zonation map and supporting documents. This should be sent to the Secretariat through the Official UNESCO channels, i.e. via the National Commission for UNESCO and/or the Permanent Delegation to UNESCO;*
2. *An electronic version (on diskette, CD, etc.) of the nomination forms and of maps (especially the zonation map). This can be sent directly to the MAB Secretariat:*

UNESCO
Division of Ecological and Earth Sciences
1, rue Miollis
F-75352 Paris Cedex 15, France
Tel: +33 (0)1 45 68 41 51
Fax: +33 (0)1 45 68 58 04
Email: mab@unesco.org
http://www.unesco.org/mab

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PART I: SUMMARY

The 'UNESCO Biosphere Isle of Man' covers the 572 sq. km land area of the Isle of Man and the Manx Territorial Sea comprising a further 3,998 sq. km, a total of 4,570 sq. km. This proposed Biosphere Reserve will embrace the goals of the 1995 Seville Strategy and Statutory Framework for the World Network of Biosphere Reserves by fully involving local communities and promoting sustainable development.

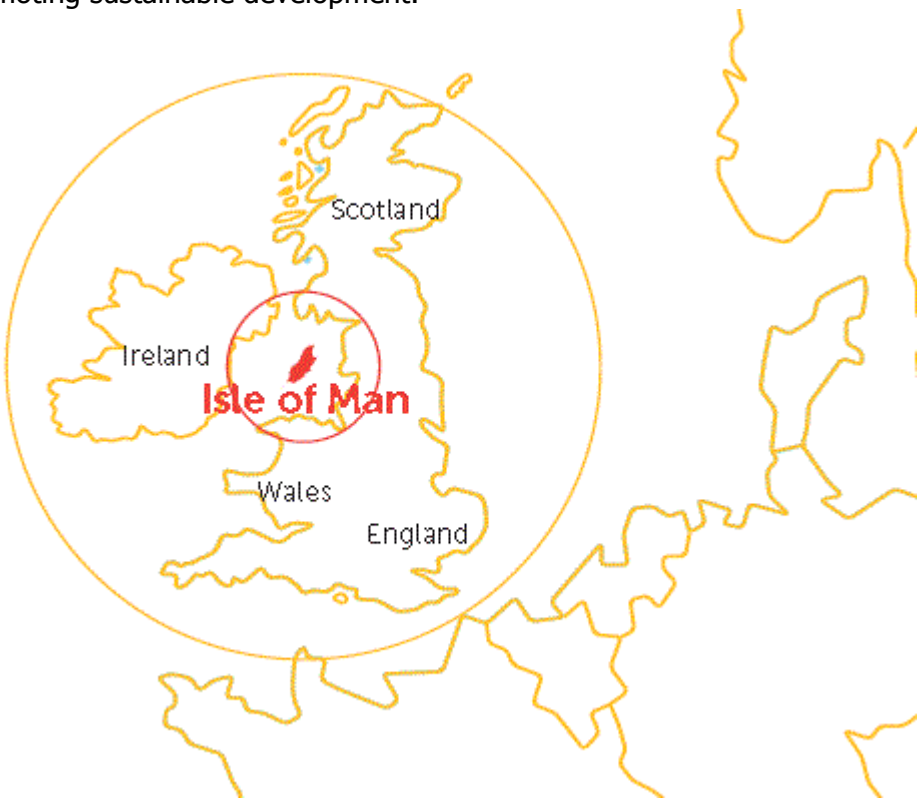


Figure 1: Location of the Isle of Man in the British Isles

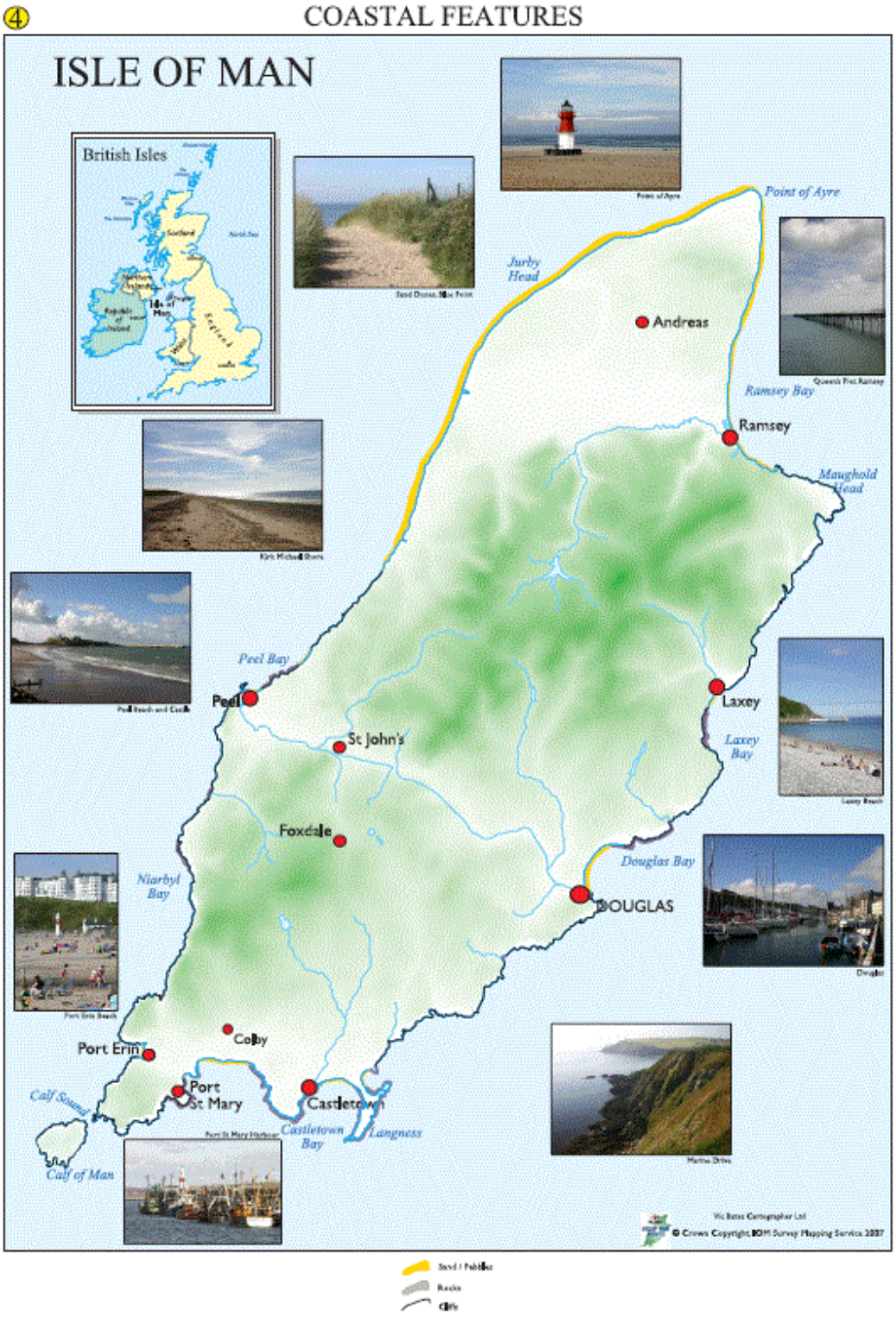


Fig 2: Isle of Man: main population areas and coastal features

The entire population of the Island, some 84,500 residents (2011 census), live within the terrestrial Buffer and Transition Zones.

The Island's ambition is that UNESCO Biosphere Isle of Man will recognise the Isle of Man as a special place for people and for nature. It will provide the Isle of Man with a unique opportunity to show how the high-quality environment, vibrant community and thriving economy complement and reinforce each other. The Island will be first entire jurisdiction, covering both land and sea territory, to become a UNESCO Biosphere Reserve.

The proposed Biosphere Reserve is a geographically and culturally coherent area. The country is a Crown Dependency (self-governing dependent territory of the British Crown), but is not part of the United Kingdom of Great Britain and Northern Ireland (UK), with the exception of Defence and International Relation matters.

The Isle of Man has had various Multilateral Environmental Agreements, including the Convention on Biological Diversity, extended to it by the UK at the Island's request (see Section 2 for full list). Presently, the Wildlife Act (1990) is the main means of delivering statutory biodiversity conservation, although there are strong and ambitious non-government activities in biodiversity conservation, restoration and management. The Island's Strategic Plan "Towards a Sustainable Island" spells out the terrestrial planning policies and recognises the role of biodiversity as important for planning decisions.

The Island is increasingly recognised internationally for the innovative sustainable management measures introduced for its territorial waters.

Culture

The Isle of Man is characterised by its own language, its own parliament and legislative body, and historical Celtic and Norse influences as a consequence of its strategic location in the centre of the Irish Sea. There has been human habitation here for much of the 10,000 years since the last Ice Age. Through the ages, Islanders have developed a strong farming and maritime tradition, building community resilience through sustainable practice.

Although spoken by only a minority of Isle of Man residents (English is the normal "business" language of the Island) the use of the Manx language (Manx) is supported by the Isle of Man Government and it has protection under Part II of the Council of Europe's European Charter for Regional or Minority Languages.

The proceedings of the Island's parliament, Tynwald, are in English. However, a significant number of the Members of Tynwald now use customary terms or sentences in Manx Gaelic during proceedings.

Terrestrial and aquatic ecosystems

The highest point is Snaefell at 621m above sea level. Of the 120km of coastline, the northern coast is sand and shingle with dunes and soft sand clay and gravel cliffs, while the southern coastline has rocky cliffs and beaches with the occasional sandy bay. There are two upland masses divided by a central valley; these uplands make up about a quarter of the land area. The longest river is the Sulby, which forms a small saltmarsh and estuary at Ramsey. at the foot of the northern hills on the northern plain lies the largest wetland - Ballaugh Curragh (curragh means willow marsh or Carr, in Manx). This varied topography allows for a wide diversity of ecosystems.

Ecosystems of significance in the British or European context are protected by a number of legal and management systems and make up the Core areas of the Biosphere Reserve.

Marine habitats

The majority of the rocky coast is made up of Manx slates, with small outcrops of limestone and sandstone. There are many rocky coves, some with sand or shingle beaches. The northern shore is mainly shingle and gravel. The best rocky coast for lobster (*Homarus gammarus*) and crab potting (*Cancer pagerus*) and recreational diving is popular around the south. There are sea caves in the limestone and tidal caves in the Manx slate. The seabed varies, with wide areas of loose stones and gravels, where most of the king scallops (*Pecten maximus)* and queen scallops (*Aequipecten opercularis*) are caught, and three distinct sand banks extending from the Point of Ayre: the Bahama Bank, the Ballacash Bank and King William's Bank. The sea is deepest to the west of the island and here the seabed is muddy and suitable for Dublin Bay Prawns (*Nephrops norvegicus).* Maerl deposits and eel grass (*Zostera marina*) beds, up to the horse mussel (*Modiolus modiolus*) reef off the point of Ayre, are important parts of the Ramsey Bay Marine Nature Reserve. Horse mussel reef also occurs intermittently down the east coast.

The marine Core Areas include the Marine Nature Reserve and the five fisheries management areas. Additional Marine Protected Areas are currently under consideration. The marine Buffer Zone covers the rest of the 0-3 mile zone.

Land use

The Island shows abundant evidence of past land use, with early settlements and exploitation of its various natural resources from prehistoric times until the present. The earliest traces of people on the Isle of Man date back to the

Mesolithic Period (10,000 years BP). In recent history, livestock farming (sheep on the hills, cattle and sheep in the valleys) was the primary agricultural practice in the Island. Evolving agriculture has led to the development of the distinct character of the landscape, which is seen today; particularly the small fields which date back to the Viking Quarterland farm boundaries.

Mineral extraction dates back to the Bronze Age, but the mining of metal ores peaked in the late 19th Century when, for some years, Manx mines were equal to the biggest lead and zinc mines anywhere in Britain. Altogether, there were well over 100 mines and mine-trials scattered throughout the Island, which remain strong features of the landscape.

Land Use Planning

Enabling development to occur in accordance with the principles of sustainability is part of the overarching aim of the Isle of Man Strategic Plan. The Island Spatial Development Strategy sets out the overall direction of future development on the Island. This strategy recognises that, in order to grow sustainably, the Island needs to focus the majority of development within and adjacent to existing settlements. This makes the best use of existing infrastructure and services, reduces dependence on private cars and limits the amount of greenfield land required for development. Allocations for future development sites are based on this overarching principle.

A "marine consenting regime" is currently being finalised to ensure potential offshore developments are planned and constructed to standards stipulated in relevant international protocols.

Tourism

In the late 19th century, the Island became an extremely popular tourist destination. Visitors came in huge numbers to the Island, leading to significant expansion of coastal settlements, and the development of hotels and boarding houses. Figures peaked just before World War One, when 660,000 visited in 1913, compared to a census population at the time of 52,000.

Economy

The most recent evolution of the Manx economy came in the late 1980s. The development of financial services and manufacturing sectors has resulted in a remarkably robust and diverse economy, and more than 30 years of unbroken economic growth. Having been displaced as predominant elements of the economy, the Manx Government is currently working with the agriculture and tourism sectors to encourage numerous initiatives to attract more visitors and create new markets.

Plans

The Isle of Man Government, as lead partner for Biosphere Isle of Man, has an 'Agenda for Change.' This stresses the need to "use our natural resources sustainably and ensure we respond to the global challenges, responsibilities and opportunities which food security, energy security and climate change present".

Biosphere reserve status for the Isle of Man will further enhance community awareness of the value and importance of its unique environment and vibrant culture. Through a combination of innovation, education in schools, and business and community initiatives, the Manx government and civil society will strive to achieve the right balance between conservation and development to ensure a sustainable future for our Island.

Biosphere reserve status for the Isle of Man will also engender a stronger sense of community engagement and pride in the local environment, through more environmental education, hands-on experience and practical volunteering opportunities. It is often commented that, for the size of the population, that there is a dis-proportionate number and range of activities with volunteer support – and such volunteerism will flow to management contributions to the Biosphere Reserve. Further links between local learning institutions and environmental managers will be developed, as well as making new connections with UK MAB, EuroMAB and the World Network of Biosphere Reserves. A *Biosphere Partnership* is working to realise these potential benefits by seeking "win-win" solutions for people and nature to help ensure future development becomes more sustainable, and the community retains its vibrant nature.

While anticipating the changes foreseen in the draft Plan for 2016-2025, this Biosphere Reserve proposal recognises especially the importance of the targets of the UNESCO MAB Madrid Action Plan 2008-13, in particular through the following activities:

- Local communication and public engagement work through a wide range of stakeholders (Target 6: Communication strategies integrated);
- Innovative work to further sustainable development both on-island and through international work (Target 8: Linkages with sustainable development initiatives)
- Broad and inclusive partnership process, including Facilitated Workshop to progress zonation (Target 10: Participatory processes);
- Zonation to cover wide range of terrestrial and marine areas with gradation in human interventions, in small geographic area (Target 13: Functional Zonation, particularly with regard to buffer and transition zones and define performance standards for each zone);

- Connectivity between elements in the landscape, (Target 14: ecosystem corridors along rivers, roads and paths recognised by planners);
- Continue applied research through the relevant research faculties and other learning institutions on the Island (Centre for Manx Studies, Culture Vannin and Department of Education) and continued links with other educational institutions such as Solway Centre in SW Scotland (part of Glasgow University) and Bangor University for marine research (Target 16: Site-based policy-relevant research programmes);
- Continue studies of ecosystem services (Target 19: Research programmes on ecosystem services and management);
- Develop relationships with local research bodies to support management and environmental improvement (Target 20: applied research programmes linked to management);
- Promote the BR as a learning site of excellence for sustainable development, in the context of UN Decade of Education for Sustainable Development (DESD), number of schools involved (Target 21: DESD Activity within schools) ;
- Develop economic contribution of BR's to local economy, through sustainable production, harvesting, and marketing of BR products (Target 26: Improved generation of profits and livelihoods from sustainable Biosphere Reserve products using the BR brand) ;
- Develop work with the private sector (Target 27: Increased private sector involvement) ;
- Investigate World Network of Biosphere Reserve links to BRs in countries where Isle of Man International Development Committee are assisting with sustainable development goal-related projects (Target 28 and 29: Exchanges and Partnerships between Biosphere Reserves).

1. **PROPOSED NAME OF THE BIOSPHERE RESERVE:**
[It is advisable to use a locally accepted geographic, descriptive or symbolic name which allows people to identify themselves with the site concerned (e.g. Rio Platano Biosphere Reserve, Bookmark Biosphere Reserve). Except in unusual circumstances, biosphere reserves should not be named after existing national parks or similar administrative areas.]

UNESCO Biosphere Isle of Man

2. NAME OF THE COUNTRY: Isle of Man (through UK Government for International Relations).

The Isle of Man is not part of the United Kingdom, nor is it part of the European Union. It is not represented at the UK or European Parliaments. The Island is a self-governing British Crown Dependency with its own government, laws and parliament (called Tynwald). The UK Government, on behalf of the Crown, is ultimately responsible for the Island's defence, international relations and good government. Her Majesty the Queen, who is 'Lord of Mann', is the Manx Head of State and is personally represented in the Island by the Lieutenant Governor. Appointed by the Sovereign, on the advice of the UK Lord Chancellor and Secretary of State for Justice, with the concurrence of the Government of the Isle of Man, the Lieutenant Governor serves for a five-year term. The Manx Government enjoys a very positive working relationship with the UK Ministry of Justice, the responsible Ministry for the UK Government's relationship with the Isle of Man.

Tynwald was founded more than 1,000 years ago and is believed to be the oldest continuous parliament in the world. Tynwald has two chambers – the House of Keys, with 24 members (MHKs) elected at general elections every five years, and the Legislative Council (the Upper House). A Bill that has been passed by both Branches of Tynwald must be granted Royal Assent from, or on behalf of, the Crown before it becomes an Act of Tynwald.

The Island has a special but limited relationship with the EU, under an agreement ('Protocol 3') negotiated when the UK joined the, then, European Economic Community in 1973, allowing free trade in agricultural and manufactured products between the Isle of Man and EU members. Apart from matters relating to this agreement, including Customs, the Island is not directly bound by EU laws and it pays nothing to, and receives nothing from, EU funds. This limited relationship allows the free trade of agricultural and manufactured products across the EU. It is part of the EU Common Customs Area and Common Travel Area so does not have a Border Inspection Post.

Multilateral Environmental Agreements[1] are extended to the Isle of Man by the UK which is the contracting party. These include:

- UN Convention on Biological Diversity.
- UN Convention on the Conservation of Migratory Species of Wild Animals, including the following regional agreements:
    - Agreement on the conservation of African-Eurasian Migratory Waterbirds
    - Agreement on the Conservation of Bats in Europe (EUROBATS)
    - Agreement on the Conservation of Petrels and Albatrosses
    - Agreement on the Conservation of Small Cetaceans (ASCOBANS) – under discussion.
    - Memorandum of Understanding on the Conservation of Migratory Sharks
    - Memorandum of Understanding on the Conservation of Raptors
- CITES - Convention on International Trade in Endangered Species of Fauna and Flora.
- International Convention on the Regulation of Whaling.
- Convention on Wetlands of International Importance (Ramsar. 1971).
- UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage
- Bern Convention on the Conservation of European Wildlife and Natural Habitats.
- OSPAR Convention for the Protection of the Marine Environment (arising from Oslo and Paris Conventions on hazardous substances in the marine environment). NE Atlantic is now included. Including Annex V on protection and conservation of marine biodiversity and ecosystems.
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal – for transfer of wastes to the UK for the appropriate treatment where Isle of Man does not have facilities.
- Convention on Environmental Impact Assessment in a Transboundary Context.
- Convention on Long-Range Transboundary Air Pollution.
- International Convention for the Prevention of Pollution from Ships.

[1] In addition to EU customs legislation which applies directly to the Island, EU provisions in the following fields - veterinary legislation; animal health legislation; plant health legislation; marketing of seeds and seedlings; food legislation; feedingstuffs legislation; and quality and marketing standards - applies to the Island under the same conditions as in the United Kingdom to agricultural products imported into the Island or exported from the Island to the EU.

- London Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter.
- United Nations Framework Convention on Climate Change – Kyoto Protocol on greenhouse gas emissions.
- Vienna Convention for the Protection of the Ozone Layer – Montreal Protocol on Substances that Deplete the Ozone Layer.

3. FULFILLMENT OF THE THREE FUNCTIONS OF BIOSPHERE RESERVES:

[Article 3 of the Statutory Framework presents the three functions of conservation, development and logistic support. Explain in general terms how the area fulfils these functions.]

The Isle of Man is conscious that Biosphere Reserves are sites established by countries and recognized under UNESCO's Man and the Biosphere (MAB) Programme to promote sustainable development based on local community efforts and sound science.
As places that seek to reconcile conservation of biological and cultural diversity and economic and social development through partnerships between people and nature, they are ideal to test and demonstrate innovative approaches to sustainable development from local to international scales. (ref. www.biospheresmart.org)

3.1 "Conservation - contribute to the conservation of landscapes, ecosystems, species and genetic variation".

(Stress the importance of the site for conservation of biological and cultural diversity at the regional or global scales).

The Isle of Man is able to contribute positively to the objectives of UNESCO's Man and the Biosphere Programme as a consequence of its unique combination of self-governing status and geographical location in the Irish Sea. Its land and territorial waters are host to a wide range of distinctive landscapes and component ecosystems, a rich cultural heritage, and communities that care about their environment and island identity.

Conservation of biological diversity

As a self-governing Crown Dependency, the Isle of Man has the authority to introduce primary and secondary legislation for the purposes of nature conservation and marine/ land use planning. Accordingly, The Island's Government employs Biodiversity and Environmental Protection Officers who work in conjunction with land owners and non-government organisations to provide effective conservation management.

Nature conservation takes place through:

1. the Island's Wildlife Act 1990 which covers:

a) site protection,
b) species protection,
2. Government ownership,
3. non-statutory conservation activities of voluntary organisations, and
4. research and collaboration.

The Wildlife Act facilitates the meeting of responsibilities under other Multilateral Environmental Agreements listed in section 2. Additionally, the farming and fishing practices have resulted in a rich matrix of land and sea uses, all of which contribute to the Island's biodiversity.

A Conservation Forum, with representation from all conservation and countryside groups, was established in 2009. This group consider the future challenges for Manx biodiversity, including the impacts of our changing climate. The Forum meets and discusses matters of common interest, providing a formal route for communication between the Department and voluntary groups and a place for discussion between those groups.

Statutory site protection

Under the Wildlife Act 1990 the following may be designated:

- Area of Special Scientific Interest (ASSI)
- National Nature Reserve (NNR)
- Marine Nature Reserve (MNR)
- Area of Special Protection (ASP)

There are 21 ASSIs (2014). Should more be designated, they will become incorporated as core areas within the biosphere reserve.

The Ballaugh Curragh is an Area of Special Scientific Interest (ASSI) and a Ramsar Wetland of International Importance. (See Section 18)

The Calf, off the south-west point of the Isle of Man, under the ownership of Manx National Heritage, has been a Bird Observatory since the 1962. A rat eradication program has been carried out (2013/14) to protect the breeding population of Manx Shearwater (*Puffinus puffinus*). This species, commonly named after the Manx population, has suffered a decline due to predation but already there are signs that their numbers are recovering.

An Area of Special Protection for Birds was designated at the Ayres Gravel Pit (Bride) in 2001. It is an important site for migratory wildfowl and waders as well as some breeding species. The NGO Manx Birdlife is planning to develop a bird hide and visitor facilities there.

One Marine Nature Reserve has been designated. Ramsey Bay Marine Nature Reserve (MNR), established in 2011, covers nearly 95 km^2 including horse mussel (*Modiolus modiolus*) reef, maerl (*Lithothamnion corallioides*), and

eelgrass (*Zostera marina*) beds. The MNR was established with the full support of local fishermen, as this reserve is also expected to conserve shellfish stocks.[2] See 14.1.1 Marine and section 18.

Appendix 1 shows the range of marine and terrestrial ecosystems under protective designations, along with their Statutory Powers.

Invasive species

There are a number of non-native plant and animal species which are considered invasive. These are listed in schedule 8 to the Wildlife Act. Himalayan balsam (*Impatiens glandulifera)* and giant hogweed (*Heracleum mantegazzianum)* grow by rivers. Some species such as Japanese Knotweed (*Fallopia japonica)* and *Sargassum muticum* seaweed are spreading rapidly of their own accord. Japanese Knotweed is recognised as a serious threat to waterside ecosystems within the Isle of Man. Others are listed regionally or internationally as invasive, but have not yet shown indications of being any invasive tendencies on the Isle of Man.

Despite introductions, an additional natural level of biosecurity comes from being an island. For example, there has been no record of Foot and Mouth disease in the last 60 years; bees have been recognised as having *Varroa* free status, and the UK's Rare Breeds Survival Trust uses the remote nature of the Island to contribute to the conservation of the rarest breeds of British farm animals. The Isle of Man is one of only two OIE-approved disease free zones in the world (OIE is the world organisation for animal health, www.oie.int) and very relevant for the export of high health status eyed salmonid eggs.

Government ownership

The Government's Department of Environment Food and Agriculture manages most of the island's Glens. These glens have broadleaved woodland cover developed in steep valleys since planting in the Victorian era. Throughout these Glens, much of the original bryophyte and lichen flora, and some ground flora have survived. The bryophyte and lichen is a unique high Atlantic flora especially and flourishes especially as a result of being under tree cover. Seventeen of the glens are now regarded as the "Manx National Glens", owned or leased by the Department of Environment Food and Agriculture.

Other areas are protected under the Manx Museum and National Trust Act and managed by Manx National Heritage, including the rural life farm of Cregneash, upland and coast at Eary Cushlin and Maughold Brooghs.

[2] For more information about current marine conservation in Manx waters see: http://www.gov.im/media/983607/3.7_conservation.pdf

Non-statutory conservation activities and voluntary organisations
The NGO Manx Wildlife Trust (MWT) has 22 nature reserves covering a wide range of ecosystems. These reserves provide non-statutory protection for important sites. The Trust's Close Sartfield Reserve, with its species-rich orchid hay meadows, is part of Ballaugh Curragh ASSI, and its Cronk y Bing nature reserve is also an ASSI. These reserves are recognised through the planning system and noted in the Island Strategic Plan. MWT manages two visitor centres at either end of the island, on the Ayres and at Scarlett.

Manx BirdLife works to develop bird conservation on the island. A detailed atlas of breeding and visiting birds was published in 2007 and a wildlife film produced. The breeding bird survey is repeated each year to re-survey the whole island by 2016, in order to identify population trends.

There are more than 20 other voluntary organisations dedicated to conservation (e.g. Manx Basking Shark Watch, Manx Butterfly Conservation, Isle of Man Fungus Group), or which promote conservation activities (Isle of Man Natural History and Antiquarian Society and the Society for the Preservation of the Manx Countryside and Environment).

The Manx community are actively involved in marine conservation and research. DEFA are the lead department on marine conservation issues and work in collaboration with a wide range of Manx NGO's and other international partners.

A Biological Recording Partnership of 14 organisations brings together different biological data sets to ensure this information is available widely for the purpose of managing and conserving biodiversity. The data sets also form part of the UK National Biodiversity Network (NBN), itself part of the Global Biodiversity Information Facility (GBIF).

Research and collaboration
The Isle of Man Government has an active fisheries research and management programme, working in collaboration with the fishing industry and fisheries scientists from Bangor University in Wales. The Fisheries Act 2012 covers marine and freshwater fisheries and is compliant with the EU Common Fisheries Policy. The Government has a fisheries protection vessel *Barrule* and a team of fisheries enforcement officers. The Government also works with the Manx fishing industry to introduce innovative approaches to fisheries management.[3]

Landscape and geology

[3] For more information about Manx fisheries management see: http://www.gov.im/media/983619/4.1_fisheries.pdf

Geologically important areas have been protected as part of biological ASSIs (Langness, Derbyhaven and Sandwick ASSI and Pooil Vaaish ASSI) although the Wildlife Act does also allow for physiographical sites with physiographic features of interest to be designated. The Island is well-endowed with coastal exposures, many of which are accessible and important for education, public amenity and scientific research.

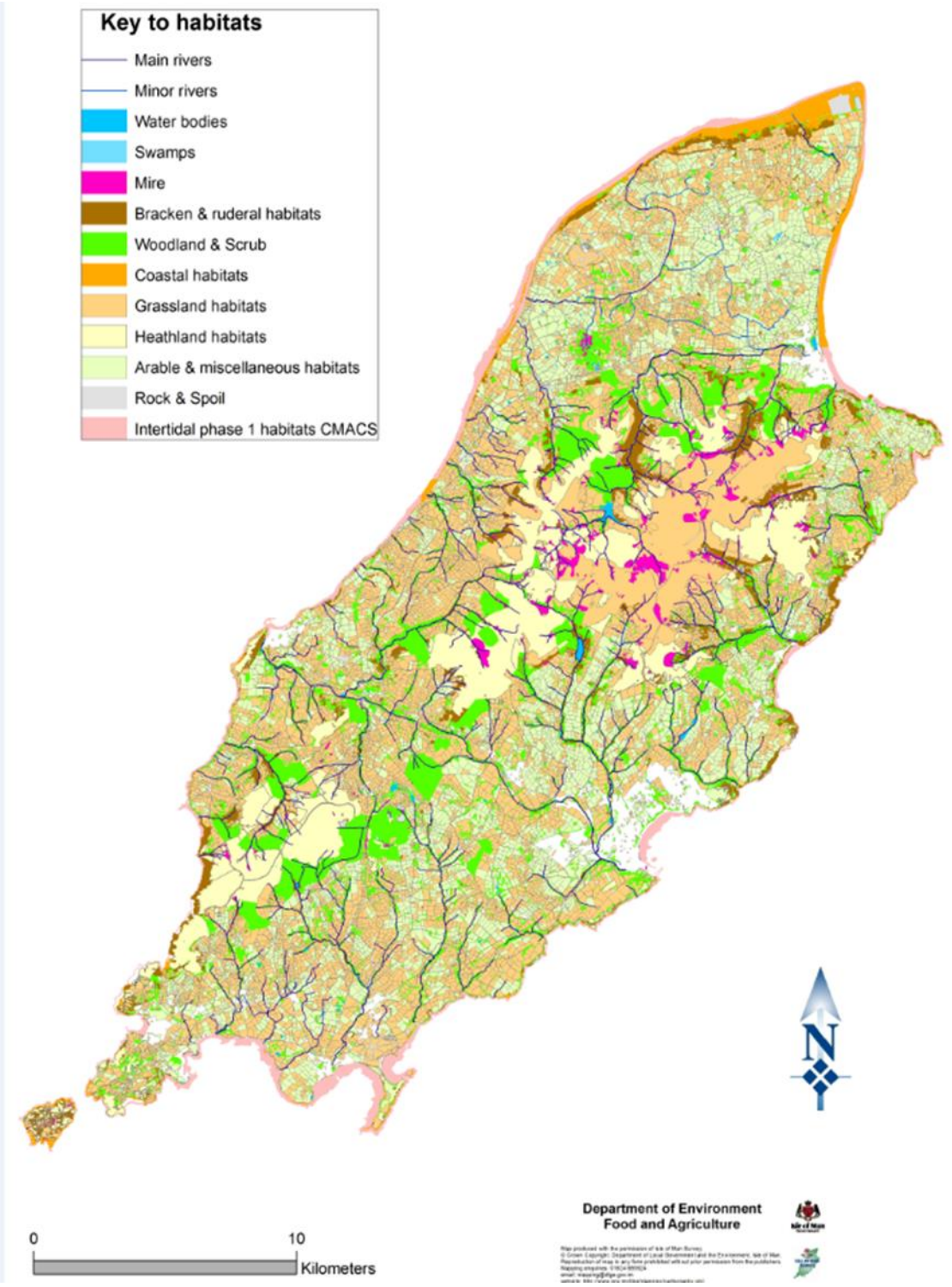


Figure 3 Terrestrial Ecosystem/Habitat Types

Conservation of cultural diversity

Cultural heritage is protected and promoted by various bodies, most notably by Manx National Heritage and Culture Vannin. The flag of the Isle of Man is composed of a triskele of three legs against a red background, with the motto " *Whichsoever way you throw it, it will stand"* (*Quocunque jeceris stabit*). This is an expression of Manx resilience symbolising the adaptability of the Manx people to changes in circumstances. The Isle of Man also has its own tradition of Manx music and dance.

The Isle of Man has its own language, Manx Gaelic, a member of the Celtic group of the Indo-European family of languages. The latest systematic data on knowledge of Manx Gaelic is based on information provided for the 2011 Census. A total of 1,823 people (of the resident population of 84,497) claimed to read, speak or write Manx Gaelic, with 1,662 people being able to speak the language. This is an increase of 135 people since the 2001 Census. The key element in the Census question was fluency. Persons only knowing a few words or phrases (a larger minority >82,000 Island residents) ticked the box marked, "No, cannot speak, read or write Manx Gaelic".

It is a requirement under the Island's legislation for the Department of Education and Children (DEC) to make provision in the curriculum, for all registered pupils of compulsory school age at schools provided and maintained by the Department, to include the teaching of Manx Gaelic and the culture and history of the Island.

There is also a Manx language primary school, the Bunscoill Ghaelgagh, which, as of September 2014, had 71 children attending it. Children at this primary school receive nearly all of their education in the Manx language. Children who have attended the school have the opportunity to receive some of their secondary education through the language at one of the Island's five public secondary schools. The playgroup organisation, Mooinjer Veggey, which operates the Bunscoill Ghaelgagh on behalf of the DEC, also runs a series of preschool groups for children that introduce the Manx language to children.

Manx Gaelic is taught as an optional second language at all of the Island's primary and secondary schools. The lessons are provided by the DEC's Manx Language Team who teach up to A Level standard. At present, roughly 1000 children receive some Manx Language provision each year. The first native speakers of Manx (bilingual with English) in many years have now appeared: children brought up by Manx-speaking parents.

The use of Manx is supported by the Isle of Man Government and has protection under Part II of the Council of Europe's European Charter for Regional or Minority Languages. The proceedings of the Island's parliament, Tynwald, are in English. However, a significant number of the Members of Tynwald now use customary terms or sentences in Manx Gaelic during proceedings.

Manx Radio, which is partly government-funded, provides some programming in and about Manx Gaelic, with assistance from the Gaelic Broadcasting Committee (a body overseen by the Isle of Man Government's Communications Commission). This Committee presents an annual report of its activities to Tynwald. Currently, five programmes a week are broadcast wholly or partly in Manx by Manx Radio. In addition, the news in Manx is available on the Manx Radio website. A local newspaper, the Isle of Man Examiner, has a monthly bilingual column in the language.

Culture Vannin supports the publication of new written material in Manx. For example, the children's Gruffalo stories were published in Manx. Culture Vannin has an integrated social media presence, including the www.learnmanx.com website; a YouTube channel (www.youtube.com/gaelg) and a twitter feed (www.twitter.com/greinneyder).

3.2 "Development - foster economic and human development which is socio-culturally and ecologically sustainable".

(Indicate current activities and the potential of the proposed biosphere reserve in fulfilling the objective of fostering sustainable economic and socio-cultural development, including by securing flows of ecosystem services from the biosphere reserve).

Many of today's coastal towns and villages have grown from fishing ports which also acted as essential trade links to neighbouring countries. During the Industrial Revolution, plentiful stocks of white fish, such as herring *(Clupea harengus),* caught in the surrounding seas by large fleets of traditional sail-powered trawlers, were landed on the Island, processed, shipped via ferry and sold on the market in Liverpool on the same day.

With engine power replacing sail power and no overarching management of sea fisheries in the Irish Sea, white fish stocks declined. As new markets for shellfish have emerged, the fishing industry has shifted to trawling for scallops (*Pecten maximus* and *Aequipecten opercularis*) and potting for lobsters *(Homarus gammarus),* common crabs (*Cancer pagarus*) and common whelks (*Buccinum undatum*)– which has put pressure on these resources. The purchase of extensive territorial waters by the Isle of Man Government from the United Kingdom Government in 1991 has allowed more sustainable management of this resource to be introduced, improving job security for those employed in this sector.

Due to a lack of indigenous coal resources, water power was utilised during the Industrial Revolution to pump water from the Island's mines. A demand for miners' housing at the time led to the expansion of otherwise small villages such as Laxey and Foxdale. Disused engine houses, wash houses, spoil heaps and railway lines from this era now form a culturally valuable part of the landscape.

A surge in tourism accompanied the Industrial Revolution, with visitors from industrial cities in the UK seeking to experience the Island's fresh air and tranquil land and seascapes. An abundant supply of fresh water made accommodating these visitors possible, and the construction of hundreds of hotels and guest houses led to the creation of spectacular Victorian seaside frontages, such as that of the promenade in Douglas. The Isle of Man has a rich transport heritage and the largest narrow gauge railway network in the British Isles, with several historic railways and tramways still in operation. This remains a significant source of tourism interest.

Current status

In common with most countries, the Island has faced considerable financial challenges recently. The response from the Government has been to work through an 'Agenda for Change' with three key priorities which are to:

1) Protect the vulnerable,

2) Grow the economy, and

3) Balance the budget.

'Vision 2020' produced by the Department of Economic Development maps the future of the Island's economy.

The inherent small-scale of industry on an island requires a novel approach to ensure continued viability. This is particularly true of the three main food processors – the meat plant, creamery and flour mill (see section 15.3) – the success of which relies on productive farmland and support from Government. This is highlighted in the recent Food Strategy, entitled 'Food Matters', which emphasises the need for continued resilience and sustainability.

In accordance with Vision 2020, many organisations within both the public sector and the private sector are making concerted efforts to ensure their economic activities are more sustainable, for example through having accredited Environmental Management Systems (see section 13.2 and 15.1).

A main focus of Government's capital projects has been modernising the Isle of Man's infrastructure, which has enabled the Island to reduce its greenhouse gas emissions. The generation of electricity has evolved from oil to diesel and is now predominantly from a natural gas fired power plant. Contributions also come from the 'Energy from Waste Plant' and a small hydro-electric facility below the largest drinking water supply reservoir.

The Government continues invested in the commercial sector and publicly owned housing to reduce dependency on imported energy, improve economic competitiveness, and reduce heating costs for vulnerable households. This has had the effect of decoupling growth (GDP) from CO_2 emissions. In the period 1990 to

2006, the Isle of Man's GDP increased by 230%, while per capita CO_2 emissions decreased by 3%. These reductions are continuing.

The Department of Economic Development (DED) is keen to help businesses to become more energy-efficient as well as identifying Clean Tech as a potential economic growth sector. The DED offers 0% Green Loans and Energy Champion training courses for the business community, which has attracted great interest.

Significant efforts have been made to better manage the impacts of waste. The 2012 Waste Strategy has an aim to recycle 70% of all waste by 2022. The opening of the Energy from Waste plant enabled municipal landfill sites to close, significantly reducing methane emissions (a potent greenhouse gas), while contributing energy to the national grid.

The Island's drinking water supply is secure and remains of very high quality, coming from open reservoirs in upland catchments. Tertiary sewage treatment is not yet fully deployed across the Island with two-thirds of the population served by treatment works in 2014. Secondary sewage treatment is in operation in some areas, which has led to improvements in bathing quality of sea water.

Local domestic and business travel is by road, and transport to and from the island is by air or sea. Local transport is mainly by private car; road vehicle licencing rates based on emissions rather than engine capacity have been introduced in an effort to encourage more efficient vehicle use. Buses form the backbone of the Island's public transport system. These are publicly owned and provide a frequent service at relatively low cost.

Promotion of the Island's values, practices and culture is actively undertaken by a wide variety of Government agencies and various groups and individuals. Safeguarding our culture is a stated part of Government policy and an important contributor the maintenance and support of the Island's high 'quality of life'.

The Isle of Man has a thriving voluntary sector which fosters human development. Charitable activity is strong. It is notable that a famous UK charity, the Royal National Lifeboat Institution (RNLI), began in Douglas, Isle of Man. Sir William Hillary was inspired to found the RNLI in 1824, after becoming aware of frequent shipwrecks around the Island's rugged coast.

A further example of a vibrant voluntary and community engagement in Island life is the Fire Service and Civil Defence organisation. There is only one Full-time Fire Station. In support of this, there are 110 retained firefighters contributing to the fire service across the 7 fire stations in the Island. IoM Civil Defence, a civilian volunteer organisation with 50 members remains active in the Island, typically provides over 4,000 member hours per annum of support in times of emergency to assist in keeping the Island a safe place to live. Additionally, Civil Defence volunteers form part of the inland hill search and rescue team.

The Tourist Trophy Races (and Manx Grand Prix/TT Classic Motorcycle races) are major annual tourism and culturally significant events that continue thanks to over 500 volunteer Marshalls (comprising locals and tourists) who are required to provide "line-of-sight" coverage around the entire 37 ¾ mile (60.72km) course, as well as scrutineering and organisational roles (see section 15 for further details).

For the future, the Government is promoting and implementing economically, socially and environmentally sustainable development, recognising that this requires the nurturing of the island's natural assets as well as their sustainable use. Being an island, inputs and wastes are clearly visible and the value of the "circular economy" is apparent. There is considerable potential to further apply the "circular economy" concept.

Securing flows of ecosystem services

The economic and human development of the island's people began with the original Celtic settlements, accelerating with invasion and settlement by Vikings from present-day Norway. The current characteristics of the landscape and distribution of settlements have, however, largely been shaped in more recent times.

On the lowlands, fertile soils allowed the expansion of farming, resulting in a patchwork of small fields lined by hedges and the creation of many small settlements. Harnessing water power from the Island's rivers initially allowed flour mills to be constructed and later, with the Industrial Revolution, came woollen mills.

Human settlement relied on ecosystem services, and continues to do so. There have been two ecosystem services assessments carried out to date (see Section 12).
The following important ecosystem services have been identified:
1. Provisioning services –
- food provision (cereals, red meat, dairy goods, shellfish and crustaceans, grazing for livestock)
- water availability purification from the upland peat water catchments raw materials such as fencing material and firewood

2. Regulating services –
- climate - carbon sequestration within soils and peat
- coastal flooding/erosion – mitigation through natural processes where possible and preparation for future climate impacts on coastal settlements.
- Pollination –

3. Cultural services –
- recreation, mental and physical health – accessibility of a range of recreational spaces close to residents and visitors
- sense of place
- tranquillity
- dark night sky sites

A large proportion of the uplands is in government ownership and managed for grazing, game and recreational use, in addition to providing important

wildlife habitat and the Island's domestic water source. A review of upland management has been undertaken and an Uplands Strategy is in preparation.

Marine and terrestrial ecosystem services have been quantified in recent studies, but there remains considerable potential to integrate an understanding of ecosystem services into sustainable management decisions.

3.3 "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".

(Please indicate current or planned activities).

"An insulated tract of land, such as the Isle of Man, always presents a favourable field for the observations of the naturalist, particularly when, as in this case, it furnishes a kind of commentary on the natural history of the adjoining kingdoms."

Edward Forbes (1838)

Environmental education is seen as essential and is provided for all 12,000 primary and secondary pupils in the Island's schools. The Department of Education and Children (DEC) has a curriculum entitled Essentials for Learning, which is followed by all schools. Environmental education may appear in Science and Geography but could also appear in cross-curricular dimensions in the context of the Global Dimension, Manx Heritage and Culture and Citizenship. Island schools are also encouraged to follow the Eco-Schools Programme where possible; wikipedia pages are developed for mutual use and educational value within and for schools and peers (see section 16.2). Manx Wildlife Trust (MWT) provides a range of environmental education activities to raise awareness of biodiversity to local school children, primarily through their Biodiversity Education Officer.

The Curraghs Wildlife Park (part of DEFA) also has an education officer and organises activities aimed at raising awareness of global and local biodiversity.

Education for Sustainable Development

The One World Centre, a very active local charity, and project partner, is involved in providing specialist training to teachers and pupils on Fairtrade and global development issues amongst the wider population and has been active on the Island for over 10 years. In 2008, the Isle of Man was awarded Fairtrade Island status and this is renewed regularly. In 2014, the group won an international award from the UK FairTrade foundation

(www.fairtrade.org.uk) for the group and the Isle of Man "Outstanding Project in the twenty years of the Fairtrade Foundation's existence".

Manx Wildlife Trust provides a variety of opportunities for members of the local community and visitors to get directly involved with nature conservation activities and projects. These include:-

- family activities such as rock-pooling, pond-dipping and nest box workshops,
- a programme of public events such as talks, boat trips and walks, including walks around the orchid meadows at the Close Sartfield Reserve,
- voluntary conservation management on MWT reserves,
- setting up a network of marine wildlife interpretation sites around the coast of the Island, consisting of information panels and free-to-use pedestal mounted binoculars,
- running 2 visitor centres, at the Ayres National Nature Reserve in the north and at Scarlett in the south.

Wildflowers of Mann is a government partnership project managed by MWT, which provides a demonstration garden, raises seeds and plants of local origin, advises on the production of wildflower habitats for government projects and as a consultancy, and runs the Dubs for Wildlife and Ramsey Forest projects. Dubs for Wildlife involves the renovation of field ponds that have been neglected, in order to conserve rarer species. The Ramsey Forest Project is a 30-year initiative to plant broadleaved forest that will link existing ancient woodland fragments and provide community benefits.

As for research and monitoring, many different voluntary groups are involved in gathering biological information, undertaking research, promoting the significance of their specialist area and involving people. Together they make up the Biological Recording Partnership and are represented on the Nature Conservation Forum.

Please find below an alphabetical list of groups represented on the Manx Conservation Forum:

Beach Buddies
Centre for Manx Studies
Curragh Wildlife Park
Isle of Man Beekeepers
Isle of Man Farming and Wildlife Advisory Group
Isle of Man Friends of the Earth
Isle of Man Natural History and Antiquarian Society
Isle of Man Woodland Trust
Mammal Society
Manx Basking Shark Watch
Manx Bat Group
Manx Birdlife

Manx Butterfly Conservation
Manx Fish Producers Organisation
Manx Footpaths Conservation Group
Manx Game Preservation Society
Manx National Heritage
Manx National Farmers Union
Manx Native Trees
Manx Ornithological Society
Manx Society for Marine Conservation
Manx Whale and Dolphin Watch
Manx Wildlife Trust
Seasearch
Society for the Preservation of the Manx Countryside and Environment
Wildflowers of Mann (a Manx Wildlife Trust project)

Marine

The Island has a long history of marine research, dating from Edward Forbes whose 200th anniversary was in early 2015. From 1892 to 2006, Liverpool University's Port Erin Marine Laboratory (PEML), studied marine life, providing a sound basis for understanding marine ecosystem services. A key aim of fisheries policy is to ensure more sustainable food production from the sea.

An experimental Closed Area at Port Erin was established in 1989[4] and became the first Manx fisheries closed area promoting sustainable fisheries management. The scallops (*Pecten maximus* and *Aequipecten opercularis*) within it are now at a density ten times higher and have a biomass 20 times higher than in the surrounding unprotected sea. Since PEML closed in 2006, Bangor University have provided the Isle of Man Government with fisheries management advice, with scientists working alongside fisheries scientists and managers in the Isle of Man government.

The Isle of Man has an active diving community, and local divers trained through the Marine Conservation Society's Seasearch programme actively contribute to marine research and survey. Fishermen are also actively engaged in marine research; a number have received fisheries science training via the DEFA 'Fisheries science for fishermen' programme.

DEFA is currently developing a five-year Sustainable Fisheries Strategy and also a Marine Protected Area Strategy that will shape fisheries management including marine conservation in the medium term. Consultation with the

4 https://www.york.ac.uk/media/environment/documents/people/bryce/Stewart%20et%20al%20(2013)%20Closed%20areas%20for%20scallop%20fisheries.pdf

fishing industry and the wider community will be a vital part of the development of these strategies.

4. CRITERIA FOR DESIGNATION AS A BIOSPHERE RESERVE:

[Article 4 of the Statutory Framework presents 7 general criteria for an area to be qualified for designation as a biosphere reserve which are given in order below.]

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

(The term "major biogeographic region" is not strictly defined but it would be useful to refer to the Udvardy classification system (http://www.unep-wcmc.org/udvardys-biogeographical-provinces-1975_745.html)).

The Isle of Man falls within the Western Palaearctic biogeographic region, and has bioclimatic similarities to the other British Isles Biosphere Reserves, especially North Devon, Dyfi and Galloway and Southern Ayrshire, which describe themselves as 'Temperate Coastal/ Marine Zone' but with notably mild wet winters and cool wet summers, due to the oceanic influence.

Before people arrived on the Island, the predominant vegetation cover would have been temperate broadleaf woodland. Subsequently, the diversity of ecosystems reflects the differing interactions between people and landscape, notably the development of heathland and moorland, and grasslands following deforestation. The Core areas of the Biosphere Reserve cover the full range of extant ecosystems.

Parts of the island and seabed (moorland, most remaining wetlands, coastal heathland, eelgrass beds) have less human intervention and are designated core areas and buffer zone while others are more intensively utilised as human settlements (transition zone) or for marine development and fishing.

4.2 "Be of significance for biological diversity conservation".

(This should refer not only to the numbers of endemic or rare species, but may also refer to species on the IUCN Red List or CITES appendices, at the local, regional or global levels, and also to species of global importance, rare habitat types or habitats with unique land use practices (for example traditional grazing or artisanal fishing) favouring the conservation of biological diversity).

In terms of species richness, David Allen's Flora of the Isle of Man (1984) notes that "*in every plant and animal order (except the wholly freshwater*

ones) that has so far been adequately worked, with striking consistency Man proves to have two-thirds of the Irish total and two-fifths of the British".

No endemic species appear to have evolved, as the island's isolation is relatively recent (9,000 years ago), although endemic sub-species or varieties may yet be found among the lower animals and plants.

The Manx cat, although iconic, is a breed of domestic cat (*Felis catus*) originating on the Isle of Man, with a naturally occurring mutation that shortens the tail. The dominant trait of taillessness arises from a spontaneous mutation, the Manx taillessness gene that eventually became common on the island because of the limited genetic diversity on island. It remains however a curiosity rather than important biodiversity element.

Many species pass through or past the Island on migration, mainly north-south, but some east-west. These include many birds (monitored by the Calf of Man Bird Observatory), butterflies and marine animals. It is a crossroads in the Irish Sea, roughly equidistant from the coasts of Galloway in southern Scotland, Cumbria in the Northwest of England, and County Down in Northern Ireland.

Internationally important species and habitats

Examples of species occurring on the Isle of Man listed by the International Union for Conservation of Nature (IUCN) as Globally Threatened (Critically Endangered, Endangered or Vulnerable) or Near Threatened:
European eel (*Anguilla anguilla*). Critically endangered; good populations have been identified in some Manx rivers. Now CITES and Bonn Convention listed.
Atlantic cod (*Gadus morhua*). Vulnerable; still found in Manx waters but protected by EU Common Fisheries Policy and the Irish Sea Cod recovery Programme.
Curlew (*Numenius arquata*). Near Threatened; breeding trend steady but vulnerable.
Basking shark (*Cetorhinus maximus*). Vulnerable (globally) and Endangered (North Pacific and North East Atlantic); now well studied in Manx waters, a regular visitor during the summer months. Manx waters are thought to play an important role in basking shark reproduction.

Examples of species that are less threatened (IUCN Least Concern) but for which the Island has responsibility through the various Multilateral Environmental Agreements:
Grey seal (*Halichoerus grypus*). Limited mostly to NW Europe; the British Isles are globally important for this species with about 40% of the world population and 95% of the EU population occurring in British waters.

Manx shearwater (*Puffinus puffinus*). A small colony of these burrow-dwelling birds breed on the Calf of Man. The global breeding distribution is of this species focuses on the British Isles. 79 % of the estimated world population of c.340,000–410,000 pairs of Manx shearwaters breed in Britain and Ireland. They are believed to have been exterminated from their eponymous colony on the Calf of Man by the introduction of rats from a wrecked ship in the late 18th Century but in the last decade the colony has been re-established and is increasing – in 2014 the Calf of Man nesting colony had grown to 417 pairs.

Habitats of international importance include the following;

Wetland of international importance. Ballaugh Curragh was listed as a Wetland of international importance (Ramsar site) under the Ramsar Convention in 2006. The site is a complex mosaic of interrelated peatland habitats dominated by grey willow and birch scrub locally known as 'curragh'. Of particular significance is the presence of wet bog woodland, natural dystrophic ponds, *Molinia* meadows on peaty soils, with good populations of marsh orchids. See Appendix 1 for all designation documents of ASSI and protected areas, which includes Ramsar RIS data sheet for Ballaugh Currragh.

Additional nationally important species and habitats

Marine habitats. Eel grass beds (*Zostera marina*), maerl (coraline red algae) beds, intertidal mudflats and other shoreline habitats, horse mussel (Modiolus modiolus) reefs and Ross worm (*Sabellaria spinulosa*) reefs (all OSPAR listed).

Marine species. Skates, rays and other sharks, including porbeagle (*Lamna nasus*) and spurdog (*Squalus acanthiai*) (all OSPAR listed). Risso's dolphin (*Grampus griseus*), listed under CMS (ASCOBANS) and the Bern Convention. A variety of common marine mammals: harbour porpoises are resident and thought to breed in Manx waters; Minke whales (*Balaenoptera acutaerostrata)* are regular visitors; bottle-nosed (*Tursiops truncatus*) and common dolphins (*Delphinus delphis*) are regular visitors. The long-lived mollusc *Arctica islandica* is also present.

Terrestrial habitats. Upland heather (*Calluna vulgaris*) moorland is an EU priority habitat under the Habitats Directive[5]. There are many flower-rich meadows, some with orchids, the area of which has reduced by more than 95% in British Isles since 1960.

Terrestrial species. The Hen harrier (*Circus cyaneus*) population has recently shown evidence of decline, as it has across the UK. Elm (*Ulmus*) species have been widely affected in the UK by Dutch elm disease but 99% remain healthy on the island. Lesser mottled grasshopper (*Stenobothrus stigmaticus*): the Isle of Man has its only British station although it occurs in

[5] While EU directives to not apply to the Isle of Man they are a regional reference point for habitat significance.

Europe on the coastal fringes of France (Normandy and Brittany) as well as Holland's North Sea coast. Lapwing (*Vanellus vanellus*): small numbers breed and pass through the Island in winter. Corncrake (*Crex crex*): recorded very rarely but possibly breeding in the Isle of Man. Red-billed chough (*Pyrrhocorax pyrrhocorax*), has numbers increasing unlike elsewhere in the UK. The Manx population of Leisler's bat (*Nyctalus leisleri*) is one of its most easterly stations**.** Isle of Man cabbage (*Coincya monensis ssp monensis*) is a scarce regional endemic but also recorded elsewhere around the Irish Sea.

Important Bird Areas. Two sites are listed: the Isle of Man Sea Cliffs, for species such as red-billed chough (*Pyrrhocorax pyrrhocorax*) and European shag (*Phalacrocorax aristotelis*); and Isle of Man Hills, for hen harriers *(Circus cyaneus).*

Freshwater species. Salmon *(Salmo salar),* brown trout *(Salmo trutta),* sea trout *(Salmo trutta),* river and brook lampreys (*Lampetra fluviatilis* and *Lampetra planeri* respectively) occur in the cleanest rivers and streams.

Distinctive Manx genes. No Manx endemic species have been identified, but it is highly likely many species have some distinctive genes.

A Biodiversity strategy for the Island is close to final sign off by DEFA prior to debate in Tynwald in October 2015, and when complete and accepted by government will help inform the biodiversity conservation aspects of the Biosphere Reserve. Nevertheless, a substantial set of legislation, government programmes and non-government activities already ensure the biodiversity of the Island and its seas are well managed.

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

(Describe in general terms the potential of the area to serve as a site of excellence for promoting the sustainable development of its region (or "eco-region")).

The Island, being small and having its own government, has the potential to promote and implement economically, socially and environmentally sustainable development to the benefit of all. People on islands are more aware than those in other regions of the flow of goods, services and wastes. Everything which arrives by sea or air must be used, recycled or disposed of.

Isle of Man Government seeks to facilitate broader sustainability and to involve the community. Biosphere Isle of Man has a relationship with EcoVannin, a stand-alone partnership between Government and environmental NGO's. EcoVannin has a number of strategic workstreams, each playing a role in delivering secure, productive and environmentally beneficial outcomes for community, businesses and environment, including support for new technologies, business models and job opportunities.

It will provide an opportunity for individuals and organisations to become more involved in environmentally-related matters, and thereby build connections and relationships which will increase their resilience and prosperity. The workstreams are:

1. **Business**: Support for energy-saving practices, low carbon services, green procurement, support for eco-tourism and related industries, waste management and recycling. This will include encouragement for export opportunities and economic growth, including initiatives to attract clean tech finance activity and businesses to the Island. In addition, the workstream will support the financial services and information technology sectors in responding to the challenges of a sustainable global economy, and in developing business opportunities through innovative funding, administration and financial vehicles for emerging technologies and economic/business models.

2. **Energy**: High on the agenda will be ways to ensure the Island's energy security, whilst continuing to reduce its carbon emissions. This will include appraising, in economic and sustainability terms, all aspects relating to a gradual transition to a low carbon economy. This will encompass not only the generation of electricity but the displacement of oil and gas heating and conventional petrol/diesel transportation with renewable sources of power, heating and transportation. Best practices in energy efficiency and demand side management will be supported within the domestic, commercial and industrial sectors alongside viable and pragmatic embedded micro-generation schemes. We will encourage export of renewable energy from domestic and non-domestic sectors to the local utility company and consequent export to neighbouring jurisdictions, to assist with meeting their renewable targets.

3. **Food**: enabling the Island to become more self-sufficient in a range of foods. This will also include encouragement for export opportunities that are consistent with high standards of animal welfare, and for economic growth in this sector.

4. **The wider environment**: Continued work on conservation and management of biodiversity and ensuring continued delivery of ecosystem services – including maintaining/establishing reserves, keeping beaches and rivers clean, waste reduction and recycling, management of footpaths and greenways.

5 **Education**: Supporting environmentally informed teaching, both in schools and amongst the adult population; recognition of best practices in energy and demand management and nurture a culture of community and individual engagement with environmental and sustainability issues.

6 **Transport**: Initiatives will include the encouragement of low-carbon transportation systems, more use of integrated and accessible public transport, better cycle networks and car-sharing schemes.

7 **Media**: We will foster engagement/support using positive reporting, giving credit where due – but also where necessary, criticism to ensure progress continues. All forms of media will be used to communicate progress and opportunities for involvement. It would also be appropriate to link this workstream to cultural regeneration, arts and heritage activities which provide invaluable focus on re-invigorating a sense of place to the Isle of Man and a sense of worth to communities.

8 **Government**: Departments can lead by example on, for example, waste reduction and recycling, clean procurement, support for low CO_2 business practice, ongoing development of the clean-tech sector, a clear position on climate change. There are also great opportunities for the Island to test new technologies on and offshore, and to develop a finance industry which supports and profits from the sustainability agenda. In addition, as part of the EcoVannin project, the Department of Economic Development has joined EcoVannin to SMILE-GOV, an EU-funded initiative helping small islands share experience and knowledge on how to achieve sustainable futures for their communities (see www.sustainableislands.eu). Whilst the Isle of Man is not eligible for grant funding from the project, not being an EU Member State, it is benefitting fully from input, workshops and networking benefits from the more than 60 island communities participating in the project. It is expected that this will yield measurable benefits to our community in terms of know-how and experience as to how to deliver community benefits, and the importing to the island of valuable skills.

Sustainable government policies

The Island continues to promote sustainable development in various ways, as it has since 2000. Initially a cross-government sustainability committee was established. This was replaced by the Climate Change and Marine Spatial Planning Officer Group and more recently by the Environment and Infrastructure Committee. Sustainable terrestrial land use development is addressed in the strategic planning document, "The Isle of Man Strategic Plan: Towards a sustainable island" (http://www.gov.im/categories/planning-and-building-control/planning-policy/strategic-plan/)

The most recent policy document for the broader Isle of Man Government, Agenda for Change, was recently published to manage the current financial challenge.

Its three key aims are to:

- balance the budget,
- grow the economy and
- protect the vulnerable.

This Agenda for Change notes that:
We must;
"use our natural resources sustainably and ensure we respond to the global challenges, responsibilities and opportunities which food security, energy security and climate change present".
"*identify sustainable ways to reduce financial and environmental cost of energy in the medium and long term*"
"*address the issues posed by the effects of climate change"*
"*produce a marine spatial plan to guide appropriate future commercial use of our territorial seas*"
"*promote the value and utilisation of our amenity, cultural and landscape resources*"
and "*encourage sustainable economic activity in harmony with our natural* resources."

Sustainable land use policies – planning
The Isle of Man Strategic Plan has an overarching aim of enabling development to occur in accordance with the principles of sustainability. The Island Spatial Development Strategy sets out the overall direction of future growth on the Island. In order to grow sustainably, the Island needs to focus the majority of its development within and adjacent to existing settlements. This makes the best use of existing infrastructure and services, reduces dependency on the private car, and limits the greenfield land required for development.

The most significant way the planning system can assist in achieving more sustainable development is through managing where future development is located. However there are other policies within the Strategic Plan which assist in improving sustainability. The Strategic Plan policies ensure that development proposals also take account of

- Flood Risk
- Landscape Character
- Wildlife
- Energy consumption

The Isle of Man Government's Infrastructure Minister has highlighted the importance of the planning system in securing a sustainable future for the Isle of Man in economic, social and environmental terms. Work is continuing to take place to modernise aspects of planning legislation in line with wider Government efforts to streamline administration, enhance transparency, and deliver more customer-focused services.

Public feedback is currently being invited on the Draft Isle of Man Strategic Plan

2015, which will help to underpin decisions on development land requirements across the Island until 2026. Outside of the land-based planning system, the Department is preparing new primary legislation to deal with developments within the Isle of Man's territorial seas, which cover an area of approximately 4,000km^2, or a quarter of the (Northern) Irish Sea, and comprise more than 87% of the total area of the Biosphere Reserve.

Planning is acknowledged to be important to everyone in the Isle of Man. It supports the Government's national priority of growing the economy, while being sensitive to the needs of local communities and the environment. The Department's planning policy and legislation is aimed at delivering a number of national ambitions for the Isle of Man, including:

- *We will live in well-designed, sustainable places where we are able to access the amenities and services we need.*
- *We value and enjoy our built and natural environment and will protect it and enhance it for future generations.*
- *We will adapt our natural and built environment to cope with the threats from climate change.*
- *We will realise our full economic potential with more and better employment opportunities for our people.*
- *We have a strong and resilient Island infrastructure that provides a foundation for our economic and social success.*

Sustainable waste management policies

The current Waste Strategy aims to recycle 70% of all waste by 2022, from a current performance level of ~50%. There is still more work to do on household recycling.

Sustainable energy policies

Since 2006, there has been an Energy Policy with three key aims:

- to maintain the security of energy supply,
- to secure the efficient use of affordable energy, and
- to minimise the impact of energy use on the environment.

Much has been achieved in recent years to move towards more sustainable use of energy. Government has invested in energy infrastructure, the commercial sector and the social and housing sectors to reduce dependency on imported energy and to improve economic competitiveness; this remains an on-going process.

The bottom line of these efforts so far has been an effective decoupling of growth (GDP) from Carbon Dioxide ($CO_{2)}$ emissions. In the period 1990 to 2006, the Isle of Man's GDP increased by 230%, with per capita CO_2 emissions decreasing by 3%. This is an outstanding achievement in the

developed world. The Isle of Man is positioning itself as a centre of excellence for the low carbon and clean technology sector.

Sustainable agriculture and food policies

In terms of land use, 75% of the Island's land area is under the Countryside Care Scheme (CCS), which in 2015 has been renamed the Agricultural Development Scheme (ADS). This has a wide range of cross-compliance requirements in order to maintain land in 'Good Agricultural and Environmental Condition' in order to receive financial support. Further details can be found in Section 15.3.

The inherent small scale of industry on an island requires a novel approach to ensure continued viability. This is particularly true of the three main food processors – meat plant, creamery and flour mill – which are co-operatively owned by farmers, as explained in more detail in section 15.3.

Sustainable fisheries

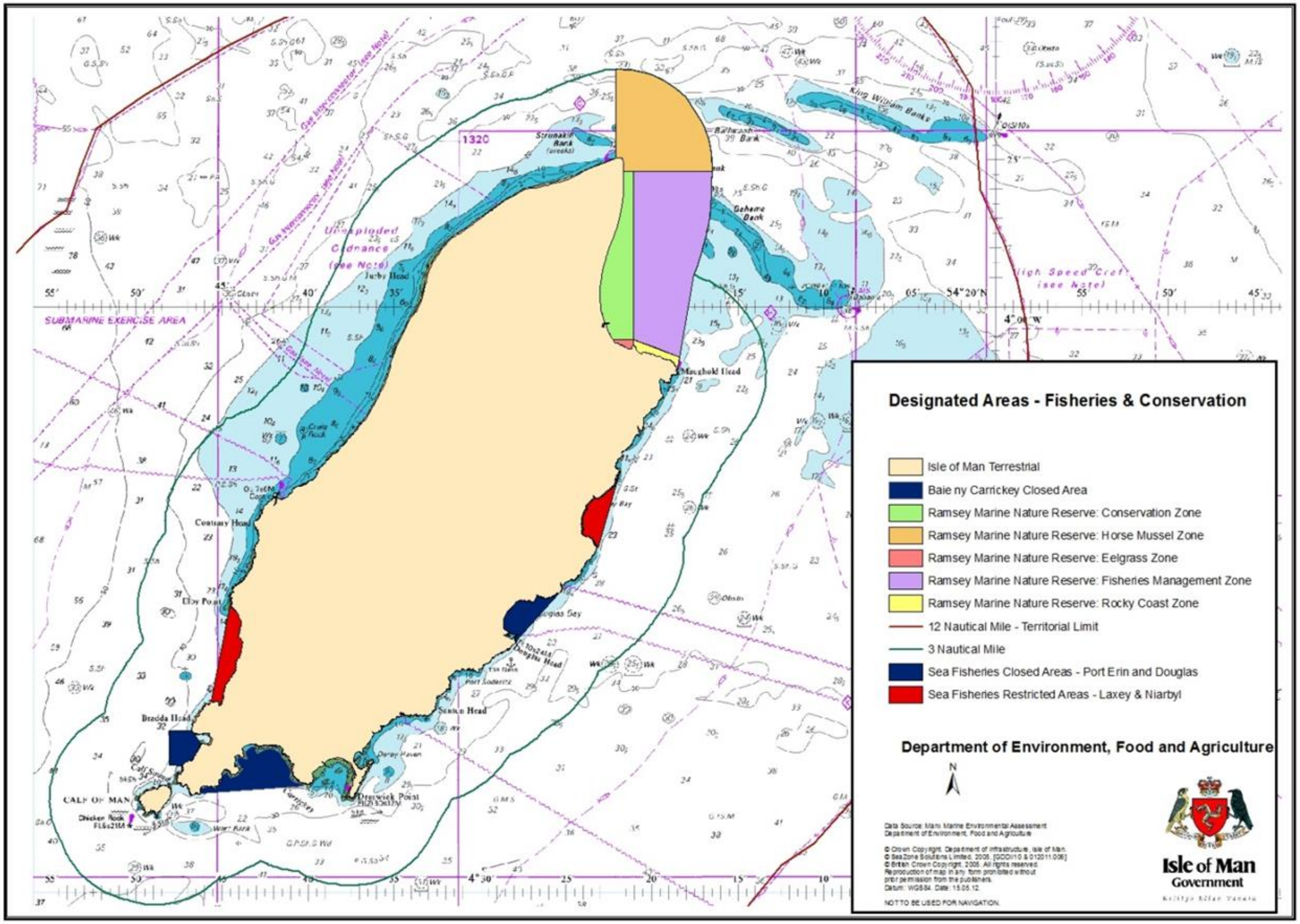
Marine areas are governed by Sea Fisheries bye-laws. Recently, these have led to significant improvements in fisheries sustainability and marine environmental conservation and management. An important part of developing sustainable fisheries is working with the fishing industry. Ramsey Marine Nature Reserve (MNR) was first proposed as a potential protected area by the Manx Fish Producers' Organisation (MFPO) and DEFA has worked with the MFPO to develop and manage the site. Ramsey MNR includes a Fisheries Management Zone which has been leased to the MFPO and is managed by the fishermen, whilst maintaining the ecological integrity of the site.

In 2011, the Isle of Man Queen scallop (*Aequipecten opercularis*) trawl fishery was certified as sustainable by the Marine Stewardship Council (MSC), currently suspended but due to be re-assessed.

A network of fisheries closed areas provides replenishment areas for king scallop (*Pecten maximus*) fisheries and protects important marine ecosystems. The first of these sites, the Port Erin Closed Area, was originally established for research purposes in 1989 but has since become a fisheries management site. When support for closed areas grew in the fishing community, the MFPO were proactive in calling for further sites, leading to the establishment of Douglas Fisheries Closed Area (2008), Laxey and Niarbyl Fisheries Restricted Areas (2009), and Ramsey Marine Nature Reserve (2011). Baie ny Carrickey Fisheries Closed Area was closed initially as a pot fishery management measure. These function as (Marine) Core areas in Biosphere Isle of Man.

More details about Marine Protected Areas in Manx waters can be found in Gell et al (2013) http://www.gov.im/media/983607/3.7_conservation.pdf

Figure 4: Map of Areas Designated for Fisheries and Conservation, Further details can be found in Section 15.3.1


Designated Areas - Fisheries & Conservation
Isle of Man Terrestrial
Baie ny Carrickey Closed Area
Ramsey Marine Nature Reserve: Conservation Zone
Ramsey Marine Nature Reserve: Horse Mussel Zone
Ramsey Marine Nature Reserve: Eelgrass Zone
Ramsey Marine Nature Reserve: Fisheries Management Zone
Ramsey Marine Nature Reserve: Rocky Coast Zone
12 Nautical Mile - Territorial Limit
3 Nautical Mile
Sea Fisheries Closed Areas - Port Erin and Douglas
Sea Fisheries Restricted Areas - Laxey & Niarbyl
Department of Environment, Food and Agriculture
N
Isle of Man Government
NOT TO BE USED FOR NAVIGATION.
SUBMARINE EXERCISE AREA
Jurby Head
Maughold Head
Contrary Head
Bradda Head
CALF OF MAN
King William Banks
Ballacash Bank
Bahama Bank
Strunakill Bank
Dreswick Point
Santon Head
Douglas Head
1320

Sustainable upland and forestry policies
The Isle of Man Government is the owner and landlord for the majority of the uplands and is therefore in a position to implement sustainable upland management and forestry policy, to deliver the optimum range of ecosystem services. The Uplands Strategy 2013 outlines options for more sustainable management in the uplands, taking account of its multiple uses (see section 15.3) through an ecosystem services delivery approach[6].

DEFA's upland estate covers over 7,700 ha of hill land. Until 1999, new conifer plantations were planted on the uplands. Now, new trees are mainly planted in existing forests. *Phytophthora ramorum* has severely affected larch trees on the island. These represent 20% of the plantation estate, and are being cleared in order to minimise the risk of the fungus affecting vulnerable native plants. This creates an opportunity to replace a proportion of some cleared plantations with broadleaved woodland or allow regeneration of heather moorland.

Considerable effort is going into increasing use of the uplands for responsible recreation, which has seen considerable community efforts to develop walking trails, mountain bike routes and other low-impact activities. This is complemented by developing a quality-assured sustainable woodchip and wood fuel supply, which now supplies several sheltered housing schemes and a secondary school, with scope to develop further.

Government is investigating Forestry Stewardship Council (FSC) accreditation for the forestry estate. Improved links with the UK Forestry Commission are assisting with disease management and potentially westerly trials of trees species and cultivars. The government foresters aspire to meet UK Forestry Standards for forestry activities within the Buffer Zone.

DEFA's Forestry Directorate, as a significant landowner in the Island, has undertaken a series of 'green gym' projects with volunteers, corporate groups etc. including:

- Bank of Ireland - Laurel clearing Glen Helen.
- British Trust for Conservation Volunteers (BTCV)- Gorse clearing. Bridge construction and path maintenance, Archallagan Plantation.
- Children's Centre - Mobex - Path clearing. Bird Box installation. Archallagan Plantation.
- PriceWaterhouseCoopers - Installation of Disabled Picnic area - Millennium Oakwood. 2nd Year = Mountain Bike (MTB) trail maintenance installation of boardwalk, South Barrule Plantation.
- Royal Skandia - Various access improvements at Molly Quirks Glen Pathway.
- Friends of the Glens - Path maintenance and ditch clearing.
- Manx Mountain Bike Club - various trail improvements.
- Loughtan Loaded (MTB club) - Ongoing MTB trail improvements Conrhenny Plantations

[6] https://www.gov.im/media/1125997/manx_uplands_final_report_pm.pdf

- Manx Footpaths Conservation Group - Installation of boardwalks and signage along Colden Plantation Warden's Walk.
- Community Services Order Programme - DEFA / IOM Dept. of Home Affairs. Probationary Services Partnership. Ongoing weekend work. Various painting, access improvements, repairs, and other manual tasks across the Forestry Estate.
- Tree planting projects - various groups at various locations.
- Manx Telecom - Community Woodland project at Conrhenny Plantation including Car park install, fencing, picnic areas, pathway improvements, etc.
- Duke of Edinburgh and school projects.
- End2End Committee – Legacy project. The Manx Telecom End2End Mountain Bike challenge has been seeking to help transform Archallagan Plantation into a Community Park with a range of partners.

Demographic Change

Demographic change is also presenting new challenges, as the balance between older and younger generation's changes, with a higher proportion of older and retired people in the population.

It is appropriate to regard senior citizens as a largely untapped resource for potential voluntary work in and for the biosphere reserve. Perhaps the most pertinent example is by a Community Partner, Southern Community Initiatives (www.hubclubsci.im). This is a growing community project that aims to tackle isolation and loneliness at its source by bringing people together through thoughtful and well-researched community projects. Key aims are to provide a "hub" for the recently retired and other isolated people to keep them physically and mentally active in a range of projects.

4.4 "Have an appropriate size to serve the three functions of biosphere reserves"

(This refers more particularly to (a) the surface area required to meet the long term conservation objectives of the core area(s) and the buffer zone(s) and (b) the availability of areas suitable for working with local communities in testing and demonstrating sustainable uses of natural resources).

The Isle of Man covers some 572 square kilometres and the Manx Territorial Sea out to a maximum of 12 nautical miles (22.2km), comprising a further 3,998 square kilometres.

In terms of meeting long-term conservation objectives, the Isle of Man government aims to:

- *manage biodiversity change to minimise loss,*
- *maintain and where necessary restore or enhance native biodiversity, and*
- *actively involve society in understanding, appreciating and safeguarding biodiversity.*

The zonation of the proposed biosphere reserve is shown in Figures 5 and 6. ASSIs and other sites under statutory conservation measures and ownership are subject to government management and protocols in place from time to time to ensure appropriate management is in operation.

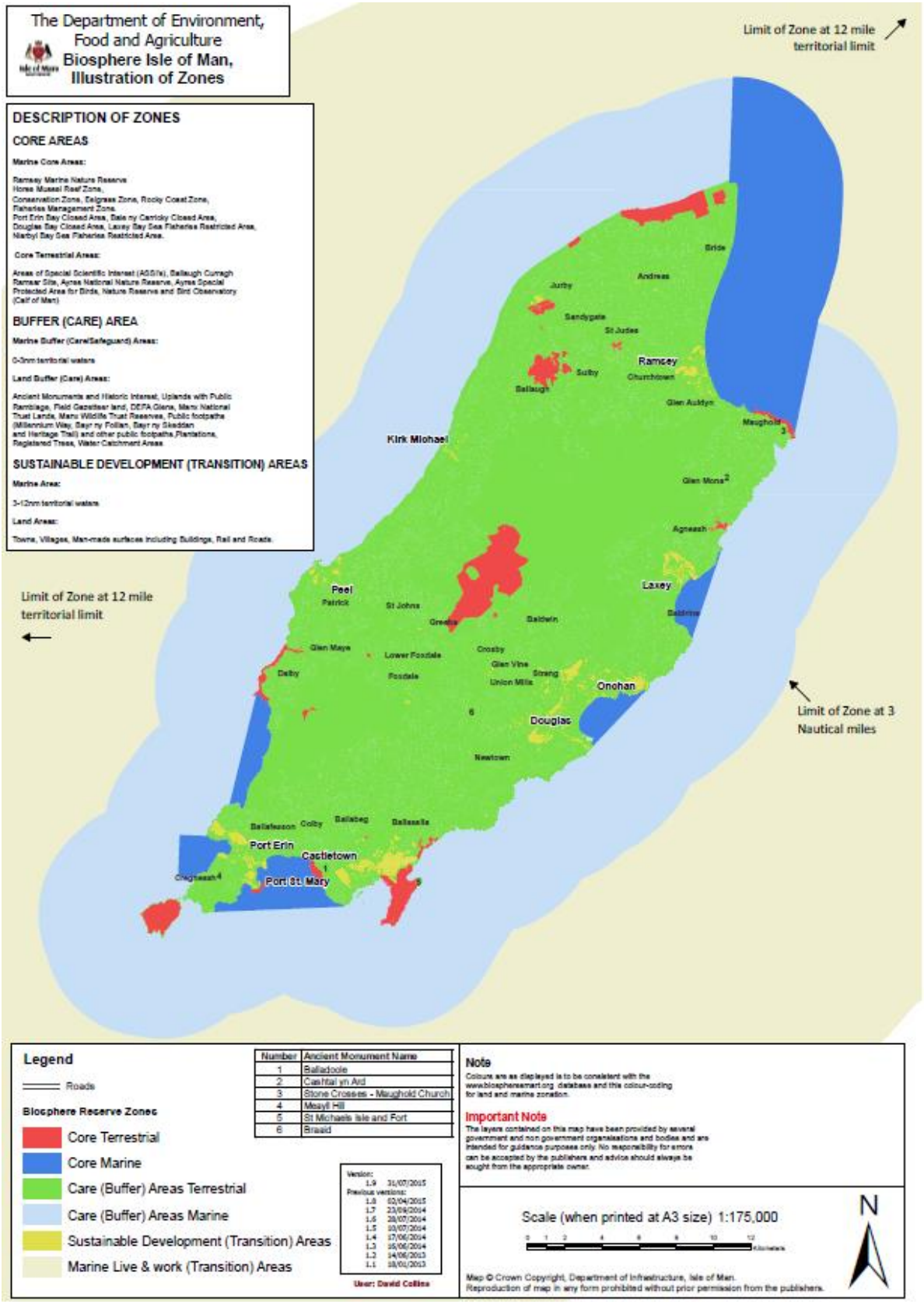


Fig 5: Zonation of the proposed biosphere reserve: detail of land and inshore marine areas

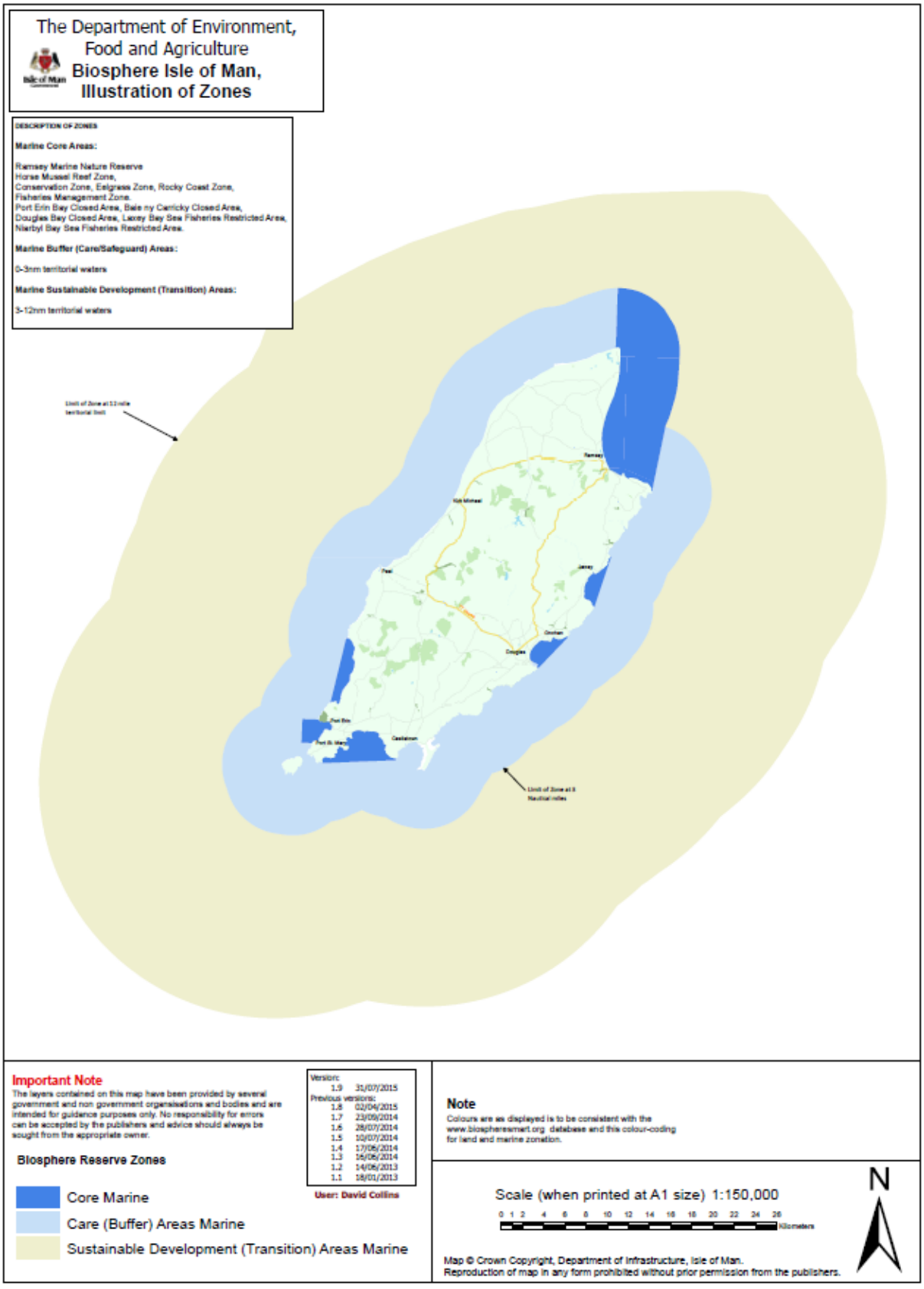


Fig 6: Zonation of the proposed biosphere reserve: detail of marine areas

Terrestrial Core areas
The proposed terrestrial core areas include areas of statutory conservation designation on the land. Currently these 21 terrestrial Areas of Special Scientific Interest , all Biosphere Core Areas, cover 2,758 ha, 4.8% of the island. These protected areas include the Wetland of International Importance at the Ballaugh Curragh and an Area of Special Protection for birds at reclaimed gravel pits at the Point of Ayre. All of these sites are formally protected through the Isle of Man Wildlife Act 1990.

The Calf of Man islet, to the South West of the Isle of Man, a 250-hectare bird observatory of international importance, owned by Manx National Heritage and managed by Manx Wildlife Trust, is also included in the core areas, bringing their total area to 3008 ha.

Marine Core areas
The marine core areas are made up of a number of Marine Protected Areas:

- Ramsey Marine Nature Reserve (comprised of five zones and designated under the Wildlife Act 1990),
- Fisheries Restricted Areas at Niarbyl and Laxey (Sea Fisheries Act 2012),
- Fisheries Closed Areas at Port Erin, Douglas and Baie ny Carrickey (Sea Fisheries Act 2012).

The total area of these six Marine Protected Areas (through Wildlife Act 1990 and Sea Fisheries Act 2012), is 12,390 ha or approximately 3.1% of Isle of Man waters. They include significant areas of habitats such as maerl beds and horse mussel reefs, complying with ecological guidelines on minimum areas for conservation benefit.

Terrestrial Buffer zone
The terrestrial buffer zone outside of statutorily protected land is made up of all land outside of the core and urban areas. This comprises Manx National Heritage lands, Manx Wildlife Trust lands, uplands, farmland, glens, plantations, Registered Tree Areas, public footpaths and other recreation zones. Much of this land is recognised as having high landscape value and is criss-crossed by hedgerows, road verges and watercourses, giving it a cohesive ecological character with strong elements of connectivity.

The Island has a total of 688 miles (1,107 km) of public roads, all of which are paved. The borders (verges) of these roads of highest ecological value have been identified by the Department of Infrastructure, and categorised as Sensitive Verges or Conservation Verges and managed accordingly.

The terrestrial Buffer zone comprises 46,563 ha, or 81.4% of the land area of the Isle of Man. Land use management is determined through the Isle of Man Strategic Plan. Landowners have been provided with a (voluntary) Biosphere Isle of Man Code of Practice (Appendix 4) which clarifies the legislation, codes of practice and Best Practice measures landowners are invited to apply to their land. This operates in parallel with Agricultural Codes of Practice aiming to keep land in Good Agricultural and Environmental Condition.

The breadth and depth of Statutory Land Management legislation and Codes of Practice are judged sufficient to regard the vast majority of land in the Isle of Man as being under management compatible with conservation. Any concerns arising are investigated by Field Officers of Department of Agriculture and Environment as part of cross-compliance inspections; further details are provided in Section 15.3.1. The Biosphere Isle of Man Code of Practice has also been supported by Farmers, and is shown in Appendix 4.

Marine Buffer zone
The marine buffer zone comprises the 0-3 nautical mile zone round the Island outside of Marine Core areas (below mean high water mark) has been agreed as buffer with the Manx Fish Producer's Organisation. This represents 68,107 ha of the marine area). This is protected through the fisheries regulation and legislation. This area is considered large enough to ensure the long-term conservation of all its features.

Terrestrial Transition areas
Urban land, comprising the largest towns and villages and their development boundaries, make up the terrestrial Transition Zone. GIS mapping has made it possible to accurately allocate all man-made items including all buildings, which can be regarded as Transition Areas, even though they are not in the larger towns and villages. In aggregate, these man-made features add up to 7629 ha or 13.3% of the Island's land area.

Marine Transition area
The coastal buffer and transition zones (the transition zone covers the seas between 3 and 12 nautical miles (5.6 and 22.2km respectively) from the shoreline have been extensively researched and this research continues. This work has led to an increased understanding of the ecosystem services that this area can sustainably provide to the Isle of Man and neighbouring jurisdictions. The area is potentially rich in untapped power in the form of tidal and wind energy, with projects being developed to harness renewable power generation from the best areas around the Isle of Man. These will be required to undergo rigorous Environmental Impact Assessment in the same way as other marine developments, and will be progressed through Marine Consenting mechanisms which are under development.

Multiple opportunities for furthering sustainable development objectives exist in the Buffer Zones and Transition Areas of the proposed biosphere reserve.

4.5 Through appropriate zonation:
The context of the Isle of Man being a self-governing Crown Dependency with its own laws and its own parliament, Tynwald, hence effectively a small country, has meant having to consider how the broader island, economy and community could be placed into the three zones required under the Statutory Framework. Particularly relevant to note is the extent and ownership of the Territorial Waters which comprise 399,800 ha in addition to the Isle of Man's land area. The fact that this nomination refers to an entire jurisdiction means that this documentation is significantly different to other biosphere reserves, as is displayed below.

Table 1: Comparison between Biosphere Reserves with significant marine elements and the Isle of Man being an entire jurisdiction.

Braunton Burrows Biosphere Reserve, North Devon, England, UK (population 150,000)	Total Area (ha) 380,140	% of area
Core	1,330	0.35%
Buffer	3,290	0.87
Transition	375,517 (of which 147,000 ha marine)	98.78

Fuerteventura Island, Carary Islands, Spain (population 104,072)	Total Area (ha) 354,288	% of area
Core	74,302	21
Buffer	197,855	55.8
Transition	82,131	23.2

El Hierro Island, Canary Islands, Spain (pop. 10,995)	Total Area (ha) 29,600	% of area
Core	1,184	4
Buffer	15,984	54
Transition	12,432	42

Dublin Bay Biosphere Reserve, Ireland (pop. >300,000)	Total Area (ha) 30,500	% of area
Core	5,000	16.4
Buffer	8,200	26.9
Transition	173,000	56.7

Menorca, Balearic Islands, Spain (pop. 94,383)	Total Area (ha) 70,200	% of area
Core	2,808	4
Buffer	27,378	39
Transition	40,014	57

Biosphere Isle of Man, (pop. 84,500)	Terrestrial (ha) 57,200	Marine (ha) 399,800	Total (ha) (terrestrial and marine) 457,000
Area of Core Area(s)	3,008 (5.3% land area) (inc. some inter-tidal areas)	12,390 (3.1% - below Low water mark area)	15,398 (inc. some inter-tidal areas as Core) 3.4%
Area of Buffer Zone(s)	46,563 (81.4% of the land area)	68,107 17.0% marine areas	114,670 25.1%
Area of Transition Area(s)	7629 (13.3% of the land area)	319,303 79.9% marine area	326,932 71.5%
TOTAL:	57,200	399,800	457,000

"(a) a legally constituted core area or areas devoted to long term protection, according to the conservation objectives of the biosphere reserve, and of sufficient size to meet these objectives".
(Describe the core area(s) briefly, indicating their legal status, their size, the main conservation objectives).

Core areas are those with pre-existing statutory nature conservation designations such as Areas of Special Scientific Interest (IOM equivalent of the UK designation of Site of Special Scientific Interest, SSSI), National Nature Reserve, Special Protected Areas and Marine Nature Reserve(s), all protected through the Wildlife Act 1990. Alongside this is the Calf of Man, which is owned by Manx National Heritage and managed by Manx Wildlife Trust. The Calf also has a long-standing Bird Observatory.

Table 2: Terrestrial Core Area(s)

Core areas	Protection regimes
Ayres National Nature Reserve (Central Ayres ASSI)	Designated ASSI under Wildlife Act 1990 section 27 in 1995. Afforded National Nature Reserve status under section 31 in 2000. Subject to Ayres Byelaws 2005.
21 ASSIs	Designated ASSI under Wildlife Act 1990 section 27. Some also subject to cross compliance rules of Countryside Care Scheme. Some on private land without public access. Others subject to customary public access (e.g. Langness, Derbyhaven and Sandwick ASSI). Management Agreements are offered to land managers as incentives for positive management, within budget constraints.
Calf of Man	The island is a nature reserve and Bird Observatory, owned and managed by Manx National Heritage under the Manx Museum and National Trust Act 1959. Subject to byelaws.
5 Manx Wildlife Trust Reserves	Owned and/or managed by organisation with primary wildlife conservation aims: these are also ASSI and part of the Ballaugh Curragh Ramsar Wetland of International Importance. Public access is managed. Management Agreements are offered by DEFA to MWT to assist positive management.
All of terrestrial core area	"Isle of Man Strategic Plan – Towards a Sustainable Island" guides decisions on development planning proposals on land.
Ballaugh Curragh	Designated as a Wetland of International Importance in 2006, and given legal status in the Isle of Man through the Wildlife Act 1990 ASSI designation. This ASSI is formed from various sub ownerships including MWT, MNH, DoI, DEFA and small areas of private land, where Management Agreements are offered to land managers for positive management.

"(b) a buffer zone or zones clearly identified and surrounding or contiguous to the core area or areas, where only activities compatible with conservation can take place".
(Describe briefly the buffer zones(s), their legal status, their size, and the activities which are ongoing and planned there).

Table 3: Buffer Zone(s)

Buffer zone areas	Protection regimes
16 Manx National Glens	Owned and/or managed for biodiversity and amenity/public access by the Department of Environment, Food and Agriculture. Two glens are ASSIs and therefore included in Core Area(s).
Manx National Heritage land	1,550 ha managed for their cultural and natural heritage, excluding areas which are core areas (notably Ballaugh Curragh, Calf and Ayres). Falls under the Manx Museum and National Trust Act 1959. Subject to byelaws.
DEFA owned uplands	13,000 ha. Open access and covered by farming and shooting tenancies, subject to good management practice conditions as well as cross-compliance rules of Countryside Care Scheme in the case of farmers, and Heath Burning Code (2010) in the case of farmers and shooting tenants.
Manx Wildlife Trust owned land (not ASSIs)	Ownership of reserves by Manx Wildlife Trust is covered in their Memorandum and Articles of Association; *To establish, form, own and manage bird sanctuaries or nature reserves for the conservation and control of wild plants and other vegetation and of the wild creatures of any description living naturally therein.* (Clause 3.II)
All terrestrial buffer zone	"Isle of Man Strategic Plan – Towards a Sustainable Island" covers any development planning proposals on land, not covered by Permitted Development Orders. Strategic Policy 2 states New Development will be located primarily within our existing towns and villages, or where appropriate in sustainable urban extensions of these towns and villages. Development will be permitted in the countryside only in exceptional circumstances.
Farmland	Section 30 (Wildlife Act 1990) Management Agreements are offered to land managers as incentives for positive management where protected species occur. Farmland under the Countryside Care Scheme is subject to cross-compliance rules which require that farmers keep land in Good Agricultural and Environmental Condition. Standards can be found with this link. https://www.gov.im/media/277691/cross_compliance_standards.pdf All land owners are offered Stewardship packs containing all codes of good practice for land management.

"(c) an outer transition area where sustainable resource management practices are promoted and developed".
(The Seville Strategy gave increased emphasis to the transition area since this is the area where the key issues on environment and development of a given region are to be addressed. Describe briefly the transition area(s), the types of questions to be addressed there in the near and the longer terms. The Madrid Action Plan states that the outer boundary should be defined through stakeholder consultation).

The outer boundary is defined by the limits of the Isle of Man jurisdiction: 12 nautical miles (22.22 kilometres) or mid-points between the Isle of Man and UK or Eire. Stakeholder consultation has been used to gain support for the proposal and agree the boundary between Transition and Buffer zones on land and in the sea.

Terrestrial transition zone
Urban land, comprising the largest towns and villages and their development boundaries, make up the terrestrial Transition Zone. GIS mapping has made it possible to accurately allocate all man-made items including all buildings, which can be regarded as Transition Areas for example business estates and housing outside of urban settlements, even though they are not in the larger towns and villages. In aggregate, these man-made features add up to 7629 ha or 13.3% of the Island's land area. The reason for this approach was to regard all housing as in a "Transition" Zone, rather than smaller settlements and isolated houses being regarded as being in a "Buffer" zone.
Paths, tracks, roads (although man-made) are regarded as being in Buffer Zone.

The overarching strategic aim of the current Island Strategic Plan (approved in 2007) is to "*plan for the efficient and effective provision of services and infrastructure to direct and control development and the use of land to meet the community's needs, having particular regard to the principles of sustainability whilst at the same time preserving, protecting, and improving the quality of the environment, having particular regard to our uniquely Manx natural, wildlife, cultural and built heritage*".

All the policies within the Strategic Plan and all the allocations of land for development within the Area Plans are prepared to meet this overarching aim. In this way, the development of the Isle of Man is consistent with the principles of sustainable development, and why nomination of the whole territory is appropriate for Biosphere Reserve nomination.

Marine Transition Area
This is made up of many marine biotopes and is important for sustainable development of marine resources-wind power and hydrocarbons, fisheries and marine transport.

While the 3-12 nautical mile zone is under the jurisdiction of the Isle of Man, it is not solely managed by the Isle of Man. There are also Fisheries Management Agreements to be mindful of, although significant efforts continue to be made to improve the sustainability performance in this area in co-operation with neighbouring jurisdictions.

Table 4: Marine Transition Area(s)

Marine	Legal status	Size (ha)	Activities ongoing and planned
3-12 nautical mile territorial waters	Owned by Isle of Man Government (Department of Infrastructure)	319,303	Measures in place for sustainable fisheries management and marine species and ecosystem conservation
	Under lease for wind power development	Of which 31,700	Marine planning and development consenting in progress

This applies to Core, Buffer and Transition:
In terms of land use planning, the future development of the Isle of Man is guided by the Island Development Plan. This consists of both an all Island Strategic Plan and more local Area Plans.
When preparing the Island Development Plan, there is a co-ordinated input from across the Isle of Man Government to ensure that future development is located in areas which are accessible by means other than the private car, are not within areas of known flood risk, and taking into account the environment of the Island. This means that, in most cases, development is directed to be within or closely adjacent to the existing settlements of the Island.

The open countryside is protected for its own sake, meaning that there is a presumption against development in such areas and in the sites across the Island which have been granted statutory protection afforded the highest level of protection.

Broader economic development between the private sector and the Isle of Man Government is facilitated through a broad business engagement process, the net result being a vision for the Isle of Man economy over the forthcoming decade, 2020 Vision.

Marine
The boundary of the Isle of Man is the 12 nautical mile limit or midpoint between Isle of Man and UK or Eire at sea. For marine ecosystem management, this is an arbitrary line, hence marine management policies are best addressed through dialogue with neighbouring jurisdictions. This happens already, for example the Irish Sea Cod Recovery programme, British Irish Council (BIC) Environment group and Marine Spatial Planning platforms, such as the Celtic Seas Partnership and Irish Sea Maritime Forum. Research collaborations also exist on priority species and habitats including basking sharks, cetaceans, and horse mussels.

The British Irish Council was established as part of the multi-party agreement reached in Belfast on 10 April 1998. Its membership comprises representatives from the Irish Government; UK Government; Scottish Government; Northern Ireland Executive; Welsh Government; Isle of Man Government; Government of Jersey and Government of Guernsey.

External influence
The Isle of Man, by virtue of its International Development Committee (co-ordinated by elected members) also has the scope to engage with a much broader stakeholder audience, and is focussed on helping other small countries meet their sustainable development goals. Further information on this topic can be found at Section 16.3.2.

Terrestrial
In terms of land use planning, the future development of the Isle of Man is guided by the Island's Strategic Land Use Development Plan, and the more local Area Plans which flow from it. All the Policies within the Strategic Plan and all the allocations of land for development within the Area Plans are prepared to meet with this overarching aim. In this way, the development of the Isle of Man is consistent with the principles of sustainable development.

Marine areas are governed by Sea Fisheries bye-laws which have made significant improvements over recent years to improve sustainability standards, in particular through co-management initiatives in partnership with the fishing industry. Other technical measures include larger minimum landing sizes than neighbouring jurisdictions, for example minimum landing size of queen scallops from the Manx Territorial Seas are 55 mm shell diameter compared to 40 mm in adjacent jurisdictions, giving an extra year's growth and greater scope for stock replenishment prior to harvest. Equivalent innovative management methods are in force for the harvesting of king scallops, crabs, and lobster. Spatial and temporal fisheries closures are also important tools in fisheries management in Manx waters to 12 nautical miles.

(d) Please provide some additional information about the interaction between the three areas.

Manx people enjoy close proximity to a great range of countryside and landscapes. People from towns and villages (transition zone) as well as off-island visitors, visit and use the countryside (buffer and some core) for a variety of recreational activities.

There is an extensive network of public footpaths throughout the island, with an estimate of more than 800,000 visits by residents and visitors. There are self-guided "Wardens Walks" in the upland and plantation estate of DEFA. Engagement with community groups has led to several new uses such as geo-caching and mountain bike trails, often developed by local mountain bike clubs, itself often funded or part developed by volunteers from local businesses: see http://www.visitisleofman.com/activeguides/.

The large number of glens and woodlands close to urban areas are invaluable as a means to engage both visitors and residents in having easily accessible nature and such areas are very useful in generating a sense of place and tranquillity. The main urban areas take up 5% of the land area; even with if the smaller settlements, buildings, roads and man-made surfaces are included, the aggregate of developed areas is 8.6%, so open space and recreation areas are close to residents and visitors, which markedly increases their "sense of place".

There are also many cycling clubs, and all children participate in Cycling Proficiency Training whilst at primary school. Youth cycling leagues have been running since April 2006. The island also hosts various long-distance cycling events, such as the Isle of Man Cycle Challenge, The Lighthouses Challenge, Cycle for Life, Longest Day, Longest Ride and the End 2 End Challenge. Cycling is now a common hobby, and success at national and international level continues to be disproportionate to the Island's population. The annual Parish Walk is an adult walking race and is the largest mass participation event, with around 1500 participants, many covering a total distance of 85 miles (>136 kilometres).

Initiatives to get people out into countryside, currently marketed under the banner "Go Do Active", outlines the opportunities for people of the Isle of Man to become more physically active to improve their health and well-being. Through collaborative partnerships across Government, local authorities, private and third sectors, the GoDoActive Group is looking to increase the profile of physical activity and support active living on the Isle of Man. The activities are set out for different age and ability levels to ensure relevance to a wide audience.

4.6 "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 biosphere reserve".

4.6.1 Describe arrangements in place or foreseen.

(Describe involvement of public and/or private stakeholders in support of the activities of the biosphere reserve in core, buffer and transition areas (such as agreements, protocols, letters of intent, protected area(s) plans)).

Designation of core areas under the Wildlife Act 1990 involves consultation with land owners and occupiers as well as users and anyone else affected by the designation as laid down by that Act.

Nomination of the proposed biosphere reserve has involved a Steering Group including a diverse and active community of organisations with responsibilities or interests in retaining the Island's vibrant community, healthy environment and thriving economy. Terms of reference have been agreed *(Appendix 2)* that sets out the governance structure, roles and desired balanced composition of the Steering Group, and its reporting structure in these initial stages. It is intended that the Steering Group and other groups and business communities will facilitate and support relevant initiatives helping them to connect with existing delivery programmes wherever possible.

The Steering Group was established for the purpose of working up nomination papers, but has also acted as a co-ordination body. Terms of reference have been agreed *(Appendix 2)* that sets out the governance structure, roles and desired balanced composition of the Steering Group, and its reporting structure in these initial stages. It is intended that the biosphere reserve will facilitate and support relevant initiatives from the Steering Group and other groups and business communities, helping them to connect with existing delivery programmes wherever possible.

UNESCO Biosphere Steering Group, Composition;
Chair: UNESCO Biosphere Isle of Man Project officer, Department of Environment Food and Agriculture,

Biodiversity Officer Lead:

Manx National Heritage Representative:

Department of Economic Development Representative:

Department of Education and Children Representative:

Commercial Sector Representatives:

Institute of Directors
Manx National Farmers Union
Manx Fish Producers Organisation

Non-Government Organisation Representatives:

EcoVannin
Manx Wildlife Trust
Isle of Man Children's Centre
Centre for Manx Studies
Culture Vannin

This body is expected to evolve, following the nomination, to be the leading body for development of management plans for the biosphere reserve.

The Steering Group has representatives from the main governmental bodies of the Island, as well as the main educational institutions. A number of the main conservation and community bodies that are active locally are also involved, and more can become members by co-option. Other stakeholders have been involved through a number of events and workshops where they have been able to provide inputs to the Biosphere proposal. Similarly, through this process, the local names for the zones of the biosphere reserve evolved to be locally more understandable: Core – remains as is; Buffer – amended to Care zone; and Transition – Sustainable Development Zone.

Since 2013, the idea of designating the island as a biosphere reserve was extensively promoted to the public through attendance at events such as United Nations Day 2013, Manx Royal Agricultural Show 2014, and a series of community events with project partners which reached out to an estimated 15,000 people. A range of means were employed to promote the project, including presentations at meetings and information stands, local press publicity and digital promotion (including web, email and social media). This resulted in an active social media profile which has seen information circulated and commenting on as far as Vietnam and New Zealand and over 2,000 Facebook views for the most popular news stories. Additionally people can choose to register their support as a Biosphere Isle of Man buddy, or "follow" on twitter, or "like" on Facebook which allows them to stay in touch with the project.

4.6.2 Have any cultural and social impact assessments been conducted, or similar tools and guidelines been used?
(e.g. Convention on Biological Diversity (CBD)'s Akwé: Kon guidelines; Free, Prior, and Informed Consent guidelines, Biocultural Community Protocols, etc.). (UNESCO's Programme on Man and the Biosphere (MAB) encourages biosphere reserves to consider and respect indigenous and customary rights through programmes or tools, in accordance with the United Nations Declaration on the Rights of Indigenous Peoples (http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf when relevant and appropriate)).

No. The Isle of Man has no indigenous peoples in the UN sense.

4.7 Mechanisms for implementation:

"(a) mechanisms to manage human use and activities in the buffer zone or zones"? *If yes, describe. If not, describe what is planned.*

Within the core area, mechanisms for managing human use and activities will continue to follow those laid down in legislation including the Wildlife Act, and obligations arising from adherence to the Ramsar and other Conventions. Within the different focal areas of the buffer zones, a range of mechanisms to monitor and manage the areas are in place, detailed in Table 5. No further mechanisms are planned at this stage.

Table 5: Mechanisms for Implementation in Buffer Zone(s)

Area	**Uses and activities**
Uplands	Tenancy agreements with the Government Heather burning act and code Wildlife Act
Freshwater	Manx Watercourse Management Guide (including a code of Good Practice) Angler's Code of Conduct
Farmland	Countryside Care Scheme (being re-named Agricultural Development Scheme during 2015) Countryside code Manx Hedgerow Management Code of Best Practice Wildlife Act Code of Good Practice for the Protection of Water Voluntary Code of Practice for Landowners for UNESCO Biosphere Isle of Man
Marine environment	Basking shark code of conduct WiSE training for wildlife friendly boat operation. Comprehensive fisheries protection

	legislation in the Fisheries Act 2012 Marine Stewardship Council accreditation of the queen scallop fishery Fisheries science for fishermen courses Wildlife Act Coastal Code
Coast	Coastal Code

"(b) a management policy or plan for the area as a biosphere reserve"?
If yes, describe. If not, state how such a plan or policy will be developed, and the timeframe. (If the proposed area coincides with one or more existing protected natural area(s), describe how the management plan of the proposed biosphere reserve will be complementary to the management plan of the protected area(s).

A management plan for the biosphere reserve *per se* has not yet been developed. It is planned to develop such an overarching plan within a year of designation, completing the draft document by end of September 2016 and gaining full community and government support by end of the 2016/17 financial year. An initial set of objectives and potential is listed in Table 6 below. These will be refined during the appraisal period, October 2015 to September 2016, and a management plan elaborated, under the purview of a high-level management committee from government and community.

Meanwhile, many core areas are already subject to management agreements and various sites have formal management plans, including in the marine environment.

The Biosphere Steering Group's **vision** for "UNESCO Biosphere Isle of Man" is that *"the Isle of Man be recognised as a special place for people and for nature*," according to the widely circulated Project Overview Document.

The **objective** of Biosphere Isle of Man is to *communicate locally and more widely about the Island's vibrant community, healthy environment, and thriving economy and the efforts in play to make this more sustainable*. This is captured in the Project Overview of which all partners and interested parties have been supportive. The Management Plan is expected to use the framework below as a means to evaluate performance.

Table 6: Means to evaluate performance of UNESCO Biosphere Isle of Man(UBIOM)

Dimensions	***Criteria/potential benefit***	***Identified benefit***
A vibrant society		
Recreation and access	Active recreation	Management of lands and routes, e.g. uplands, green lanes, glens/plantations, footpaths. Volunteer programme
	Access	"
	Passive recreation and	Website, publicity in tourist and inward

	inspiration	Where You Can literature. Links to historic and cultural events, tourism events
Understanding and awareness	Understanding and awareness	Eco-school projects, public involvement in cultural and community activities. Greater understanding through use of UBIOM Pledge, Project Overview and communication materials
Community	Engagement of UBIOM *with* community	Links with DEFA, DED, DEC and community partners
	Involvement *of* community with UBIOM	Eco-schools activity and use of IOM specific data – Citizen Science
	Vitality and cohesion	Sense of pride in place and shared value; agreed vision
The quality of places to live	Near environment (greenspace)	Footpath usage, public park quality
	Houses and gardens	To do, some good examples
Education/Learning	Research	# of research projects ranging from abiotic, biotic and socio-cultural research at U/G, P/G and PhD levels
Education/Learning	Participants in public/partner events	School visits, business training, Educational sessions pa – Eco-schools, FWAG, MNH, MWT, other partners
Education/Learning	Education/Learning	# of participants, education events

Dimensions	***Criteria/potential benefit***	***Identified benefit***
A healthy environment		
Biodiversity	Species diversity, range and abundance	Contribution to management of core and buffer areas. Volunteer engagement and management. Greater awareness.
	Habitat extent and condition	"
	Structural diversity and connectivity	"
Landscape	Character, condition and qualities	"
Ecosystem services	Quality and productivity of soil, water, air	"
	Carbon sinks	", link to Uplands Strategy
	Other ecosystem services	", land and marine

Other	Any other environmental impacts	Number of participants in events and excursions
Dimensions	***Criteria/potential benefit***	***Identified benefit***
A thriving economy		
Employment and income	Direct employment and income	Diverse economic activity figures, as measured by annual digest of economic statistics
	Indirect employment and income	"
	Job quality	"
Business/Development	Business opportunities and constraints	Branding associated with UBIOM status?
	Enhancing marketing opportunities	"
	Long-term investment	Anticipated as a result of enhanced image and profile of IOM as a jurisdiction
	Human resources	Ability to attract inward investment and business relocation
Resource use	Conservation of resources with tangible and potential economic value	Appropriate management of natural resources
Economic activity	CO_2 emissions vs economic activity	Continued decoupling of economic activity (GNP) vs CO_2 emissions/per capita emissions
	Number of businesses with Environmental Management Systems e.g. ISO 14001, or active Corporate Social Responsibility programme	Environmental or CSR improvement works within businesses
Publicity	Media Articles	Number of media articles in newspapers, journals and other media, total outreach figure

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

As outlined above, a management committee is planned after approval of the nomination and will be formally responsible and answer to Tynwald. Its terms of reference have been approved by Tynwald's Environment and Infrastructure committee.

No new organisation is planned to be established or deemed necessary or desirable at present to implement the proposed Biosphere management strategy. Instead, it is proposed to work through the UNESCO Biosphere Isle of Man Management Committee with DEFA as the lead partner.

Implementation of the proposed management plan in practice will be coordinated by a Delivery Group (with thematic Working Groups as needed). The management plan will be developed after the nomination form is submitted to UNESCO in September 2015.

Implementation will principally be carried out through existing mechanisms, for example Management Agreements for ASSIs, Service Delivery Plans for Department of Environment Food and Agriculture, Manx National Heritage and Department of Education and Children.

Land use and marine planning and Marine Consenting remain under the control of Department of Infrastructure.

"(d) programmes for research, monitoring, education and training"?
If yes, describe. If not, describe what is planned.

Biodiversity
Government has a monitoring and survey programme for biodiversity.
The Isle of Man Government and Bangor University have a research programme for fisheries science and marine conservation. A comprehensive programme of marine environmental monitoring is also in place, led by the Government Laboratory.

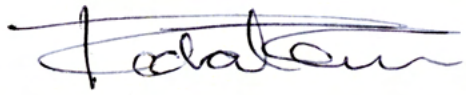
Training is arranged to fill gaps in knowledge of biodiversity, especially difficult groups, e.g. fungi, marine invasive species, ferns and lichens. Specialist trainers are brought to the island and also specialist groups for excursions.

There is also scope to make more use of citizen science for scientific recording and reporting, likely to be energised by designation of the island as a biosphere reserve.

Education
Department of Education and Children remain enthusiastic supporters of Eco-schools activity, and there are Manx specific resources accessible to teachers and pupils, covering a range of environmental and sustainable development topics across several subject areas.

5. Signatories – Contact details and information

5.1 Signed by the authority/authorities Signatory in charge of the management of the core area(s):



Name: Hon. R A Ronan MHK

Post: Minister for Environment, Food and Agriculture

Responsibilities: Management plans for protected areas under Wildlife Act 1990

Thie Slieau Whallian
Foxdale Road
St John's
Isle of Man
IM4 3AS

Web: http://www.gov.im/defa

Email: defa@gov.im

Tel: 00 44 1624 685835

5.2 Authorities in charge of the management of the buffer zone(s):

Name: Hon. P A Gawne MHK

Position: Minister for Infrastructure (Seabed owner)

Responsibilities: Land use planning policy

Sea Terminal
Douglas
Isle of Man
IM1 2RF

Web: http://www.gov.im/doi

Email: doi@gov.im

Tel: 00 44 1624 850000

Name: Tony Pass

Position: Chairman Manx National Heritage (Manx Museum and National Trust)

Manx National Heritage
Manx Museum
Douglas
Isle of Man
IM1 3LY

Web: http://www.gov.im/mnh/

Email: enquiries@mnh.gov.im

Name: Duncan Bridges

Position: Director, **Manx Wildlife Trust**

7-8 Market Place,
Peel
Isle of Man
IM5 1AB

Web: http://www.manxwt.org.uk

Email: enquiries@manxwt.org.uk

Name: Ray Craine

Post in organisation: Patron, Manx National Farmers Union (largest land owning body in Buffer Zone)

1st Floor Quay House
South Quay
Douglas
Isle of Man
IM1 5AR

Tel: 00 44 1624 662204

Email: gensec@manx-nfu.org

Name: David Beard

Position: Chief Executive, Manx Fish Producers Organistion. Largest organisation representing fishermen and processors covering marine areas of the Isle of Man

East Quay
Peel
Isle of Man
IM5 1TA

Email: iomfishermen@manx.net

Tel: 00 44 1624 842144

Name: Hon. P A Gawne

Position: Minister for Infrastructure (Seabed Owner)

Sea Terminal
Douglas
Isle of Man
IM1 2RF

Web: http://www.gov.im/doi

Email: doi@gov.im

Tel: 00 44 1624 850000

5.3 Signed as appropriate by the National (or State or Provincial) administration responsible for the management of the core area(s) and the buffer zone(s):

Full name and title: **Department of Environment, Food and Agriculture (DEFA)**

Signature: Date: 20/8/2015

Name: Hon. R. A. Ronan

Post in organisation: Minister

Address, email, phone number:

Thie Slieau Whallian
Foxdale Road

Address, email, phone number:

Thie Slieau Whallian
Foxdale Road
St John's
Isle of Man
IM4 3AS
UK
http://www.gov.im/defa

defa@gov.im

Tel: 00 44 1624 685835

5.4 Signed by the authority/authorities, elected local government recognized authority or spokesperson representative of the communities located in the transition area(s).

Signature: 

Full name and title: Mr Councillor David Christian, MBE JP, Leader of the Council, **Douglas Corporation, largest single population centre of the Isle of Man**

Post in organisation: Leader Date: 2.7.2015

Address, email, phone number:
Town Hall, Ridgeway Street
Douglas
Isle of Man
IM99 1AD
Tel: 01624 696300

Signature:  Date: 14/7/15

Full name and title: Minister Crookall, Department of Education and Children, responsible for education provision for all publicly funded schools on the Island and their curriculums

Name: Minister Crookall 

Post in organisation Minister

Hamilton House
Peel Road
Douglas
Isle of Man
IM1 5EZ
Telephone:+44 1624 685808

Signature:
Full name and title: Minister Skelly, Minister of Department of Economic Development

Date: 15/7/2015

Post in organisation: Minister
1st Floor
St George's Court
Upper Church Street
Douglas
Isle of Man
IM1 1EX

Telephone:+44 1624 686400

5.5 Signed on behalf of the MAB National Committee or focal point:

Despite the constitutional status of the Isle of Man, this nomination has been prepared in consultation with members of UK-MAB, which is also being used as the main conveyor of the nomination to the UNESCO Secretariat.

Full name and title: Professor M Price, Chair of UK Man and the Biosphere Committee

Date:

Address, email, phone number: Centre for Mountain Studies, Perth College UHI, Crieff Road, Perth, PH1 2NX

Tel: +44 1738 877217 martin.price@perth.uhi.ac.uk

PART II: DESCRIPTION

Contents

6. LOCATION (COORDINATES AND MAP(S)):

6.1 Provide the biosphere reserve's standard geographical coordinates *(all projected under WGS 84):*

Cardinal points:	**Latitude**	**Longitude**
Most central point:	54° 13' N	4° 35′ W
Northernmost point: LAND	54° 25' N	4° 21′ W
Southernmost point: LAND	54° 2' N	4° 48′ W
Westernmost point: LAND	54° 3' N	4° 49′ W
Easternmost point: LAND	54° 17' N	4° 18′ W
Northernmost point: MARINE	54° 33' N	4° 10′ W
Southernmost point: MARINE	53° 50' N	4° 49′ W
Westernmost point: MARINE	54° 0' N	5° 10′ W
Easternmost point: MARINE	54° 17' N	3° 58′ W

6.2 Provide a map(s) on a topographic layer of the precise location and delimitation of the three zones of the biosphere reserve (Map(s) shall be provided in both paper and electronic copies). *Shapefiles (also in WGS 84 projection system) used to produce the map must be attached to the electronic copy of the form.*

If possible, also provide a link to access this map on the internet (e.g. Google map, website…).
www.biosphere.im

Insert zonation map here

7. AREA (see map):

Maps will be emailed separately.

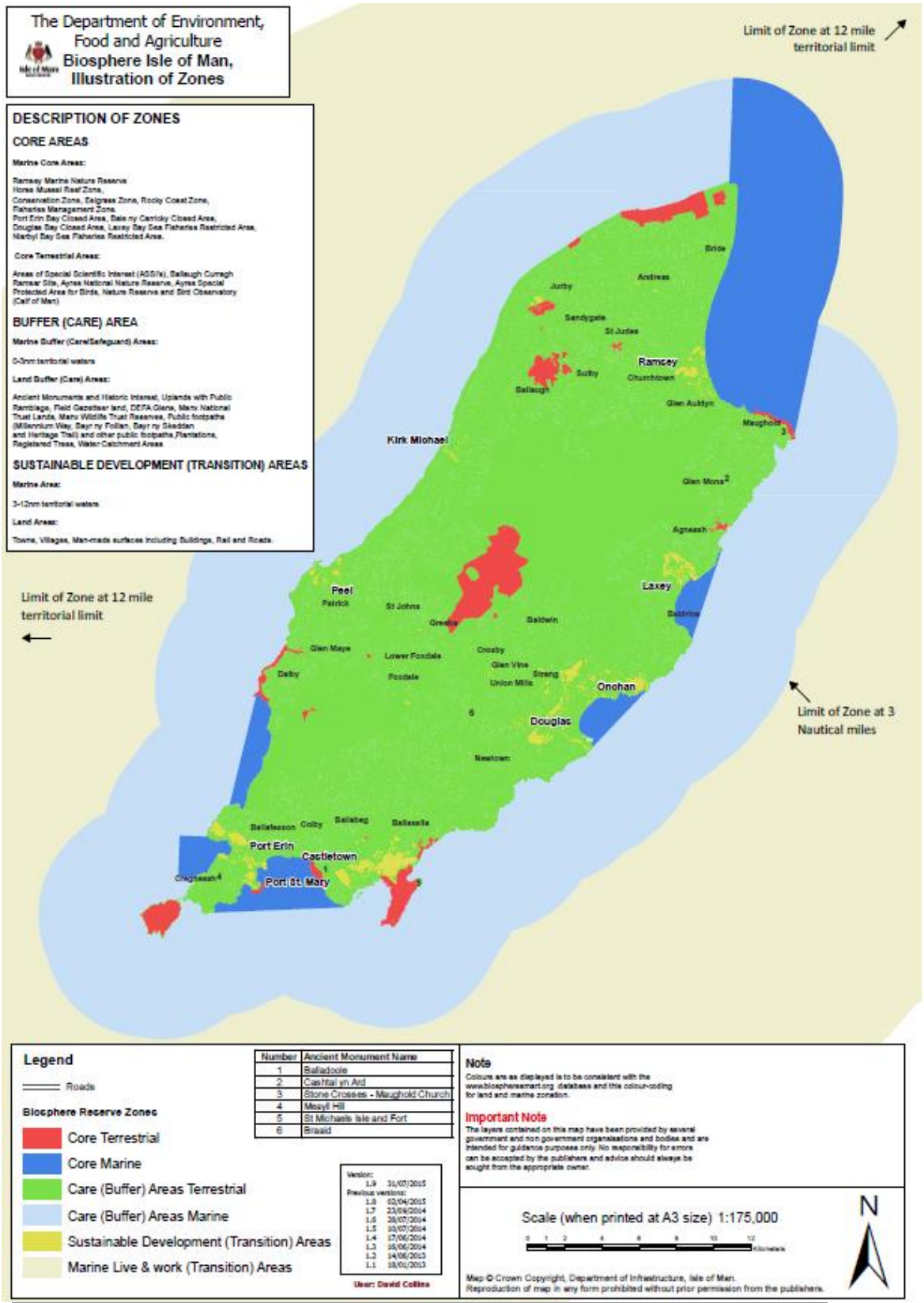


Figure 1: Zonation of the proposed Biosphere Isle of Man: detail of land and inshore marine areas

Figure 1 Zonation map (land)
Legend: Colour coding based on Biosphere SMART website zonation colours for consistency
Terrestrial Core Zone – RED, Marine Core Zone – Dark Blue
Terrestrial Buffer Zone – Green, Marine Buffer Zone – Light Blue
Terrestrial Transition Zone – YELLOW, Marine Transition Zone - Buff

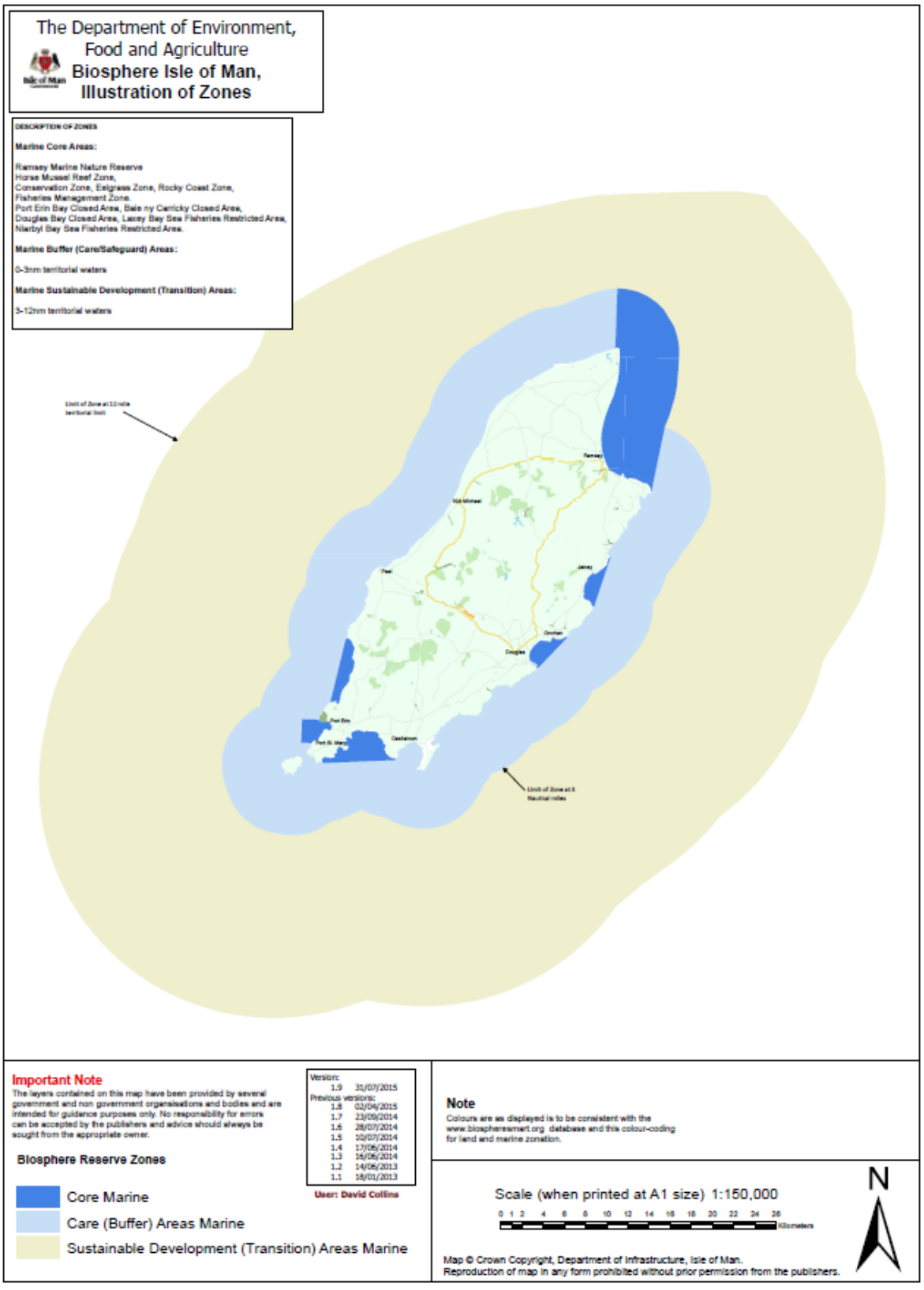


Figure 2: Zonation of the proposed biosphere reserve: detail of marine areas

Table 1: Summary zonation

	Core	Buffer	Transition	Total
Area in ha	15,398 (see A)	114,670 (see B)	326,932 (see C)	3969,800 marine +57,200 land = 457,000 ha
%	3.37	25.09	71.54	100

	Terrestrial (ha) 57,200	**Marine (ha) 399,800**	**Total (ha) 457,000**
7.1 Area of Core Area(s):	3,008 (5.3% land area (inc. some inter-tidal areas)	12,390 (3.1% - below low water mark area)	15,398 A (3.4%)
7.2 Area of Buffer Zone(s):	46,563 (81.4% of the land area)	68,107 (17.0% marine area)	114,670 B (25.1%)
7.3 Area of Transition Area(s):	7,629 (13.3% of the land area)	319,303 (79.9% marine area)	326,932 C (72.1%)
TOTAL:	**57,200**	**399,800**	**457,000 (inc. some inter-tidal areas as Core)**

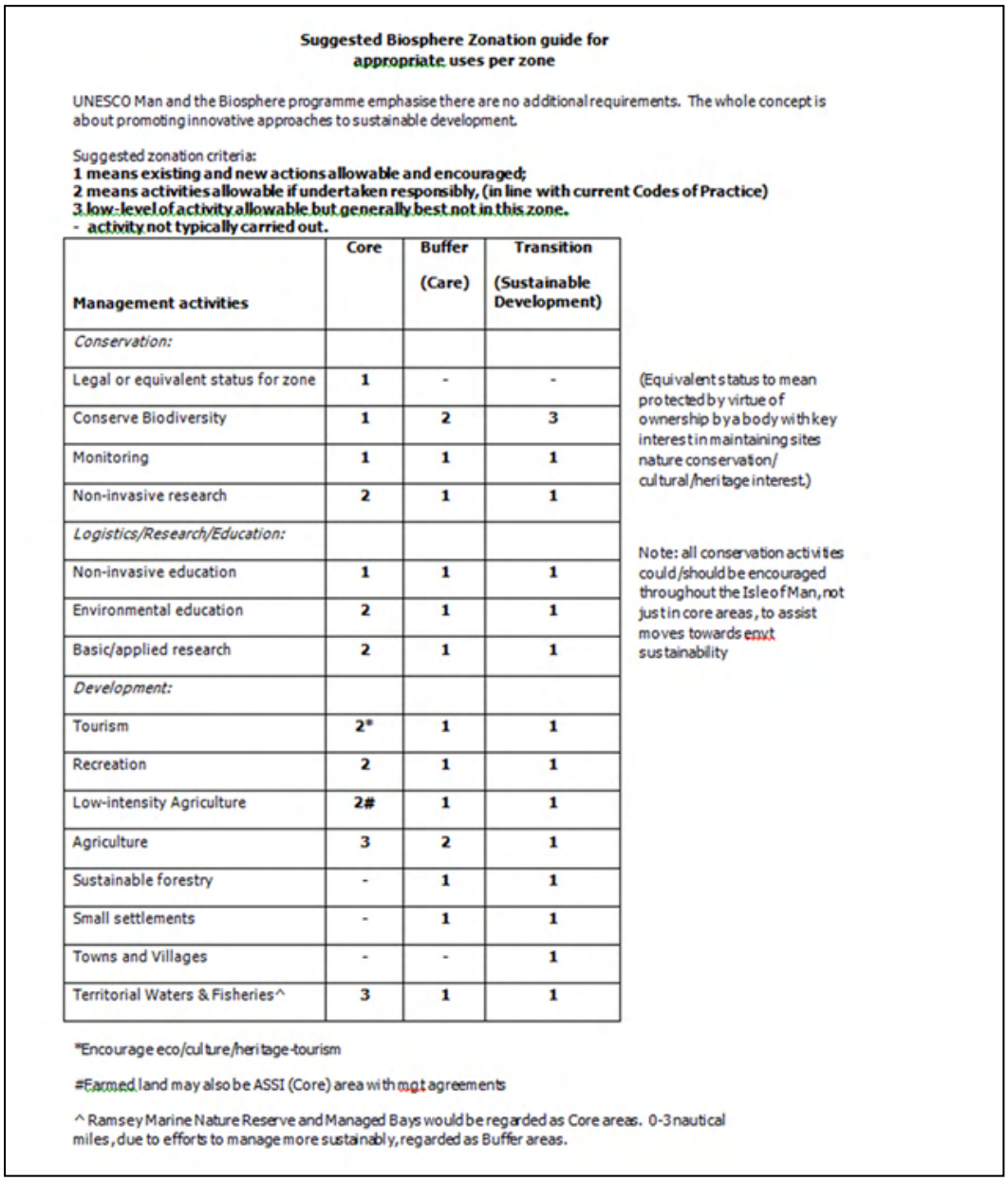
Marine Closed/ Restricted Area	**Legislation**	**Year implemented**	**Restrictions**		**% Of Marine Area**
Port Erin Closed Area	Sea Fisheries (Experimental Area) Byelaws 2006 (I) & Amendments in 2007 (II), 2009 (III).	1989 (extended in 2003 + 2006, + 2014)	Fishing with towed gear not permitted Scallop Closed Area	4 km^2	0.1
Douglas Bay Closed Area	Sea Fisheries (Douglas Bay Closed Area) Byelaws 2008	2008	Fishing with towed gear not permitted. Scallop Closed Area	4.5 km^2	0.1
Niarbyl Restricted Area	Sea Fisheries (Scallop Ranching) (Restricted Area) Byelaws 2009	2009	Not permitted to fish Queen or Great scallops without specific permission	6 km^2	0.15
Laxey Restricted Area	Sea Fisheries (Scallop Ranching) (Restricted Area) Byelaws 2009	2009	Not permitted to fish Queen or Great scallops without specific permission	4 km^2	0.1

Ramsey Marine Nature Reserve	Wildlife Act - Ramsey Bay (Marine Nature Reserve) No. 2 Byelaws 2011	2011	Zoned protection. See individual zone restrictions, but essentially no mobile gear allowed (with exception of permitted activity by MFPO)	94.4 km2	2.1
Baie ny Carrickey Closed Area	Sea Fisheries (Baie ny Carrickey Closed Area) Byelaws 2012	2012	No taking of any Great Scallops or Queen scallops by any means	11 km^2	0.2
Total				**123.9 km^2**	**3.1**

7.4 Brief rationale of this zonation in terms of the respective functions of the biosphere reserve. If a different type of zonation also exists indicate how it can coexist with the requirements of the biosphere reserve zonation.
(e.g., if national criteria exist for the definition of the area or zones, please provide brief information about these).

The following Guide was used to inform partners and interested parties about the overall UNESCO biosphere reserve concept, reiterating that the Isle of Man remains in control of legal powers over land and marine management. It was also relevant to emphasise the concept promotes innovative approaches to sustainable development.

Figure 3: Guide to management actives foreseen for Zones



Suggested Biosphere Zonation guide for appropriate uses per zone

UNESCO Man and the Biosphere programme emphasise there are no additional requirements. The whole concept is about promoting innovative approaches to sustainable development.

Suggested zonation criteria:
1 means existing and new actions allowable and encouraged;
2 means activities allowable if undertaken responsibly, (in line with current Codes of Practice)
3 low-level of activity allowable but generally best not in this zone.
- activity not typically carried out.

Management activities	Core	Buffer (Care)	Transition (Sustainable Development)
Conservation:			
Legal or equivalent status for zone	1	-	-
Conserve Biodiversity	1	2	3
Monitoring	1	1	1
Non-invasive research	2	1	1
Logistics/Research/Education:			
Non-invasive education	1	1	1
Environmental education	2	1	1
Basic/applied research	2	1	1
Development:			
Tourism	2*	1	1
Recreation	2	1	1
Low-intensity Agriculture	2#	1	1
Agriculture	3	2	1
Sustainable forestry	-	1	1
Small settlements	-	1	1
Towns and Villages	-	-	1
Territorial Waters & Fisheries^	3	1	1

(Equivalent status to mean protected by virtue of ownership by a body with key interest in maintaining sites nature conservation/ cultural/heritage interest.)

Note: all conservation activities could/should be encouraged throughout the Isle of Man, not just in core areas, to assist moves towards envt sustainability

*Encourage eco/culture/heritage-tourism

#Farmed land may also be ASSI (Core) area with mgt agreements

^ Ramsey Marine Nature Reserve and Managed Bays would be regarded as Core areas. 0-3 nautical miles, due to efforts to manage more sustainably, regarded as Buffer areas.

CORE

Land - The core is made up of areas given statutory designation under the Wildlife Act 1990.

The core areas of a biosphere reserve must be legally designated, hence the use of areas already in statutory designation. These are all biological sites as no geological sites have yet been designated. Designation criteria exist for ASSIs, NNRs and MNRs and the Calf of Man Bird Observatory. These are based on the criteria for nature conservation in Great Britain described and promulgated in 1977.

Marine - The marine core areas include the highly protected parts of the Marine Nature Reserve designated under the Wildlife Act 1990 and areas which have been closed or have restricted access under the Sea Fisheries Act 2012.

BUFFER

Land - The terrestrial buffer zone outside statutorily protected land comprises all land outside the core and urban areas. This comprises Manx National Heritage lands, Manx Wildlife Trust lands, uplands, farmland, glens, plantations, Registered Tree Areas, public footpaths and other recreation zones.

Land in the buffer zone protects core areas from intensive production and encourages activity that is compatible with conservation. On land, this is in "good management" through the participation of farmers in the Countryside Care Scheme (re-named Agricultural Development Scheme in 2015), involving cross compliance with Good Agricultural and Environmental Condition, statutory management requirements and other voluntary codes.

Marine – Outside the core areas, the area of sea out to 3 nautical miles (5.6km). This area, in which sustainable management techniques are developed and encouraged, is under the full control of the Isle of Man Government.

TRANSITION

The transition zone is where sustainable development is fostered by government, businesses and local people, if possible with highly innovative and participative governance systems.

On land, this is defined as the urban areas, and other man-made surfaces such as buildings and industrial estates.

In the marine environment, the transition area is the 3-12 nautical mile zone where fishing activity is managed by the Isle of Man Government in conjunction with other surrounding jurisdictions. Marine Consenting and Spatial Planning are managed by the Department of Infrastructure.

8. BIOGEOGRAPHICAL REGION:
[Indicate the generally accepted name of the biogeographical region in which the proposed biosphere reserve is located.]
(The term "major biogeographic region" is not strictly defined but you may wish to refer to the Udvardy classification system (http://www.unep-wcmc.org/udvardys-biogeographical-provinces-1975_745.html)).

The Isle of Man falls within the Western Palaearctic biogeographic region. Before people arrived after the last Ice Age (10,000 years ago), the main vegetation type would have been temperate broadleaf woodland, with upland heather moorland and arctic alpine vegetation above the tree line. Even parts of the coast would have had some wooded vegetation, remnants of which exist today on the cliffs. It is similar to other biosphere reserves in the British Isles, such as North Devon and Dyfi, which are described as 'Temperate Coastal/ Marine Zone' with notably mild wet winters and cool wet summers, due to the oceanic influence.

9. LAND USE:
The main land uses are, in order of greatest extent:
• agricultural land (grazed and cultivated),
• semi-natural habitat (often grazed),
• plantation (mainly introduced conifers),
• built up land (town and villages),
• amenity grassland (football pitches, golf courses, parks and extensive gardens).

Figure 4: land use types

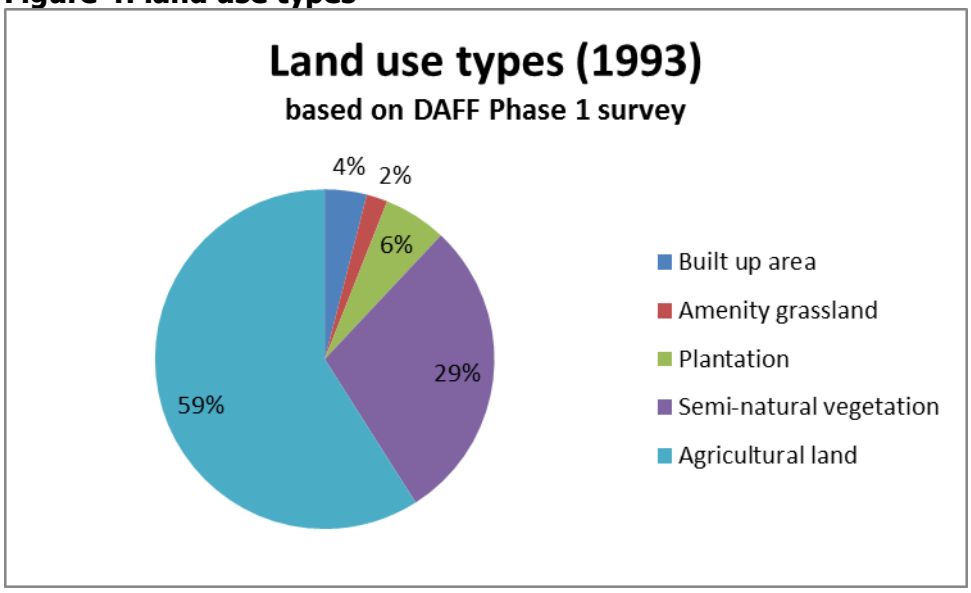
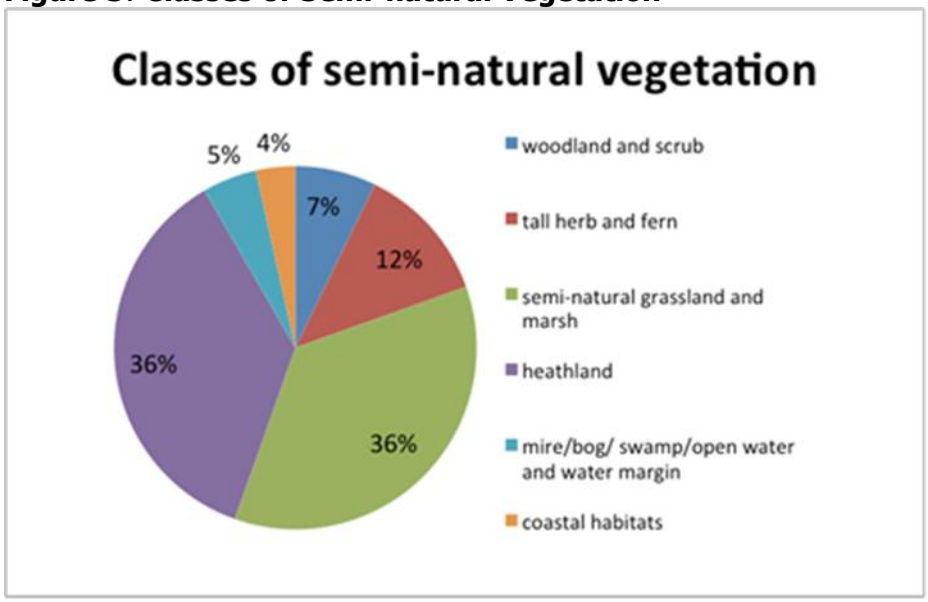


Figure 5: **Classes of Semi-natural Vegetation**



Please also note, 87% of the Island's territory is marine hence this section also refers to marine use.

9.1 Historical:
(If known, give a brief summary of past/historical land use(s), resource uses and landscape dynamics of each zone of the proposed biosphere reserve).

The Rural Landscape

The Island's landscape is a rich source of evidence of prehistoric and historical land use. On the surface, this survives as an intricate pattern of landholding and field boundaries, and in vegetation characteristic of different historical and contemporary land uses. Below ground is a rich archaeological heritage preserving evidence of 10,000 years of human activity alongside ancient environmental evidence – pollen and other plant remains preserved in peats – which provide a detailed record of early vegetation history. The two suites of evidence – above and below ground – are intimately connected, and should be seen and understood as a continuum.

Agricultural landholding on the Isle of Man has until recent decades been associated with a generally conservative and traditional farming industry, and is based on a system of land division which was already well-established when first documented at the beginning of the 16th century. These early written sources, and the place names still preserved in the Manx landscape, indicate that the system of dividing and holding land is at least as old as the medieval period and stands comparison with some of the other areas colonised by the Norse Vikings, for instance in the Western Isles of Scotland.

On the Island, it is clear that the primary farm units were historically defined by reference to the local topography, and particularly to watercourses and watersheds. Across much of the Island, this allows quite equitable division of land of varying quality between different historical landholdings, resulting in a fair distribution of landscape resources, access to the sea, and entry onto the upland common for grazing.

Early Manx laws required farms to establish boundary earthworks, giving rise to the characteristic Manx 'sod hedge'. These banks of earth, turf and stone, sometimes topped with gorse, were intended to be stock-proof barriers protecting each landholding from its neighbour and from animals wandering from the upland common; the 'mountain hedge' between farms and the uplands is often a particularly substantial feature of the landscape. The mountain hedge usually marks a change in vegetation from agricultural to uncultivated and, from a distance in August, the transition from green field to purple moor is remarkable.

The mountain hedge was not a fixed feature and was realigned when additional land was taken in for agriculture or abandoned as uneconomic. On some hillsides, this has created an interesting mosaic of vegetation reflecting the gradual desertion of marginal farms from the medieval period down to the mid-20th century; recent discoveries of a small number of 13th and 14th century farmsteads demonstrate the importance and potential of this marginal landscape. Higher up the hillsides are the remains of hut settlements used seasonally during the medieval period; livestock was grazed on common land whilst crops ripened and were harvested in the fields below.

Each landholding is subdivided into individual fields, whose size varies according to slope, aspect and use. Many farms still retain their old field patterns: only a very few adopted the efficiencies afforded by regular, chequerboard patterns promoted by agricultural improvers in the early 19th century, and only a few modern farmers have grubbed out boundaries. The result is a landscape dominated by quite small fields, divided by banks and hedges whose varied vegetation supports a rich range of wildlife. The only exception is on the margins of the hill-land, where 19th century deforestation has led to the construction of miles of stone walls associated with the introduction of intensified sheep farming.

The far north of the Island presents a contrasting landscape which results from a much more recent geological history. Wholly created after the last Ice Age, this low-lying plain is now extensively farmed, but still retains much of its old field patterns. Extensive drainage schemes from the late medieval period onwards have brought more land under cultivation, though more intractable wetland centred on the Ballaugh Curragh Ramsar Site has partially reverted to its former state, as have marginal enclosures made on the thin sandy soils on the Ayres along the north coast.

Settlement and Communications

The Island's major historical settlements – Douglas, Ramsey, Peel, and Castletown – are all located around the coastline, their origins associated with military, fishing and merchant activity from the medieval period onwards. There are comparatively fewer significant inland settlements and, where these exist, they have tended to spring up around fords and bridges.

Whilst a few longer-distance routes seem to have exploited the open hill-land to speed travel from the north to the south of the Island, most traffic would have historically gone by sea, until road-building became a preoccupation in the 18th century. Until then, most land-based communication was on a local level and relied on narrow trackways within,

rather than between, farms. These provided access between fields, to upland pasture and turbaries (areas where rights were given to extract peat for heating purposes) and down to the shore.

Modern roads have followed where these tracks persisted and developed into rights of way in public use for going to church, moving stock to the common, or fishing from navigable beaches. Occasionally, newer roads have been required for practical or economic reasons, and these, like the Victorian rail and tram networks built to serve a growing 19th century tourism industry, cut intrusively across older field patterns.

Terrestrial

The terrestrial core areas are mainly subject to traditional agricultural use through extensive grazing of uplands and lowland grassland for conservation management, by Manx Wildlife Trust and Manx National Heritage and private farmers and landowners – with the two often working together in partnership.

A large area of the terrestrial buffer zone is government-owned and -tenanted upland, which is mostly farmed by extensive sheep grazing. Moorland management is also undertaken by grouse shooting tenants.

Marine

The main natural resource of the marine environment is for local commercial fisheries, in addition to recreational sea-fishing, boating and water sports. As of 2012, the ports of Ramsey, Peel, Douglas, Castletown and Port St Mary harbour a fleet of 69 registered commercial fishing vessels, which are mostly small inshore day boats. Fishing vessels from other jurisdictions can also fish in Isle of Man waters, provided they follow Isle of Man Sea fisheries legislation.

The main fishery species are (in order of economic importance: see Table 6): king scallops (*Pecten maximus*), queen scallops (*Aequipecten opercularis*), lobster (*Homarus gammarus*), crab (*Cancer pagerus*) and whelk (*Buccinum undatum*). King scallops (Pecten maximus), are caught mainly using toothed dredges, queen scallops (*Aequipecten opercularis*), mainly using trawls and lobster (*Homarus gammarus),* crab (*Cancer pagerus*) and whelk (*Buccinum undatum*) using pots.

Table 6: Value of fisheries

Fishery	**Value to Isle of Man (year 2013)**
King scallops	£3,180,000
Queen scallops	£2,480,000
Crab	£490,000
Lobster	£440,000
Whelks	£350,000
White fish	£26,000

There are many recreational boat users who largely keep their boats in Port St Mary, Ramsey, Peel and Douglas. Peel and Douglas have water retention schemes maintaining the water levels in the inner harbour areas.

9.2 Who are the main users of the biosphere reserve? (for each zone, and main resources used). If applicable, describe the level of involvement of indigenous people taking into account the "United Nations Declaration on the Rights of Indigenous Peoples".
(http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf).

Terrestrial core areas
The terrestrial core areas are ASSIs, which are a mix of public and private land. Many are farmed. Some are "open access" to the public for recreation; some sites receive many visitors each year (Ballaugh Curragh, the Calf and the Ayres). MNH and MWT land receives visitors and is actively managed for biodiversity, sometimes by grazing and other active management.

Marine core areas
The Marine Nature Reserve is subject to normal leisure boat and recreational fishing use, but use by commercial fishermen with dredges and trawls is not permitted.

Marine Buffer zone
The marine buffer zone comprises the 0-3 nautical mile zone round the Island outside of Marine Core areas (below mean high water mark) has been agreed as buffer with the Manx Fish Producer's Organisation. This represents 68,107 ha of the marine area). This is protected through the fisheries regulation and legislation. This area is considered large enough to ensure the long-term conservation of all its features.

Terrestrial buffer zones
Outdoor recreation visits by the local population, as well as tourists/visitors to the area, is the other significant use of the rural environment. Much of the terrestrial buffer zone is government-owned upland. In 2011, DEFA estimated that people made 200,000 recreational visits a year to the hills.

Access is centred on the extensive network of public rights of way. The best known are the Millennium Way, the Way of the Seagull (*Raad ny Foillan*), the Way of the Herring (*Bayr ny Skeddan*). The Raad ny Foillan is approximately 95 miles (153 kilometres) of footpath around the Island's coast. The Millennium Way was established in 1979 to celebrate the Millennium year of Tynwald. It runs 28 miles (45 kilometres) through the heart of the Island from Sky Hill near Ramsey in the north to Castletown in the south, covering both roads and open moorland. The Bayr ny Skeddan runs 14 miles (22 kilometres) from Castletown to Peel. It is so called because it was once the route taken by Manx fishermen between the two ports. The Heritage Trail is a 10.5 mile (17 kilometre) walk from Douglas to Peel along the former Isle of Man Railway company line.

There are many miles of ancient 'unmade roads' in the Isle of Man. They are rights of way through the countryside, not just for walkers but also for other users

including mountain bikes, horses and motorcycles. These roads are known as 'green lanes' but some are classified as 'Greenway Roads' on which vehicles are restricted. http://www.gov.im/categories/travel-traffic-and-motoring/greenlanes/greenway-roads-list/

The deciduous Manx National Glens, largely planted in the late 19th Century for the booming tourism industry of the time are believed to attract 500,000 visits a year (2011 figures from DEFA). https://www.gov.im/categories/leisure-and-entertainment/walking/national-glens/ The main forms of recreation are walking, running and off-road mountain-biking, as well as horse riding.

Inclusion of these routes is consistent with Madrid Action Plan Target 14: Connectivity between elements in the landscape, to provide linkages from urban to more rural areas.

Terrestrial transition areas
The terrestrial transition area(s) of the near-continuous coastal urban settlements of Douglas and Onchan, together with Peel, Ramsey, Laxey, Port Erin, Port St Mary and Castletown, are the focus of most human activity, covering a whole spectrum of domestic, business and leisure uses. The main users of these areas are the approximately 60,500 urban residents (2011 census) and 220,000 annual visitors and 5,000 day visitors (2013). They principally use the resource of space for housing, transport, retail and recreation, in addition to the daily human needs of food, water (mainly from the upland catchments), waste and other resources.

Marine transition area
This is subject to many different uses:

- Cables
- Pipelines
- Shipping
- Commercial fishing (trawling and dredging)
- Leisure fishing
- Yachting
- Other recreational use
- Disposal of wastes (whey, treated sewage, harbour dredgings)

9.3 What are the rules (including customary or traditional) of land use in and access to each zone of the biosphere reserve?

Public access is covered in 9.2 above.

The future development of the Isle of Man is guided by the Island Development Plan. This consists of an all Island Strategic Plan and more local Area Plans.

The overarching strategic aim of the current Island Strategic Plan (approved in 2007) is to "*plan for the efficient and effective provision of services and infrastructure to direct and control development and the use of land to meet the community's needs, having particular regard to the principles of sustainability whilst at the same time preserving, protecting, and improving the quality of the environment, having particular regard to our uniquely Manx natural, wildlife, cultural and built heritage*".

All the Policies within the Strategic Plan and all the allocations of land for development within the Area Plans are prepared to meet with this overarching aim. In this way the development of the Isle of Man is consistent with the principles of sustainable development.

When preparing the Island Development Plan, there is a co-ordinated input from across the Isle of Man Government to ensure that future development is located in areas which are accessible by means other than the private car, are not within areas of known flood risk and taking into account the environment of the Island. This means that, in most cases, development is directed to be within or closely adjacent to the existing settlements of the Island.

The open countryside is protected for its own sake, meaning that there is a presumption against development in such areas. Sites across the Island that have been granted statutory protection area afforded the highest level of protection.

The core areas include nationally designated statutory Areas of Special Scientific Interest (ASSI) (including a Wetland of International Importance and a National Nature Reserve) and thus their land use (mostly agriculture by private landowners) is primarily regulated by the Department of the Environment, Food and Agriculture through approved management agreements and consents restricting "operations likely to damage the special interest". Public access and non-damaging activities are permitted in those ASSIs that are open to access and/or managed by organisations in the public interest. Agricultural land in the core areas is also subject to Countryside Care Scheme cross-compliance rules.

Buffer zones

Much of the agricultural land in the buffer zones is also subject to Countryside Care Scheme (equivalent to the Single Farm Payment in UK, and renamed in 2015 to Agricultural Development Scheme) cross-compliance rules. Landowners have been provided with the UNESCO Biosphere Isle of Man Voluntary Code of Practice for Landowners/managers (attached in Appendix 4). This voluntary Code is based on existing requirements affecting landowners, being Statutory Requirements, CCS Requirements (renamed in 2015 to Agricultural Development Scheme - ADS) and Voluntary measures such as the Voluntary Water, Waste, Hedge Management and Cushag Codes of Practice. Cushag is the Manx name for Ragwort (*Jacobaea vulgaris*).

Transition zone
Agricultural land in the transition zone is also subject to Countryside Care Scheme (now ADS) cross-compliance rules.

9.4 Describe women's and men's different levels of access to and control over resources.
(Do men and women use the same resources differently (e.g., for subsistence, market, religious/ritual purposes), or use different resources?).

Currently, a small proportion of the population (1%) is directly employed in using or managing natural resources, for example through farming and fishing. These industries, especially fishing, remain male-dominated. There is a slow but increasing trend of female involvement, and a Lady Farmers Group has been established. Women in Britain are traditionally employed more in the service sector, particularly retail and tourism. However, the finance sector, previously male-dominated, has increased female representation.

Table 3: Resident population by gender and employment status

3.1 RESIDENT POPULATION AGED 16 AND OVER BY SEX AND EMPLOYMENT STATUS 2011

	Male	Female	Total
Economically Active	24,033	20,576	44,609
of which:			
Works for an employer full-time	16,812	12,305	29,117
Works for an employer part-time	1,547	5,638	7,185
Works for more than one employer	224	508	732
Self-employed employing others	1,330	487	1,817
Self-employed not employing others	3,780	1,578	5,358
Unemployed and looking for work	907	568	1,475
Not in work and not looking for work	10,747	15,012	25,759
of which:			
Unable to work due to long term sickness	635	494	1,129
Unable to work due to disability	453	364	817
Retired	6,829	9,418	16,247
At school or in full-time education	1,211	1,205	2,416
Looks after home or family	176	2,481	2,657
Other	536	482	1,018
Total	**34,780**	**35,588**	**70,368**

Note: Figures collected in the 2011 Census of the Isle of Man population.
Source: Treasury

There is a need to address the gender balance amongst those governing the Island in Tynwald. Although the President of Tynwald is currently a woman, she is one of only three women among the 35 members of the Tynwald Court (8.6%).

10. HUMAN POPULATION OF PROPOSED BIOSPHERE RESERVE:
[Approximate number of people living within the proposed biosphere reserve]

Table 4: Population by BR Area(s)

	Permanently	Seasonally
10.1 Core Area(s)	___0____	__2_____ (Calf of Man

		Observatory)
10.2 Buffer Zone(s)	____24,087___	291,300
10.3 Transition Area(s)	60,410	
Total:	**84,497 (2011 Census)**	**225,000 recreational visitors and 66,300 business visitors**

10.4 Brief description of local communities living within or near the proposed biosphere reserve.
(Indicate ethnic origin and composition, minorities etc., main economic activities (e.g. pastoralism, tourism) and the location of their main areas of concentration, with reference to the map (section 6.2)).

Table 5: Ethnic origin/Country of birth (from 2011 census)

Country of birth	**Percentage of population in 2011**
Isle of Man	48.1
England	35.9
Scotland	3.2
Other Europe (EU)	2.4
Northern Ireland	2.0
Asia	2.0
Republic of Ireland	1.9
Africa	1.5
Wales	1.1
America (incl. Caribbean)	0.6
Other Europe (non-EU)	0.5
Australasia	0.3
Channel Islands	0.2
Middle East	0.1

Table 6: Main economic activities (from 2011 census)

Industrial sector	**% of employment in 2011**
Insurance, banking, finance and business services	22
Professional, educational, medical and scientific services	20
Construction	8
Retail distribution.	8
Miscellaneous services	8
Transport and communication	7
Public administration	7
Manufacturing	5
Other catering and entertainment	5
Agriculture, forestry, fishing	2

Utilities (gas, electricity and water)	2
Wholesale distribution,	2
Tourist accommodation,	2
Information and communications technology sector	<1
Other	1

Though generating only around 1% of income to the economy, the Isle of Man's mixed farming industry accounts for some 80% of land use.

Table 7: Isle of Man Population by town/village as taken from the 2011 Census Report

Town/Village	Females	Males	Total
Douglas	13,918	14,020	27,938
Ramsey	3987	3834	7821
Peel	2568	2525	5093
Castletown	1549	1548	3097
Port Erin	1823	1707	3530
Port St Mary	1007	946	1953
Laxey	826	879	1705
Onchan	4736	4537	9273
Total Population within the main settlements			**60,410**
Remaining Population not within the main settlements*			**24,087**

*There are other settlements within this figure but the precise population numbers of these settlements cannot be calculated from the published census data.

10.5 Name(s) of the major settlement(s) within and near the proposed biosphere reserve with reference to the map (section 6.2):

The major settlements are Douglas/Onchan, Ramsey, Peel, Port Erin/Port St Mary, Castletown and Laxey, with over 70% of the population.

10.6 Cultural significance:

(Briefly describe the proposed biosphere reserve's importance in terms of past and current cultural values (religious, historical, political, social, ethnological) and others, if possible with distinction between material and intangible heritage (c.f. UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage 1972 and UNESCO Convention for the Safeguard of the Intangible Cultural Heritage 2003

Land Use – History and Culture

The Island is rich in natural beauty, biodiversity and cultural heritage, and has a strong farming and maritime tradition. All these contribute to the Manx people's powerful sense of identity. There has been human habitation here for much of the 10,000 years since the last Ice Age. The culture has strong Celtic and Viking influences. The Island is governed by its own parliamentary assembly and legislative body, Tynwald, which is thought to be the oldest continuous parliament

in the world. This adds to Manx distinctiveness and independence of character. The national symbol of the Isle of Man is a triskele of three legs and its motto: " *Quocunque jeceris stabit* ("Whichsoever way you throw it, it will stand"). This expression of Manx resilience is regarded as symbolizing the adaptability of the Manx people to changes in circumstances.

All periods of prehistory and history are represented, from 10,000 years ago to the present, with the notable exception that no Roman activity has been recorded.

The Island was colonised as the climate ameliorated following the Ice Age around 10,000 years ago, at a time when low sea-levels would have facilitated movement across the Irish Sea basin. Until recently, this activity was almost solely represented by worked flints characteristic of the period, but more substantial remains, including domestic structures, have now been found (for instance at Ronaldsway). The population subsisted on the natural resources of the land and sea. This period is known as the Mesolithic (c. 10,000 – 6,000 years Before Present).

It is also notable that research in the Isle of Man has been able to identify sites among the earliest known locations in the British Isles in the transition from Mesolithic hunter-gatherer foraging to Neolithic farming economies with cereal cultivation at almost 6000 years BP.

During the Neolithic period (c. 6,000 – 4,000 years BP), the Island, by now fully isolated by the sea, was home to a population capable of sea travel and sufficiently organised to build substantial communal tombs, several of which survive (for example, Cashtal yn Ard, King Orry's Grave). Their massive construction implies a population which was capable of supporting itself through agriculture sufficient to produce substantial surpluses of time, energy and wealth and able to communicate and exchange ideas, technology and goods across the sea to neighbouring lands. There is also widespread evidence for settlement, the production of worked flint and stone tools, and the manufacture of pottery. Recent archaeological excavations at Ronaldsway provide evidence of occupation circa 10,000 years ago, with Mesolithic flint and the charred remains of a 6 metre diameter circular structure.

In the Bronze Age (c. 4,000 – 2,500 years BP), new technology saw the introduction of copper and bronze, which was used in the manufacture of tools and weapons. The widespread survival of burial mounds shows that the construction of monuments to the dead continued to play a significant role in Bronze Age society. These monuments express a longstanding link between a community and the land they occupy and, combined with the later construction of a large hill fort on South Barrule, hint at a growing sense of territoriality and the potential for disputes and warfare. A worsening climate during the period may have contributed to such unrest. As well as burial monuments and defensible sites, settlement evidence is widespread in all parts of the Island's landscapes – coastal, lowland and upland – as are finds of pottery and flint tools which continued in use alongside the newer metal technology.

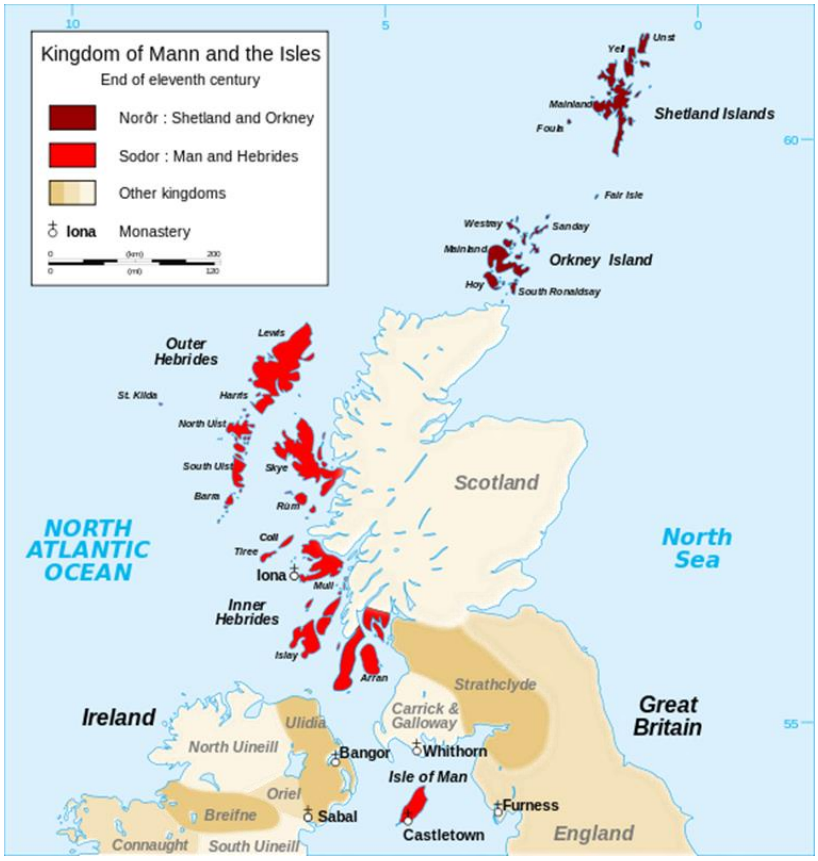
The Bronze Age was followed by a 'long' Iron Age (c. 2,500 – 1,200 years BP) which was uninterrupted by Roman invasion and lasted through the introduction of Christianity until settlement by Vikings in the early 10th century. Recent excavations at Ronaldsway may

be central to understanding the transition from the Bronze to the Iron Age, but evidence for this long period in recent prehistory is quite limited. A large number of coastal promontories were at some point occupied defensibly, suggesting concern over seaborne attack, whilst refuge was also sought inland on sites protected by marshes. Later Celtic influences can be seen in the development of a number of hill and promontory forts around the Island. Like Anglesey (Ynys Mon) on the welsh coast opposite, the Isle of Man may have been a stronghold of druidic culture at that time. Finds of imported goods, especially metal and pottery, show that contact was maintained with Roman and post-Roman Britain, but this was never at a level which implies even temporary occupation by the Roman Empire. Christianity was certainly present by the 6th century.

The beginning of the medieval and Post-Medieval periods (c. 800 – 1750) sees trade around the Irish Sea coming under increasing Scandinavian influence, and is brought into sharp focus by a series of pagan Viking burials, usually in prominent coastal locations, which represent the first generation to settle on the Island around 900 years ago. These incomers were rapidly converted to Christianity and thereafter exerted significant cultural influence on the indigenous population, leading to a new system of government, landholding, and even a change in building technique, which saw the circular buildings of the Bronze and Iron Ages replaced with rectangular structures, several examples of which survive to the present day.

From the early 9th century, the Isle of Man was subject to Norse Viking incursions. More stable Viking rule came to the Island in 1079 when Godred Crovan established the "Kingdom of Mann and the Isles" which included the Hebridean islands, the Kintyre peninsula and associated islands.

Figure 6: The Kingdom of Mann and the Isles
From http://en.wikipedia.org/wiki/Kingdom_of_the_Isles



Fortified strongholds were developed in Castletown (Castle Rushen) and Peel (Peel Castle) during this period. The Viking influence continued into the 13th century, so there was little to no direct cultural impact from Norman England.

The Manx parliament, Tynwald, appears to have been formalised during the 9th century. This is recounted in the "Chronicles of the Kings of Mann and the Isles", believed to have been written by Cistercian monks associated with Rushen Abbey in 1257. Tynwald has continued since that time and is the world's longest-established continuous legislative assembly.

The Island was vital to the strategic and political interests of a dynasty of Norse kings until 1265. Following the defeat of Vikings in the 13th century by Alexander III of Scotland, the Isle of Man came under Scottish rule for a brief period and changed hands between Scotland and England until it was taken into the possession of the English Crown in 1399 by Henry IV. He granted it to the Stanley family in 1405. Ownership of the Island reverted to the Crown after the British Isle of Man Purchase Act (Act of Revestment) in 1765. The Island is now an independent Crown Dependency. The principal effect of this outside control, and the way it was exerted, was to decelerate change and to preserve an unusually rich cultural and historic landscape.

The modern era (1765 - present) has seen substantial expansion of the principal settlements, particularly Douglas, which grew first as a commercial and then a tourism centre, becoming the Island's capital in 1869, and is now home to the Island's financial industry. Residential growth has also changed the face of many of the Island's smaller

inland settlements. Beyond, the agricultural community, which has a strong sense of guardianship of the countryside, has done much to maintain the landscape already described.

The Island's geology includes mineral ore deposits which were rich in lead with some copper, iron, silver and zinc. Although these ores have been mined since prehistoric times, there was significant production during the 19th century. The Great Laxey Mine was worked for over 150 years until its closure in 1929. Annual production reached its peak in the 1870s with 2,500 tons of lead and silver, 9,000 tons of zinc and an average of 500 tons of copper. The largest water wheel in the world, the "Lady Isabella", erected to assist in pumping out the mine, is a major tourist attraction in Laxey. Disused mines and adits are integral to the Island's cultural legacy. The mining landscape has been softened by vegetation, in several places providing an habitat for specialised plants e.g. moonwort (*Botrychium lunaria*) and adder's tongue fern (O*phioglossum vulgatum*), more common plants with genotypes allowing them to live on soils with high concentrations of heavy metals (*Calluna vulgaris*, *Agrostis* spp.), and various bat species.

The Island has a strong maritime tradition. Manx seafarers have made significant contributions to global maritime events and activities, including the North Atlantic Slave Trade; and the mutiny on the Bounty (1789); the Battle of Trafalgar (1805); the American War of Independence and subsequent American Civil War; smuggling (the "Running Trade"); and naval engagements during WW1 and WW2. The Isle of Man has always maintained a fishing fleet, which together with a strong farming community has helped in ensuring a degree of security of food supply for its population so that the island was not subject to the same pressures as led to the Irish Potato Famine and the Scottish Highland Clearances.

During the 17th to mid-19th century, the Isle of Man was frequented by visitors touring the British Isles, especially as the fashion developed for exploring wilder landscapes. Some of the 17 National Glens were developed initially as tourist attractions with 'pleasure garden' elements such as a water-powered roundabout in Silverdale Glen. As the boom in tourism waned, intensively managed broadleaved woodland was allowed to mature and become wild, and the glens are now popular places to appreciate wildlife as well as for outdoor recreation.

The development of the railways in England from the 1830s, linking with passenger vessels, led to an influx of summer visitors. The introduction of a rail network on the Island itself, during the latter part of the 19th century, allowed these visitors to more easily explore beyond Douglas. At its height, there were regularly in excess of 500,000 visitors each summer. Tourism was punctuated by both World Wars and although followed by brief recoveries, visitor numbers have steadily declined since then as a result of low-cost holidays in southern Europe. Apart from visitors coming to the Island to see family and friends, tourism is now segmented into a variety of specialist markets. The main one is associated with motorsport – especially the annual Tourist Trophy (T.T.) motorcycle races which bring visitors from all over the world. Some of the railway and all the tramway systems remain and, along with other 19th century industrial heritage such as the Laxey Wheel, they still provide an attraction for today's visitors. Many visitors now cite the coast as a prime attraction. Disused railway tracks are popular walking

trails, and provide excellent green infrastructure, enabling ecological connectivity around the Island.

The Island's religious traditions have largely mirrored the experience of the UK mainland with the conversion to Christianity during the Viking period, the establishment of Rushen Abbey and other monastic institutions during the Middle Ages, the dissolution of the monasteries in the 16th century, and the development of non-conformist religion (especially Methodism) during the 18th and 19th centuries. There remains a strong element of traditional folk-lore on the Island, which undoubtedly traces its roots to Celtic and pre-Christian Viking times. Manx carved stone crosses dating from the 9th – 11th centuries portray evidence of the early introduction of Christianity.

Music and dance on the Island have traditionally been influenced by a combination of Celtic folklore and Christian ritual, and there remains a strong Celtic influence on the current music scene, with Island musicians and dancers performing in pan-Celtic festivals. More modern influences ranging from "Blues" to "Classical" are also well-represented. These, together with the visual arts and theatre have been showcased during the 2014 "Island of Culture" programme of events and exhibitions.

Other factors affecting the cultural development of the Island include the use of the Island for interning "enemy aliens" during both World Wars. Its more recent role as an offshore finance centre also attracts attention from governments and international organisations with an interest in international finance and taxation. Largely in support of the finance sector, the Isle of Man Government also encourages local companies to be at the forefront of ICT developments.

The cultural significance of the Isle of Man is given effect not only by its relative isolation as an island in the Irish Sea but also by its close proximity to England, Northern Ireland, Scotland, Wales and the Republic of Ireland. The cultural identity of people now resident of the Island is coloured by these historical connections together with the more recent impact of people migrating from elsewhere in Europe and worldwide to find employment in the Island's finance, catering and hospitality, health, IT and other sectors.

The policies of the current government focus strongly on issues relating to sustainable development and security of food supply, and reflect a strong local desire to look after the rural landscape as a crucial element of the Island's 'quality of life'.

10.7 Specify the number of spoken and written languages (including ethnic, minority and endangered languages) in the biosphere reserve.
(Refer, for instance, to the UNESCO Atlas of Endangered Languages (http://www.unesco.org/culture/languages-atlas/index.php)).

Since Celtic times, Manx people have spoken a variety of Gaelic. Manx Gaelic is one of six Celtic languages (the others being Irish, Scots Gaelic, Welsh, Breton and Cornish). The orthography for written Manx Gaelic was first developed in the 17th century by John Phillips, Bishop of Sodor and Man. The use of the language began to die out in the 19th century and recordings were made of the last native speakers in the late 1940s and early 1950s. Since then, a number of attempts have been made to revive and continue the tradition of spoken and written Manx Gaelic.

English is the first language of the vast majority of people on the Isle of Man. However, there are at least eight other languages currently known to be spoken and written on the island. 12.72% of Youth Survey respondents (1500 sample size, almost 10% of the total population of children and young people) use a language other than English outside of school on a regular basis.

Of these:

8.7% speak Manx (the Isle of Man's native language)

8.7% speak French

7.5% speak Filipino

5.93% speak Tagalog

5.53% speak Spanish

4.74% speak Polish

4.35% speak German

54.5% speak a language different from any of the above.

According to the 2011 national census, Manx-born residents account for 48.1% of the population. However, only a total of 1,823 (just over 2%) of the population could speak, read or write Manx Gaelic. 71 children currently attend Bunscoill Ghaelgagh in St Johns in which all of their primary education is in Manx. There are approximately 1000 children in other schools on the island who also have Manx instruction. Culture Vannin (also known as the Manx Heritage Foundation) currently have around 100 adults on the adult Manx language programme.

Manx is described as "critically endangered" in the UNESCO Atlas of Endangered Languages, since 2009.

11. BIOPHYSICAL CHARACTERISTICS:

11.1 General description of site characteristics and topography of area:

(Briefly describe the major topographic features (wetlands, marshes, mountain ranges, dunes etc.) which most typically characterize the landscape of the area).

The Island has a great diversity of landscapes. The hills are mainly covered with heather (*Calluna vulgaris*) moorland and upland grassland with a fringe of bracken (*Pteridium aquilinum*), and wet rush (*Juncus* spp) pasture. The highest point is Snaefell rising to 621m above sea level. The hills make up about a quarter of the

land area and are divided by a central valley (between Douglas and Peel). The Sulby River is the island's longest watercourse, 16.9 km long. The northern coast is made up of soft cliffs of glacial moraine, sand dunes and shingle. This is the location of the Ayres National Nature Reserve, famous for lichen heath. Bride Hills are a line of glacial deposits, south of which wetlands have formed in basins under the edge of the hills. Ballaugh Curragh and Cranstal basin originated from dried out post-glacial lakes that, are now dominated by willow carr and bog. The soils of the Northern Plain are sandy, drier and good for arable crops, but there are abundant small man-made ponds or dubs and a drainage trench. Along the east side of the hills are several sheltered damp ravines or glens where relic ancient woodland and Victorian plantations are found by streams and waterfalls. There is a rich diversity of bryophytes, lichens and fungi. Further south, much of the farmland is pasture and still has a patchwork of small fields with earth banks (known as Manx sod hedges) or dry stone walls. The Island has 120 km of rocky coastline from Peel south round the Calf and up to Ramsey. These hard cliffs are mainly Manx slates, but with a short stretch of Carboniferous limestone around Castletown.

To the south is a small seasonally inhabited island, the Calf of Man, whose habitats mirror the mainland.

11.2 Altitudinal range:

11.2.1 Highest elevation above sea level: 621 metres

11.2.2 Lowest elevation above sea level: 0 metres

11.2.3 For coastal/marine areas, maximum depth below mean sea level: 150 metres

11.3 Climate:
(Briefly describe the climate of the area, you may wish to use the regional climate classification by Köppen as suggested by WMO (http://www.wmo.int/pages/themes/climate/understanding_climate.php).

Due to the influence of both the Atlantic Ocean and the surrounding Irish Sea, the Island's climate is maritime, often rather humid, mild/temperate or moderate and generally lacking in extremes. Winters are mostly mild, rather windy and often wet; snowfall and frost are infrequent. Even when snow does occur, it rarely lies on the ground for more than a day or two. February is normally the coldest month. Gales are frequent in the autumn and winter, which are also the wettest months. Sunshine hours are generally above average for this latitude.

The prevailing wind direction for most of the Island is from the Southwest, although the rugged topography means that local effects of shelter and exposure are very variable. In summer, April, May and June are the driest months whilst May, June and July are the sunniest. July and August are the warmest months. The highest temperature recorded at the Island's weather centre at Ronaldsway is 28.9°C. Thunderstorms are rare.
Although geographically small, there is climatic variation around the Island. Sea mist or fog affects the south and east coasts at times, especially in spring, but is

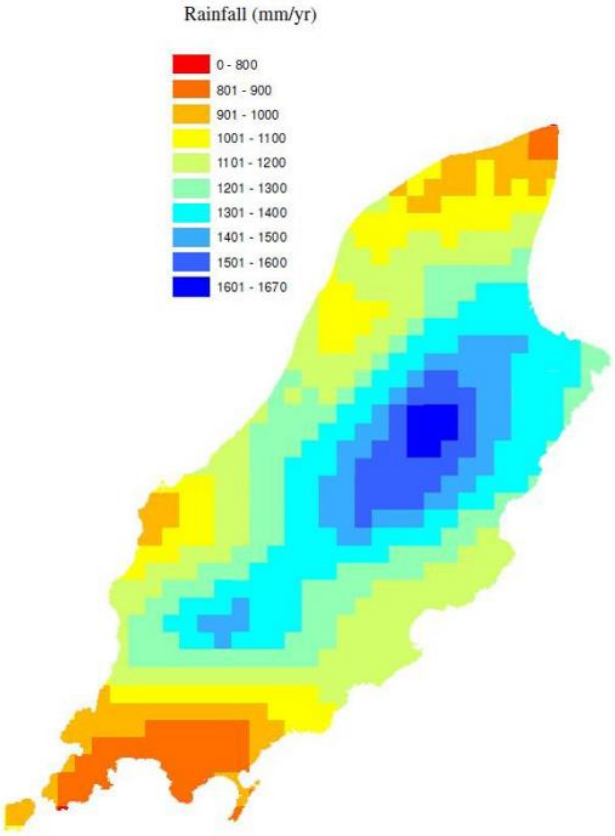
less frequent on the West coast. Rainfall (Figure 9) and the frequency of hill fog both increase with altitude, and temperatures drop by a few degrees. The highest point of the Island (Snaefell mountain, 621 m) receives some two and a quarter times more rainfall than the northern plain and the lowland in the south. At Ronaldsway, on the southeast coast, the mean annual precipitation is 864 mm.

11.3.1 Average temperature of the warmest month: July 15.2°C at Ronaldsway

11.3.2 Average temperature of the coldest month: February 5.7°C at Ronaldsway

11.3.3 Mean annual precipitation: 864.1mm recorded at Ronaldsway

Figure 7: Rainfall Distribution Map



11.3.4 If a meteorological station is in or near the proposed Biosphere Reserve, indicate the year since when climatic data have been recorded:

a) manually: **1947**
b) automatically: **2011**
c) Name and location of station: **Ronaldsway**

Ronaldsway Meteorological Station is at co-ordinates Lat. 54º 05' North, Long. 4º 38' West, and altitude 52ft (15.85 metres)above sea level. There are several other meteorological stations on the Isle of Man.

11.4 Geology, geomorphology, soils:
(Briefly describe important formations and conditions, including bedrock geology, sedimentary deposits, and important soil types).

Most of the Island is built up of layers of ancient mudstones and sandstones from the Ordovician/Silurian period, heavily deformed by continental collision long ago and in many places altered by both intrusive and extrusive volcanic rocks. Carboniferous Limestone occurs along the South coast and offshore; its 'ledges' form significant marine habitats. The Peel Sandstone occurs in a limited area on the West coast where it forms red cliffs with a very varied composition. The

Northern plain is composed of glacial tills, gravels and outwash sands with the remains of several pro-glacial lakes and a series of small glacial features that now form what are locally called 'dubs'. Large areas of impeded drainage caused the formation of extensive peat-filled wetland areas over the last 10,000 years and, although much of the peat land has been exploited for fuel and drained, significant areas of lowland peat remain.

Offshore, the sea bed also has a great variety of depths, substrates and current strengths. This diversity supports a wide range of marine biotopes which were surveyed in detail by Bangor University in association with DEFA in 2008.

South of the escarpment that marks the boundary of the periglacial deposits of the northern plain, the Isle of Man is underlain by Palaeozoic rocks, the oldest of which, the Manx Group, dominates the solid geology of the land mass and extend one to ten kilometres out from the North-West, South-West and whole of the East coast. Previously known as 'Manx slate', the Manx Group consists of sequences of sandstone, siltstone and mudstone originating in the Ordovician period 490 – 470 million years ago. At that time, deep-water marine sediments were being deposited along the northern edge of Avalonia, a 'micro-continent' lying close to the south polar continent of Gondwana. Mixed sediments eroded from the Avalonian landmass were periodically transported downslope in currents generated by underwater avalanches and subsequently settled out in fans of differentiated strata.

The Manx Group is probably between 1,000 and 3,000 metres thick. Though much faulted, the general trend is for tilting towards the north-west, resulting in the rocks becoming younger from east to west.

Until the 1990s, the Manx Group was thought to form the whole of the West coast south of Peel. However, graptolites found in 1997 confirmed that the coast between Niarbyl and Peel was formed of much younger rocks than those of the Manx Group and originated in the Wenlock epoch of the Silurian Period (428 – 423 million years ago).

The Dalby Group, whose rocks are also the product of turbidity currents, were generated by marine avalanches from the equatorial continent of Laurentia. Separating Laurentia and Avalonia was the Iapetus Ocean which gradually became smaller and smaller as tectonic forces moved the continental plates towards each other. By the time the Dalby Group was deposited, the two landmasses were probably separated by only a few hundred kilometres. Around 410 million years ago, in the Devonian period, they collided and the Iapetus Ocean was extinguished. The 'join' is at the Iapetus suture which lies under the sea and close to the North-West coast of the Isle of Man. Thus rocks exposed on the coast at Niarbyl represent two different continents once separated by thousands of kilometres of ocean. As the two plates pushed against each another, crustal movement crumpled the rocks, forming the Caledonian mountain chain which extended across North America to Scandinavia. The eroded remnants of this chain form the uplands of the Isle of Man today.

On the west side of the Island, red sandstones and conglomerates recently confirmed as of Devonian underlie Peel, its immediate area and the seabed for a short distance offshore to the north, where they may be as much as 2,000 metres thick. These are called the Peel Sandstone Group and are derived from a terrestrial semi-arid environment lying about 30 degrees south of the equator. Seasonal floods transported and dumped sediment eroded from rocks in the Caledonian mountain belt.

In the south, the fault-limited Carboniferous Limestone around Castletown is an onshore extension of the Eubonia Basin which formed to the south and south east of the Isle of Man. Together with other fault-bounded basins – the Lagman Basin to the east, the Solway basin to the north-east and the Peel Basin to the west – these structures formed as a result of rifting in the crust as the super-continent of Pangaea started to pull apart in the early Carboniferous. The subsidence which followed produced basins in which sediment accumulated. At the time (about 330 million years ago), the Isle of Man portion of Pangaea was situated close to the equator and under relatively shallow warm seawater. This provided the conditions favourable for deposition of the organically derived sediment which eventually formed limestone.

Castletown Limestone dates from the Early Carboniferous. The oldest rock is Langness Conglomerate which originated on land. Subsequent deposits formed underwater and the resultant limestone thickens towards the fault boundary to the north-west. Offshore, there are Upper Carboniferous strata, which consist more of organic-rich material, the source of the oil and gas currently extracted in the eastern Irish Sea. They are overlain by Permo-Triassic sandstones, mudstones and evaporites, including the Mercia Mudstone Group which is important in trapping hydrocarbons in reservoirs in the rocks. Although exploration for oil and gas has taken place within Manx waters, no potential sources have yet been located.

Rifting in the early Carboniferous was accompanied by volcanic activity, the evidence for which can be seen along the south coast between Scarlett Point and Close Ny Chollagh to the west. The visible features indicate that underwater volcanic activity was succeeded by eruptions above sea level, eventually producing a volcanic island.

Figure 8: Volcanic rocks at Scarlett (Chris Gunns)

Igneous activity is also apparent in the many Tertiary dykes which intrude across Manx shores, a legacy of another much later period of rifting in the crust which started the opening up of the Atlantic Ocean 65 million years ago.

Carboniferous rocks, overlain by Permo-Triassic deposits, have been detected in boreholes under the glacial and Holocene drift of the northern plain. However, the Pleistocene blanket is thick and completely obscures the solid geology. It is important, nevertheless, in interpreting the more recent evolution of the Island; sections through the periglacial sediment, which built up as the ice sheet that once completely covered the Isle of Man retreated northwards, are very informative along more or less the whole of the northern coastline.

27 sites of geological importance have been identified along the coast (Manx Marine Environmental Assessment). https://www.gov.im/categories/the-environment-and-greener-living/marine-planning/manx-marine-environmental-assessment/

Soils and Agriculture

The Isle of Man has relatively varied parent materials, relief and local-scale climates. The world map of soils produced by the United Nations Food and Agriculture Organisation and UNESCO classifies the soils of the Isle of Man as Dystric Cambisols (FAO-UNESCO 1974). Cambisols are soils whose change in properties result from weathering *in situ*. The diagnostic properties include colour, structure (the arrangement of particles into aggregated units), and consistence (the degree and kind of cohesion of soil material). The term Cambisols is derived from the Latin *cambiare*, meaning 'change', indicative of such in situ changes. Dystic means the soils have low fertility and it originates from the Greek *dys* meaning 'ill'. On the Isle of Man, this dystric status is mainly due to soil acidity.

The agricultural economy of the north-west of the British Isles is largely based on grassland, much of which is classed as permanent. The Isle of Man also has a

sizable proportion of cultivation-based agriculture, producing crops and short term leys rather than permanent grass.

Altitude acts as a severe constraint on the extent of arable land, with the vast majority of cultivation taking place below the 200 m contour. Areas above 200 m, referred to as the "Mountain Line" are mostly owned by Isle of Man Government and leased out to grazing tenants. The larger hill area of the northern massif has a fairly deep cover of peat and periglacial head with relatively productive soils. The smaller southern massif is much less productive, having a thin peat layer and many quartz boulders.

Manx soils are associated with the following list of five categories:

A soils associated with slates, flags and shales: stony loams on this are the most widespread soil type;

B soils associated with limestone: all the limestone soils are located in the south of the island;

C soils associated with Peel sandstone and Neb gravels: brown sandy loams on this bedrock are often subject to drought and only occur in the Peel area;

D soils associated with glacial deposits: loams associated with glacial deposits have several soil types associated with them;

E soils associated with peat deposits: soils associated with peat deposits are close to the main lowland peat deposits in the Ballaugh and Greeba Curragh areas.

In aggregate, some 80% of soils/podzols on the Island are derived from slate.

Land quality can be evaluated by the Land Use Capability Classification system, adapted for use in the Isle of Man context. Each of the five soil categories can be divided into a number of sub-categories, 25 in all, based mainly on soil textural characteristics.

Table 8: Distribution of soil categories:

Category	Area (ha)	% of total land area
A	25,225	44
B	1,584	>3
C	524	>1
D	7,191	>12
E	2,588	<5
Urban land		
Open moorland and upland forestry (hill and coastal)	16,878	>29%
	57200 ha	

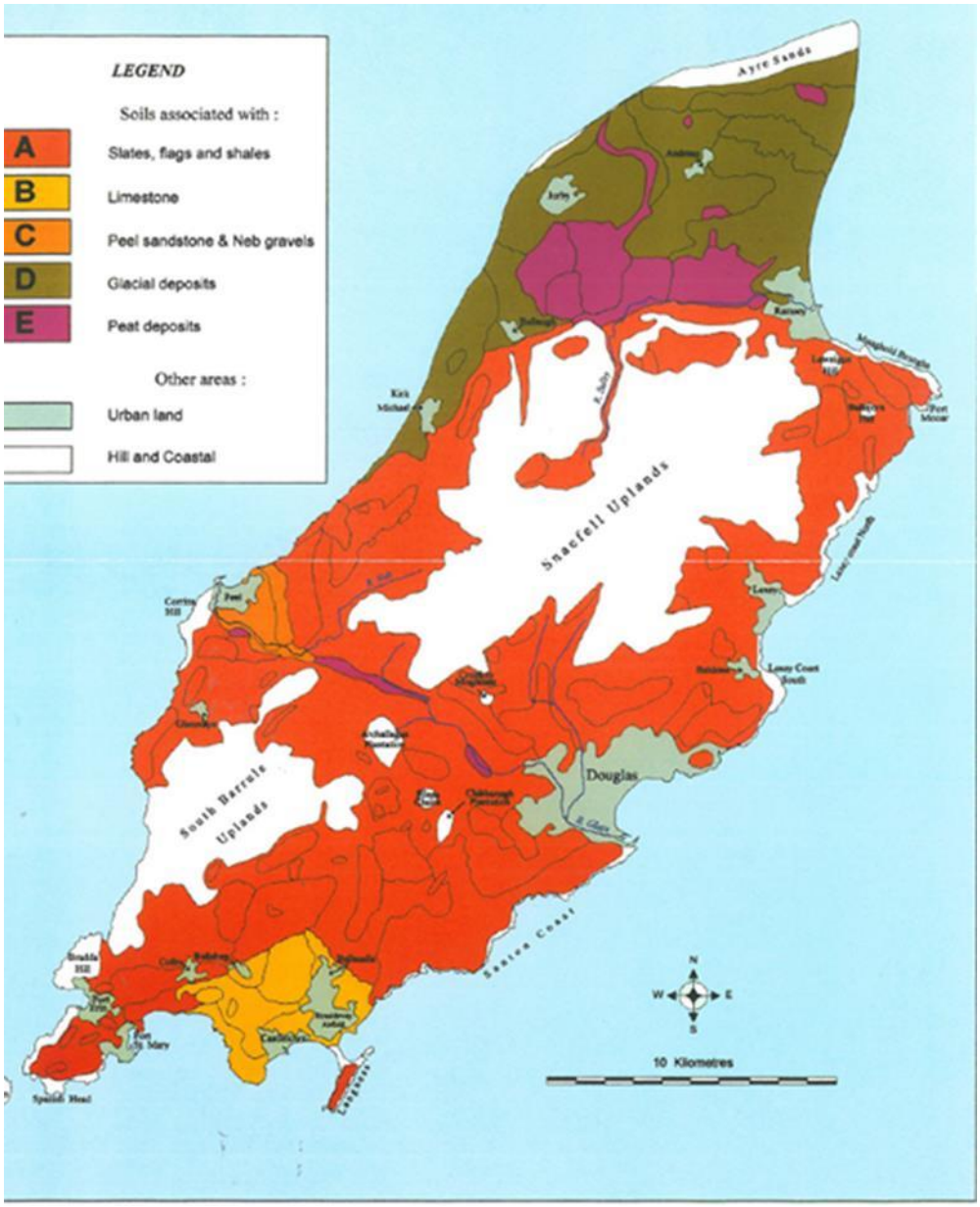


Fig 9: Simplified agricultural soil classification map of the Isle of Man (Agricultural Soils of the Isle of Man, Harris et al 2001, Centre for Manx Studies)

11.5 Bioclimatic zone:

(Indicate the bioclimatic region in which the proposed biosphere reserve is located, refer to the table below and tick the appropriate box for each area of the biosphere reserve).

Table 9: Aridity index resulting from the use of P/ETP

*Mean annual precipitation (**P**)/mean annual potential evapotranspiration (**ETP**)*

Areas	Average annual rainfall (mm)	Aridity index		Core area(s)	Buffer zone(s)	Transition area(s)
		Penman	(UNEP index)			
Hyper-arid	P<100	<0.05	<0.05			

Arid	100-400	0.05-0.28	0.05-0.20			
Semi-arid	400-600	0.28-0.43	0.21-0.50			
Dry Sub-humid	600-800	0.43-0.60	0.51-0.65			
Moist Sub-humid	800-1200	0.60-0.90	>0.65	√	√ marine	√
Per-humid	P>1200	>0.90			√ uplands	

11.6 Biological characteristics:

List main habitat types (e.g. tropical evergreen forest, savanna woodland, alpine tundra, coral reef, kelp beds) and land cover types (e.g. residential areas, agricultural land, pastoral land, cultivated areas, rangeland).

For each type, indicate:
- REGIONAL if the habitat or land cover type is widely distributed within the biogeographical region within which the proposed biosphere reserve is located, to assess the habitat's or land cover type's representativeness;

- LOCAL if the habitat or land cover type is of limited distribution within the proposed biosphere reserve, to assess the habitat's or land cover type's uniqueness.

For each habitat or land cover type, list characteristic species and describe important natural processes (e.g. tides, sedimentation, glacial retreat, natural fire) or human impacts (e.g. grazing, selective cutting, agricultural practices) affecting the system. As appropriate, refer to the vegetation or land cover map provided as supporting documentation.

Figure 10: Land use types (1993)

Land use types	% of land area	Area (sq. km)
Built up area	4	22.92
Amenity grassland	2	11.46
Plantation	6	21.12
Semi-natural vegetation	29	166.17
Agricultural land	59	338.07
TOTAL		**572**

Figure 11: Ecosystem (Habitat) Types as % of Island and Area

Habitat	**% of island**	**Area (ha)**	**Representative-ness**
Woodland and Scrub	**7.5**	**4,031**	
Coniferous plantation	4	2,112	Regional
Broadleaved plantation	1	618	Regional
Mixed plantation	0.2	111	Regional
Scrub	2	1,023	Regional

Semi-natural broadleaved woodland	0.3	167	Local
Upland vegetation	**11.7**	**6,625**	
Dry dwarf shrub heath (moorland)	10	5,646	Regional
Wet dwarf shrub heath (moorland)	0.55	310	Local
Flush	0.8	455	Local
Blanket bog	0.2	106	Local
Modified bog	0.17	93	Local
Valley mire	0.03	14.5	Local
Grassland and marsh	**15.5**	**8,601**	
Unimproved acid grassland	5.6	3,153	Regional
Semi-improved acid grassland	1.8	1,003	Regional
Unimproved neutral grassland	0.02	11	Local
Semi-improved neutral grassland	1.1	634	Local
Marshy grassland	2	1,096	Regional
Poor semi-improved grassland	5	2,704	Regional
Mires (bogs, fens & flushes)	**1**	**669**	
Tall herb and fern	**4.5**	**2,024**	
Continuous bracken	3.5	1,975	Regional
Tall ruderal vegetation	1	49	Local
Swamp & inundation	**0.04**	**24.5**	
Open water			
Standing water (natural and manmade)	**0.3**	**159**	Local
Running water (From Wetland inventory 2006)		**1194 km**	Regional
Coastland	**1**	**576**	
Coastal grassland	0.1	56	Local
Coastal heathland	0.02	11.5	Local
Dune grassland	0.18	101	Local
Dune heathland	0.55	311	Local
Dune scrub	0.003	1.4	Local
Dune Slack	0.01	7.28	Local
Open dune	0.13	75	Local
Bare sand	0.005	3	Local
Lichen/bryophyte heath	0.006	3	Local
Saltmarsh	0.01	7	Local

Marine Habitats

Although Manx waters have been well surveyed, it is impossible to give definitive percentage coverage for marine habitats. Figure 12 shows some of the main marine biotopes and more details on the biotope categorisation can be found in this report:

http://fisheries-conservation.bangor.ac.uk/iom/documents/ShannonWhiteMEPDissertationwithrepresentativeimagesinappendix7.3.pdf

For a detailed description of Manx marine habitats see:

http://www.gov.im/media/983577/3.3_subtidal_ecology.pdf

Marine habitats of particular conservation importance include horse mussel reefs, eelgrass meadows, and maerl beds. In particular, the horse mussel reefs are of regional interest.

12. ECOSYSTEM SERVICES:

12.1 If possible, identify the ecosystem services provided by each ecosystem of the biosphere reserve and the beneficiaries of these services.

(Please refer to the Millennium Ecosystem Assessment Framework and The Economics of Ecosystems and Biodiversity (TEEB) Framework http://millenniumassessment.org/en/Framework.html and http://www.teebweb.org/publications/teeb-study-reports/foundations/)).

Main Ecosystems and land cover types

- Coastal & Marine areas:

  Shallow marine ecosystems
- Rural communities and farmland

  Agro ecosystems
  - Semi-natural lowland grassland
  - Lowland heath
- Upland
  - Heather moorland, acid grasslands
- Woodlands
  - Broadleaved woodland.
  - Coniferous plantations
- Urban ecosystems
- Wetland
  - Willow carr
  - Mires
  - Bogs
  - Wet rush meadows
- Rural communities and farmland

A broad overview of main ecosystem service provision, in order of greatest land area, is shown below:

Coastal & Marine areas (coastal, intertidal, and sub tidal zones) ~4,000km2 marine area plus inter-tidal areas: 87% of IOM territory

Provisioning:

- Food: The Isle of Man has important commercial fisheries for king scallop, queen scallop, crab, lobster, whelk and langoustine (*Nephrops norvegicus*). Most seafood

is exported, but some is sold locally. The Island has strong cultural links to fishing. Recreation fishing, particularly for finfish, is also important.
Regulating:
- Prevention of Coastal Flooding and Erosion: inshore marine habitats such as kelp and eelgrass play a role in stabilising seabed sediments and protecting the coast from erosion.
Cultural:
- Recreational Opportunity: The variety of beaches and coastline supports a wide range of recreational activities including surfing, kayaking and wildlife watching. Marine recreation is a rapidly growing sector in the Isle of Man. Many people are involved in marine recreation, such as diving and angling. They directly experience the biodiversity of Manx waters and value them. Others benefit from opportunities to watch seals, basking sharks and dolphins from the coast.
- Sense of Place & History, Inspiration & Tranquillity: the coast is the area of our earliest settlements to exploit the rich resources of the sea and river estuaries, and the driving force behind the later waves of health and seaside resort development, and continues to offer a source of natural inspiration and peacefulness; both local people and visitors benefit from its qualities.

Rural communities and farmland (small villages and farms) (60% of land surface)

Agricultural land

Provisioning:- Food: major cereals (for human and livestock food), red meat (beef, lamb and pork) production, dairy goods (milk, cheese) from local dairies – most goes to local, and now increasingly national and international markets.
Regulating:
- Climate: some carbon is stored in agricultural soils, however such carbon storage is relatively minor.
- Soil Erosion: agricultural soils are managed by farmers, and it is their own interests in minimise erosion. Codes of Practice and cross-compliance measures manage these issues as much as is practicable.
- Flooding: agricultural land management practices play an important role in the storage of water and/or regulation of surface water runoff from heavy rainfall events to reduce downstream flooding risk of urban areas.
Cultural:
- Recreational Opportunity: the agricultural landscape and its rolling hills provide multiple opportunities and areas/routes for a range of access and outdoor

recreation activities; it makes a major contribution to the health and wellbeing of the local population as well as visitors.
- Sense of Place & History, Inspiration & Tranquillity: the open, rolling landscape constitutes a much valued landscape for locals and visitors;

Uplands (above 200m line) (13,700Ha, 24% land area)

Uplands cover a significant proportion of the Isle of Man and serve many ecosystem services:

Provisioning:
- Food: lamb production, mostly to the Isle of Man or UK. There are also a small number of areas leased for grouse shooting, with inherent requirements to manage the land to encourage the continued presence of grouse and other upland species, for example heather burning according to the Heather Burning Regulations to maintain a mosaic of heather growth stages.
- Water: the important peatland provides all the water supply to the Isle of Man, and its filtering and water storage and flow attenuation are invaluable to provide a year-round water supply to reservoirs with minimal levels of treatment to bring water up to drinking water standard.

Regulating:
- Climate: some 4.5 million tonnes of carbon are sequestered in the peat land cover, which is largely in the uplands. This equates to over 16 million tonnes of carbon dioxide if it were to be lost through oxidation or other losses. This carbon storage, and its on-going management (which is planned as part of the forthcoming Uplands Strategy) is very relevant to the future carbon management of the Isle of Man, certainly in relation to annual emissions of the entire economy of approximately 800,000 tonnes of carbon dioxide (equivalent).
- Water: upland peat and its management play an important role in the storage of water and/or regulation of surface water runoff from heavy rainfall events to reduce downslope and downstream flooding of urban areas in particular. The benefits of this improved water retention and slower release provide year-round water supplies.

Cultural:
- Recreational Opportunity: the uplands provide multiple opportunities and areas/routes for a range of access and outdoor recreation activities; they make a major contribution to the health and wellbeing of the local population as well as

visitors. The extensive areas of plantations and their access will be covered below in the section about woodland.
- Sense of Place & History, Inspiration & Tranquillity: the open, expansive uplands constitute an iconic landscape; it is relatively tranquil for island residents as well as visitors. Several upland sites are notified as Dark Sky sites; the Isle of Man has the highest density of Dark Sky Sites (currently 26) in the British Isles. The uplands have a rich ancient history with many Viking and Celtic sites; local people especially benefit from this strong local identity, and visitors also benefit.

Woodland (including plantations and scrub)

- Nearly all woodland areas are relatively "young", as discussed in sections 9 and 10. The Manx National Glens themselves were largely planted in order to create areas of interest for the booming tourist industry in the mid to late 19th Century; these areas now also show relict ancient woodland ground cover flora, and bryophyte populations. Areas of scrub and bracken are naturally starting to regenerate to woodland with pioneer species such as ash, birch, rowan, holly and elder increasing. The plantations, largely in the uplands, which cover 2800 ha (5% of the land area), were themselves largely planted as "winter-work" schemes when seasonal unemployment outside the tourist season was high in the mid to late 20th century.
Provisioning: fencing materials and firewood. There has been a recent resurgence in demand for logs as bio-fuel for households, although it is important that the sustainability of plantation and woodland management is considered, wherever the fuel comes from.

Regulating:

- Climate: carbon sequestration occurs in standing timber and woodland soils of local forests, making a relatively small contribution to absorption of local emissions; trees and woodland play a significant role in purification of local air quality.

Cultural:

- Recreational Opportunity: woodlands (including plantations) offer scope for natural recreation and contact with nature and the outdoors for local people, for

whom they are very popular. Work is ongoing to provide more accessible trails and paths into the woodlands and plantations to increase their accessibility and use to people.

Urban Centres/Built-up areas (including urban greenspace) (8.6% land area)

Provisioning:

- Food: small-scale individual vegetable and fruit production in gardens and allotments. There has recently been an increase in the number of allotment sites and allotment holders.

- Recreational Opportunity: Urban areas offer numerous possibilities for informal and organised recreation activities, including in the extensive network of parks, gardens and other green spaces; local residents, in particular, benefit from this essential resource for promotion of natural health and wellbeing.
- Sense of Place & History, and Inspiration: the rapid growth of our coastal urban areas, especially over the past 150 years, and the booming mining and then tourism industries of the time have bestowed a rich legacy of distinct landscape features. These include the Manx National Glens, many of the culturally significant buildings (such as Gaiety Theatre, Villa Marina), mining legacy buildings, narrow gauge railways, culture and architecture, together with urban parks and green spaces, TT motorcycle races. All of these contribute to a very strong sense of place and urban history for local residents and visitors alike.

Wetland

Regulating:

- Regulating Climate: carbon is sequestered in anaerobic waterlogged peat soils of local wetlands, which have been recorded to be up to 6 metres deep in some places and temporarily in vegetation growth, making a not insignificant contribution to absorption of local emissions, and carbon storage.

Cultural:

- Recreational Opportunity: Access to the Ballaugh Curragh and education for the school population and the broader population on the Isle of Man's role in regional

and global biodiversity conservation is an important role of the Curragh Wildlife Park and its >50,000 annual visitors.

12.2 Specify whether indicators of ecosystem services are used to evaluate the three functions (conservation, development and logistic) of biosphere reserves. If yes, which ones and give details.

No not at present.

Two assessments of ecosystem services have been carried out since 2012 (see section 12.4). An ecosystem services framework will be considered as a potential structure to organise our future Biotic, Abiotic and Socio-Economic Research Plan to assess changes to variables (and their indicators) under the three Biosphere objectives.

Biodiversity indicators are being developed for the Biodiversity Strategy; these include bird population trends. An indicator such as farmland birds would help understand the ecosystem services farmland birds provide, such as pest control.

Other potential indicators of specific ecosystem services could be drawn from:

- Provisioning services: populations of wild caught marine life, cost of treating water supplies
- Regulating services: of Climate, Soil Erosion, Water Flooding, Coastal Flooding and Erosion
- Cultural services: Recreational Opportunity, Sense of Place/Inspiration, Tranquillity, Sense of History; plus Biodiversity and Geodiversity

12.3 Describe biodiversity involved in the provision of ecosystem services in the biosphere reserve (e.g. species or groups of species involved).

- Fish and shellfish (marine and freshwater) – a range of species are targeted by local inshore commercial marine fisheries, including scallops, crabs, lobsters, Langoustine and some white fish (e.g. Pollock - *Pollachius pollachius*). Recreational fisheries include, for example, mackerel in the sea and sea trout in the river estuaries, and pots for lobster and crab, by licence.
- Bees and wild pollinating insects – these play an important role in agricultural crop pollination, as well as in urban areas also for allotments and other food-growing schemes and for flowering plants in urban green spaces including public parks and private gardens.
- Trees (in woodlands and urban environments) – a range of native broadleaved species occur both as wild plants and planted individuals, including a healthy number of elm trees, relatively unaffected by Dutch Elm Disease (>250,000 trees), all of which help to ameliorate local air quality, provide shade, absorb some human carbon emissions, and some of this hardwood and softwood is also harvested for timber and firewood.

- Predator species (varied groups) – various predators and parasites of insect pests (e.g. - parasitic wasps and aphids) are important to prevent major outbreaks which can have damaging effects on food and horticultural crops.
- Wild game, seashore animals and fruit – public foraging of a wide range of local wild food takes place on a relatively small scale, for example to control rabbit populations

(excess numbers can severely damage crops), collect shellfish in pots such as crabs and lobsters (when holding a licence to do so), or harvest blackberries and other hedgerow fruits such as elderflower/elderberry in season (*Sambucus nigra*).

The vegetation of Heath, moorland and wetland ecosystems make significant contributions to carbon sequestration – greater than the GHG emissions from human life on the Island. Managing that carbon balance is a key objective for the biosphere reserve in contributing to sustainable development.

12.4 Specify whether any ecosystem services assessment has been done for the proposed biosphere reserve. If yes, is this assessment used to develop the management plan?

Terrestrial
Brander and McEvoy (2012) **The economic value of ecosystem services from the terrestrial ecosystems of the Isle of Man (unpublished internal report)**.

Ecosystem services for each broad Manx ecosystem were assessed using value transfer methods (Brander and McEvoy). The valuation drew on the results of existing initiatives including the UK National Ecosystem Assessment (NEA) and The Economics of Ecosystems and Biodiversity (TEEB).

Six economically important ecosystem services were valued, namely outdoor recreation, aesthetic enjoyment of the landscape, nature-related tourism, flood control, water supply, and water quality regulation. Due to data limitations, not all ecosystem services from all ecosystem types could be valued in this assessment.

The study valued this small selection of services from terrestrial ecosystems as £42 million a year. This excludes carbon sequestration and many other services.

Marine
Mead A, Beaumont N and Austin M (2014) **An approach to valuing the marine ecosystem services of the Isle of Man.** Plymouth Marine laboratory unpublished report for the Isle of Man Government

This study aimed to identify the benefits of the Isle of Man's marine environment to society.

By valuing the benefits, the value of the ecosystem services that such benefits are derived from (for example, biodiversity, inclusive of charismatic species) as well as the underlying ecosystem processes that enable them (for example, biogenic ecosystem provision) becomes explicit. A range of ecosystem benefits were identified and a set of indicators (utilizing a range of different metrics) were developed to assess the value of each benefit to society.

- Isle of Man scallop production was valued at £3,563,228.85 per annum based on first sale landings data for 2011.

- Carbon sequestration within the intertidal kelp forests across the whole of the Isle of Man was valued at £84,756 - £257,295 depending on carbon price and using non-traded carbon values as calculated by DECC (2011).
- Carbon sequestration within the seagrass beds across the whole of the Isle of Man was valued at £11,284.28 per annum in 2012 using non-traded carbon values as calculated by DECC (2011).
- The cost of replacing natural processing by the marine environment with tertiary level sewage treatment plants was calculated as £1,020,208.13 per annum for the Isle of Man, based on 2006 benefit transfer data.
- With 75-95% of tourists indicating they visited the Isle of Man primarily due to the marine environment, a value of £68,232,620 to £86,427,980 per annum was calculated for tourism within the Isle of Man based on 2010 data, based on *per diem* spend.
- In addition, only certain aspects of marine-based leisure and recreation could be valued: basking shark tourism in Peel in 2009 (£87,273 per annum) and the media coverage for charismatic species, using estimated advertising equivalent for 2008/2009 (£425,429 per annum).

No management plan has yet been prepared, but this is planned and will use the results of these and subsequent ecosystem service assessments.

13. MAIN OBJECTIVES FOR THE BIOSPHERE RESERVE'S DESIGNATION:

13.1 Describe the main objectives of the proposed biosphere reserve, integrating the three functions (conservation, development and logistic), presented below (sections 14 to 16), including components of biological and cultural diversity. Please specify the indirect pressures and/or organizational issues.

AIM

UNESCO Biosphere Isle of Man would recognise the Isle of Man as a special place for people and for nature. It will provide the Isle of Man with a unique opportunity to show how its high quality environment, economy and community pride complement each other. The Island would be the first entire small country to be nominated as a UNESCO biosphere reserve.

The overall aim is to see the Isle of Man become an even better place for people and nature and the more our community gets involved, the more we can help the island to stay special.

The key message to stakeholders and in communication materials is to encourage greater sustainability, and it is for the Isle of Man to communicate how it has a vibrant community, healthy environment and thriving economy.

Objectives

1. To visibly demonstrate sustainable economic development through showing how a thriving, diverse modern economy and healthy ecosystems can co-exist and complement each other.
2. To actively engage people in the use, appreciation, conservation and management of their local area.
3. To communicate how our community cares about its rich cultural heritage and sustains it into the future.
4. To raise awareness of the qualities and features of the island which we value and communicate their importance.
5. To demonstrate the balance between environment, society and economy, so that the Isle of Man qualifies for this international accolade.

Another important initiative for the Isle of Man, is support of this nomination, is the EcoVannin joint venture between Government and NGOs whose objectives mirror those of Biosphere Isle of Man, and who are involved in the Steering Group of Biosphere Isle of Man and as delivery partner, much as EcoDyfi is for Dyfi Biosphere in Wales.

The initiative has been established as a reflection of the shared ambitions of Government and three NGOs (Manx Friends of the Earth, Zero Waste Mann and Manx Energy Advice Centre). These NGOs campaign on issues relating to the Island's environment, the sustainability of activities and the benefits to community

and business from doing things in cleaner, greener ways. Each also gives advice and information to help people make better decisions for themselves. In addition, Government itself has a keen interest in ensuring that the Manx economy is resilient, sustainable and run in an environmentally responsible manner to support its overarching agenda for more sustainable economic development and employment opportunities.

Environmental Pressures

- Climate change
- Increasing population
- Agricultural improvement
- Strain on institutional capacity such as people with suitable skills.

Social Pressures

- Health and Wealth Inequality
- Aging population

Economic Pressures

- Knock on effects from Global Financial Crisis
- Urgent need to balance government budget (major cuts in government budget)
- Difficulty in mobilising private resources (traditionally government has led on many areas of life)
- Lack of external funding for projects (EU, UK heritage lottery, landfill tax and international environment funds not available to Isle of Man)

Organisational issues
DEFA and MNH both have responsibilities for natural heritage, although DEFA is formally responsible for the Wildlife Act, which is the main conservation legislation. MNH, DEFA and the Manx Wildlife Trust work in partnership on many issues such as biological recording.

Engaging more effectively with community organisations and private businesses will be increasingly necessary to take forward this initiative.

A range of communication materials are attached in Appendix 5.

13.2 Describe the sustainable development objectives of the biosphere reserve.
(If appropriate, please refer to Agenda 21, Rio+20 and SDG post 2015).

There is already a good track record of pursuing more sustainable development, with significant plans to improve further in the future.

Logistic function – social (and cultural) pillar of sustainability

Education for sustainable development and applied research alone do not fulfil the social (and cultural) pillar of sustainability adequately. The economic pillar of sustainability does not take the social and cultural dimension of sustainable development into account. The challenges of the coming years are very large, with an ageing population and a rapidly increasing dependency ratio.

The objectives for sustainable development in a social and cultural sense take many directions:

- the organisation of the best possible participation and integration in community life for an older generation that is increasing in number,
- the development and maintenance of an intensive attachment of the young generation to the Isle of Man, which is not severed even when moving away for further or higher education or training,
- the promotion of voluntary commitment to strengthen the population's sense of community,
- the active preservation and further development of typical Manx culture, customs, Gaelic music, folk dances, amateur dramatics, festivals – by practising them and passing them on to younger generations instead of conserving them in museums,
- enabling common experiences between generations in cultural activities and more,
- education and research to promote and accompany the region on its efforts to become more sustainable.

Education for sustainable development (ESD) should begin by facilitating experiences of nature and conveying knowledge about our environment. It must raise and sharpen the awareness of the problems and potential in the Isle of Man as a habitat in the context of sustainable development. It should present alternative actions and side effects and implement these in an exemplary and practical manner. It should contribute to creating or regaining a "sense of place", which cannot be communicated by the media. The success of ESD could be measured in the long term by the extent to which it has managed to instil a responsible and more sustainable attitude among the population as a whole. The task of applied research in the biosphere reserve is to address scientifically the questions that arise on the path towards sustainable development and to create a decision-making basis.

Sustainable development objectives

- Marine and terrestrial natural resources are safeguarded, healthy and resilient.
- There are more and better jobs for now and for the future.
- The people of the Isle of Man are healthy.
- People live in safe, viable and vibrant communities.
- There are increased opportunities for people to achieve a better quality of life, and all people are wealthier and there is greater equality.
- People have the knowledge and ability to make the best choices for future wellbeing of themselves and the island.

The Island, being small and having its own government, has the potential to easily promote and effectively implement economically, socially, and environmentally sustainable development to the benefit of all.

Climate change
At the request of the Isle of Man Government, the UK extended coverage of its commitment to the Kyoto Protocol to the Isle of Man. As a result, since 1990, greenhouse gas emissions from the Island have been monitored and reported to the UK as part of its inventory. In May 2013, Government adopted "…a greenhouse gas emissions target for the Isle of Man of 80% reduction of 1990 levels by 2050". Achieving this target will require economy-wide emissions reductions which will affect the whole of society. While Government recognises that it cannot seek to influence the development of some of the technologies required to meet this target, such as low emissions vehicles, it can influence emissions in other areas, such as the building stock and electricity generation, through the introduction of appropriate policies and strategies. The CO_2 emissions conversion factor from power generation is already markedly reduced from its 1990 levels (see Section 15.4.1).

The Isle of Man has also been able to trial and adopt a scheme for refurbishment and modernisation of housing. In October 1999, European Council Directive 1999/85/EC amended Directive 77/388/EEC to allow a reduced level of VAT to be applied to labour-intensive services on an experimental basis. Belgium, France, Italy, the Netherlands, Portugal, Spain, and the UK (Isle of Man only) chose to participate in the experiment and took all or part of the renovation and repair of private dwellings as part of the services covered. In the case of the Isle of Man, a survey of contractors showed that around 95% of traders believed that their business increased after the VAT reduction. This measure was designed to stimulate employment and address the shadow economy while not creating any trade distortions and to reduce CO_2 emissions. Initially introduced on an experimental basis, it has now been extended permanently on the Isle of Man. This project may be of interest to other regions and countries.

Clean technology
The Isle of Man is proactive in pursuing green technologies and is establishing a reputation as a jurisdiction to which 'Clean Tech' businesses are choosing to relocate. The Isle of Man's 50 year history of precision manufacturing within the aerospace sector means we can deliver the engineering skills and advice requirements of many clean tech businesses.

The Isle of Man introduced the world's first zero carbon, clean emission motorbike grand prix in 2009.

The Isle of Man has excellent natural resources, including one of the best areas for wind energy in the British Isles, a Spring tide that travels at 3 metres per second and a 5 metre tidal range. This offers good research and development opportunities for tidal energy generation.

The clean tech sector has shown remarkable resilience and growth, with potential for inter-linkages to other parts of the economy, for example, the Isle of Man Ship

Registry. This has been doing well since it was established more than 25 years ago. In April 2014, it announced that it was introducing new incentives for ship owners to adopt energy-efficient ship designs which reduce fuel consumption and air pollution. For new vessels registering that qualify, there will be a 25% reduction in Certificate of Registry fees and a 10% annual discount for vessels already registered which make changes. Since the International Maritime Organisation (IMO) formalised an international system for determining the energy efficiency of ships, it is now possible to compare energy efficiency across ships of different types and sizes. This system forms the basis of the Isle of Man's 'green ship' incentive scheme.

The Director of the Isle of Man Ship Registry commented: '*Shipping is a global industry and requires an international solution to the problem of air pollution caused by ships. It is fair to say that the shipping industry is the first to tackle emissions on a global scale. 'This 'green shipping' initiative is an important part in our drive to reduce emissions from ships and is welcomed by our clients*.

Manx Marine Environmental Assessment, which assessed current biotic and abiotic issues in the Manx territorial waters covering 4000 square kilometres or 87% of Manx territory, has now been completed.
https://www.gov.im/categories/the-environment-and-greener-living/marine-planning/manx-marine-environmental-assessment/

Vision2020, the island's vision for the future economy, makes repeated mention of improving economic, environmental and social sustainability http://www.whereyoucan.com/vision2020. This is already happening in the fisheries sector (see section 15.3)

An interesting topic will be to help develop agri-business whilst allowing it to provide robust food security into the future for our distinctive local food and drink, as well as 'destination island' focusing on why the Island is such a remarkable place to live, work and visit. http://www.huffingtonpost.co.uk/zahra-razavi/going-local-food-on-the-i_b_6304428.html

Agenda for Change (Isle of Man Government document) sets out the foundations for a sustainable future for the Isle of Man.
It commits the government to addressing the three key priorities of:

- Protecting the vulnerable
- Growing the economy
- Re-balancing the budget

Further detail on these issues are covered in Sections 15.1 and 15.4.

13.3 Indicate the main stakeholders involved in the management of the biosphere reserve.

a) A summary overview of the principal stakeholders engaged in the management of the biosphere reserve, according to zone, is as follows:
Terrestrial core areas – Department of Environment, Food and Agriculture (and individual ASSI owner/occupiers).

Terrestrial buffer zones – Department of Infrastructure for land use planning and Manx National Farmers Union covering a significant proportion of farming landowners, alongside other significant parties such as Manx National Heritage, Manx Wildlife Trust and other interested parties through ownership, or influence.

Terrestrial transition areas – Department of Infrastructure – land use planning and planning policy, as well as other public sector partners such as Department of Education and Children, Department of Economic Development – all of whom seek to assist moving towards a vibrant community, healthy environment and thriving economy that remains a special place for nature and a special place for people.

Marine zones – designations are progressed in partnership with Department of Environment Food and Agriculture, Department of Infrastructure (in whom ownership is vested and Marine Spatial Planning is under development) and Manx Fish Producers Organisation, with scientific advice from University of Bangor. Marine issues also need to bear in mind Fisheries Management Agreements with neighbouring jurisdictions.

b) A more complete list of the main stakeholders concerned with the management and making suggestions to the planned management plans is set out below.
Public Sector Partners:
- Department of Environment Food and Agriculture
- Department of Infrastructure
- Department of Economic Development
- Department of Education and Children
- Manx National Heritage

Environmental/Cultural Organisations:
- Manx Wildlife Trust
- EcoVannin
- Culture Vannin
- Beach Buddies
- Farming and Wildlife Advisory Group (FWAG)
- Manx Birdlife
- Manx Society for Marine Conservation

Community Groups:
- The Children's Centre
- Southern Community Initiative (inc The Hub Club, Men in Sheds, Animates etc)
- Municipal Association including Braddan Commissioners and Douglas Borough Council
- Isle of Man United Nations Association
- Several Rotary Groups

- Isle of Man Scout Federation
- Duke of Edinburgh Awards (through Isle of Man College)

Educational Organisations:
- One World Centre
- Centre for Manx Studies
- Curragh Wildlife Park
- Eco-Mann website (resource for IOM Schools working on Eco-School topics)

Businesses:
- Manx National Farmers Union
- Manx Fish Producers Organisation
- Isle of Man Creamery
- Isle of Man Bank
- Isle of Man Post Office
- Manx Telecom
- Isle of Man Institute of Directors
- Microgaming
- PokerStars
- PDMS
- ISO QA IOM
- Luminaires
- Capital International Group Ltd
- Dot Performance

13.4 What consultation procedure was used for designing the biosphere reserve?

The consultation, stakeholder engagement and nomination process commenced in summer 2012, when a postgraduate student from Edinburgh University, Ms. Moon Jeong Kang, undertook a project on the Island entitled "Could the UNESCO Biosphere Reserve designation improve the status of Ecosystem Services on the Island?" (see Reference list in Section 19(6). This involved interviewing a wide range of stakeholders (viewed as representative), as well as members of the public on the topic of biosphere reserves and its potential to positively affect ecosystem services for the Isle of Man. This was seen as an ideal opportunity to assess levels of interest in the concept and its suitability for an entire jurisdiction. The key findings from this report was that awareness of biosphere reserves was low, with very few having heard of them, although once the concept was explained, 93% were in support of the Isle of Man seeking nomination as a biosphere reserve.

The two objectives of this study were to scope the feasibility of the Isle of Man as a potential UNESCO Biosphere Reserve (BR) site and to explore if the BR designation would positively affect to the status of ecosystem services on the country. The study used the expert interview and public survey for figuring out the people's attitude toward the BR and for estimating possible benefits and changes the site nomination could bring about on the Island. Key stakeholders were selected based on the two classification criteria; if the stakeholders' ultimate concern is associated with economic development or environmental conservation, and if the stakeholders are related with government or private and non-government sector. This categorization aimed for reflecting stakeholders' opinion whose interest and purpose might conflict with each other.
It was found that both the expert stakeholders and general public were generally unaware of the BR concept. However, after they provided by the explanation of BR, they showed positive attitude toward the BR proposal. The BR designation was expected to bring about social, environmental, and economical benefits, as well as international recognition of the Isle of Man. For addressing the question about possible influence of BR designation to the Island, three hypotheses were designed and discussed. First of all, it is expected that BR would raise local people's understanding and awareness of local environment by heightening the level and opportunities of educations, as well as encouraging people to pay attention to their environmental surroundings. Secondly, the study could draw a positive expectation about the BR's potential to promote community engagement and various stakeholder involvements regarding to local environmental issue. BR is expected to provide both motivation and more opportunities for people to participate these activities. Finally, it is shown that the BR might contribute to an improvement of the status of ecosystem services by brining integrative framework and its unique zoning scheme.

Figure 12: MSc Dissertation in 2012 posing the question could the UNESCO Biosphere Reserve designation improve the status of Ecosystem Services on the Island.

The results from this study gave confidence to promote the concept at a Government Department, DEFA level and to assess whether it would be relevant to include it in the Department's Service Delivery Plan. This resulted in the aspiration to seek biosphere reserve status for the Isle of Man as a whole, as a Government topic. This was further validated when it was reviewed and included in the work programme of the Environment and Infrastructure Committees (a political committee tasked with monitoring, reporting and progressing topics relevant to Environmental and Infrastructure related topics), which was debated and supported in the Isle of Man Government and Parliament (Tynwald) in May 2013. Following this stage, it became appropriate to seek support outside Government Departments and to engage with NGOs, businesses and civil society to broaden engagement and support.

This stage allowed the project to be actively discussed widely at Officer level across Government, with NGOs, businesses and business forums. In summary, the project has been discussed with a great many NGOs and businesses, several of whom are represented on the Steering Group. All parties are shown a Project Overview document and a general discussion about the project, its background and how it might be relevant for the Isle of Man. All groups engaged with are asked to comment on and, if appropriate, support the principles described in the Project Overview and its Aims, Objectives, Deliverables and Scope. More formal presentations have been to larger groups, such as the annual lecture of the Isle of Man United Nations Association to an audience of over 150 in October 2013, where positive feedback was received. Letters of support are attached to show

business and other partners' interest and willingness to be involved in taking the project forward.

Following on from this, an open photographic competition in October and November 2013 was an opportunity to bring the project to a very wide audience and to introduce the concept of ecosystem services. The photo competition was far more popular than anticipated, with over 250 entries. The judges were so impressed with the standard of entries they requested shortlisted entries to be displayed, which enjoyed an audience of nearly 1,000 visitors and a large number of contact details of people supportive of the project and wanting to be kept informed of progress.

A recurring question was how a business or groups could get involved. In response to this a Biosphere Pledge was developed, adapted from biosphere reserves in the UK and Canada, and which has been popular with stakeholders. The first business to sign up as a formal Pledge Partner was Royal Bank of Scotland International (which includes Isle of Man Bank) with over 300 staff, as it is seen to be complementary to their very active Corporate Social Responsibility programme. Eight schools also signed up, with over 3000 pupils, which is separate from the Department of Education and Children as an entire Department being a major partner in the project with over 12,000 pupils between ages of 5 and 18. A recent iteration of this engagement has been to prepare communication materials along with a website and social media (see Appendix 5). To date, there have been over 30 news releases and articles on the project and, unusually for a government-initiated and -supported project, there has been wide-scale support and no overt hostility.

A very significant stage in the process, following Madrid Action Plan Target 10: Participatory processes, was a Stakeholder meeting to progress the zonation, with a deliberately broad range of invited stakeholders. The process used was adapted to our situation by using a technique called Facilitated Workshops. This innovative process creates a very interactive open discussion session which engenders a far more productive exercise than a traditional consultation event. In this case, it came up with many very positive and constructive suggestions on zonation, and also showed how stakeholders wished to be kept informed about the project and how they could be more formally engaged (see *Appendix 3)* for event agenda, stakeholder list, and report.)

13.5 How will stakeholder involvement in implementing and managing the biosphere reserve be fostered?

The Biosphere Steering Group works under an agreed Terms of Reference (see *Appendix 2*) (as summarised in Part 1 sections 4.6.1 and 4.7.c), with individual partners registering their support through letters of support.

Following the submission of this nomination form to UNESCO, the Steering Group will produce a management and action plan, linking it to any Biodiversity Strategy the government may wish to introduce. It is expected that individual partners or sectors will then develop specific action plans as appropriate to direct their particular implementation elements.

Beyond the signed-up partners, there is register of many other local organisations to whom information on the project can be communicated and input invited. This process can be continued to encourage involvement in specific elements of the action plan as it progresses. For example, regarding environmental education in schools, it is remarkable that the Isle of Man is independent as to the educational curriculums it follows. This allows more flexibility to ensure local pupils have a tailored educational experience; UK peers frequently visit and comment on this. The Department of Education have been particularly active in developing a "Manx" curriculum, alongside other active partners such as Manx National Heritage and Manx Wildlife Trust.

It is also important to continue to engage individual members of the local community to be involved in making the biosphere reserve and its aspirations increasingly tangible by helping to form and implement the prospective management strategy. This will take place through general dissemination and publicity methods, and especially through the "Biosphere Buddies" e-group, as well as social media followers on Twitter and Facebook which are continuing to expand. Those involved in developing the biosphere reserve will also continue to attend and present at relevant local events and meetings, as has been done to date, to promote the initiative and peoples' engagement in it.

13.6 What are the expected main sources of resources (financial, material and human) to implement the objectives of the biosphere reserve and projects within it?

(Please provide formal commitments and engagements.)

Our prospective management strategy and future action plan will be implemented in various ways:

- Existing planned and funded projects by partners which can be (more) closely aligned with our shared vision and objectives,

- Changed operational policy and practice within individual partner organisations to better deliver Biosphere objectives (not necessarily having cost implications),

- New proposed projects, for which it is likely that external funding from public or private grant-making or sponsoring bodies (at local, national or international levels) would need to be secured.

This could happen through a number of individual project funding bids and/or though one or more funding applications.

As the Island Government and major stakeholders are formally involved in the nomination process, from the Chief Minister (equivalent to Prime Minister in the United Kingdom) downwards, there is full support for implementation of the management plan for the Biosphere Reserve, and its appropriate funding. Civil society and the Business community, as well as rural industries and fishers are all supportive of the bid, and committed to provide human resources and where necessary financial support to ensure the successful outcome of the nomination, and subsequent management of the BR.

Examples of letters of support can be found in Appendices 5 a,b,c

14. CONSERVATION FUNCTION:

14.1. At the level of landscapes and ecosystems (including soils, water and climate):

14.1.1 Describe and give the location of ecosystems and/or land cover types of the biosphere reserve.

Ecosystem and land use types

- Coastal & Marine areas:

  Shallow marine ecosystems
- Agro ecosystems
  - Semi-natural lowland grassland
  - Lowland heath
- Upland
  - Heather moorland, acid grasslands
- Woodlands
  - Broadleaved woodland.
  - Coniferous plantations
- Urban ecosystems
- Wetland
  - Willow carr
  - Mires
  - Bogs
  - Wet rush meadows
- Rural communities and farmland

Designation Documents for terrestrial and marine protected area, along with Statutory Powers can be found in Appendix 1

Fig 13, Landscape Character Assessment, 2008 (commissioned for the Strategic Plan (Isle of Man Government 2008).

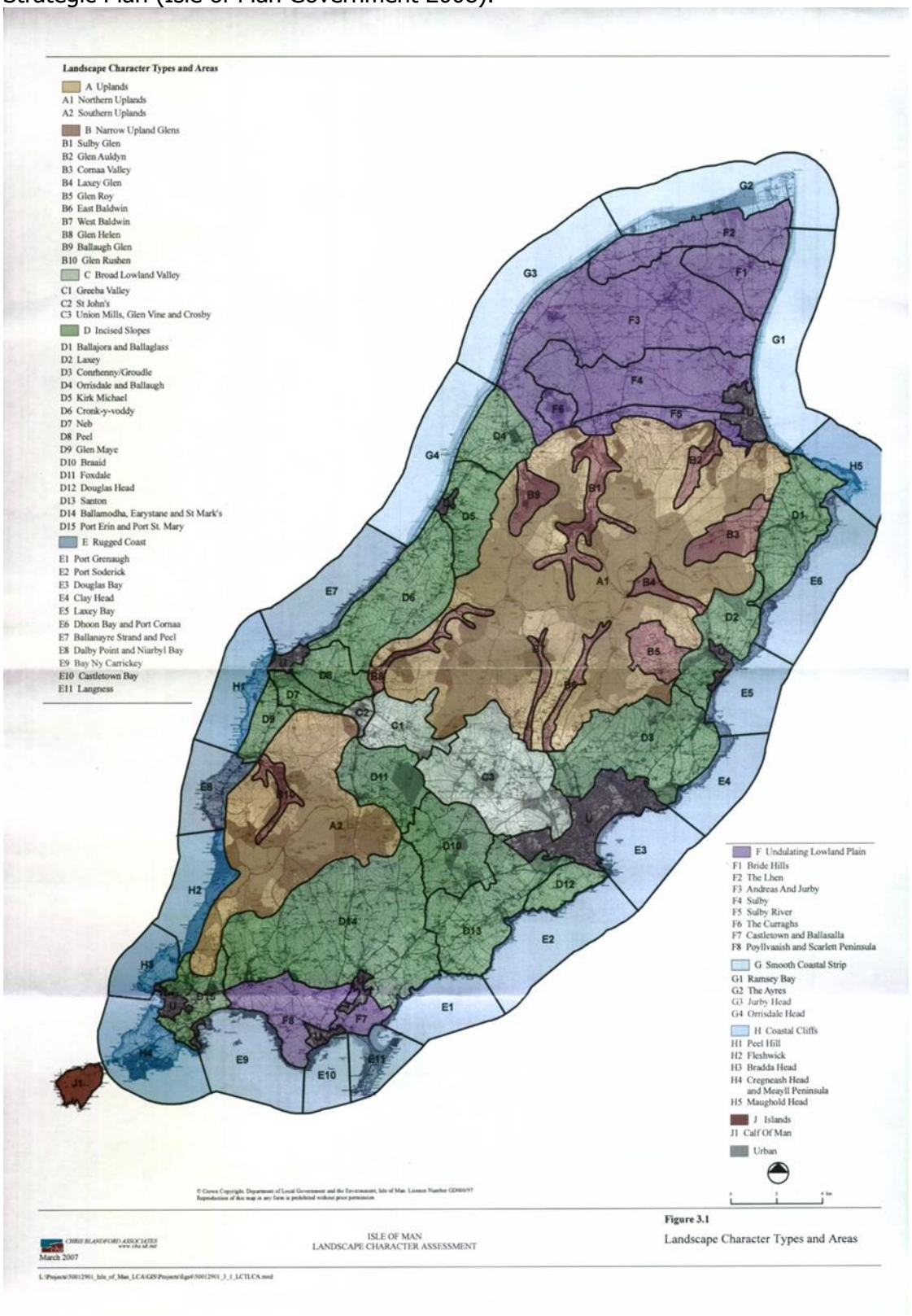
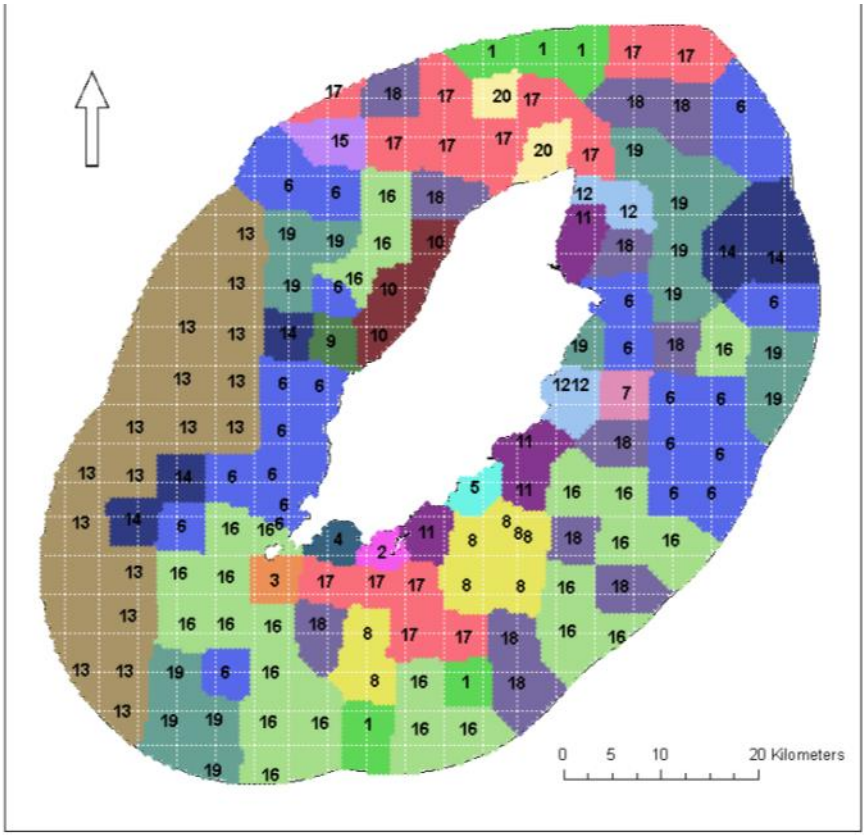


Figure 14: Marine biotopes.



Biotope label	Biotope Code	Biotope Description
1	CR.HCR.XFa.SpNemAdia	Sparse sponges, *Nemertesia* spp. and *Alcyonidium diaphanum* on circalittoral mixed substrata
2	CR.MCR.EcCr.CarSp.PenPcom	*Caryophyllia smithii* and sponges with *Pentapora foliacea*, *Porella compressa* and crustose communities on wave-exposed circalittoral rock
3	CR.MCR.EcCr.FaAlCr.Pom	Faunal and algal crusts with *Pomatoceros triqueter* and sparse *Alcyonium digitatum* on exposed to moderately wave-exposed circalittoral rock
4	IR	Infralittoral rock (and other hard substrata)
5	SS.SBR.SMus.ModCvar/ SS.SMp.Mrl.Pcal.Nmix	*Modiolus modiolus* beds with *Chlamys varia*, sponges, hydroids and bryozoans on slightly tide-swept very sheltered circalittoral mixed substrata/*Phymatolithon calcareum* maerl beds with *Neopentadactyla mixta* and other echinoderms in deeper infralittoral clean gravel or coarse sand
6	SS.SCS.CCS/SS.SMx.CMx	Circalittoral coarse sediment/Circalittoral mixed sediment
7	SS.SCS.CCS.Nmix	*Neopentadactyla mixta* in circalittoral shell gravel or coarse sand
8	SS.SCS.CCS.Nmix/ SS.SCS.CCS.MedLumVen	*Neopentadactyla mixta* in circalittoral shell gravel or coarse sand/*Mediomastus fragilis*, *Lumbrineris* spp. and venerid bivalves in circalittoral coarse sand or gravel
9	SS.SMp.KSwSS.LsacR.CbPb	Red seaweeds and kelps on tide-swept mobile infralittoral cobbles and pebbles
10	SS.SMp.KSwSS.LsacR.Gv	*Laminaria saccharina* and robust red algae on infralittoral gravel and pebbles
11	SS.SMp.Mrl.Pcal	*Phymatolithon calcareum* maerl beds in infralittoral clean gravel or coarse sand
12	SS.SMp.Mrl.Pcal.Nmix	*Phymatolithon calcareum* maerl beds with *Neopentadactyla mixta* and other echinoderms in deeper infralittoral clean gravel or coarse sand
13	SS.SMu.CFiMu.BlyrAchi	*Brissopsis lyrifera* and *Amphiura chiajei* in circalittoral mud
14	SS.SMu.CSaMu.VirOphPmax	*Virgularia mirabilis* and *Ophiura* spp. with *Pecten maximus* on circalittoral sandy or shelly mud
15	SS.SMx.CMx.ClloMx	*Cerianthus lloydii* and other burrowing anemones in circalittoral muddy mixed sediment
16	SS.SMx.CMx.ClloMx.Nem	*Cerianthus lloydii* with *Nemertesia* spp. and other hydroids in circalittoral muddy mixed sediment
17	SS.SMx.CMx.FluHyd	*Flustra foliacea* and *Hydrallmania falcata* on tide-swept circalittoral mixed sediment
18	SS.SMx.CMx.OphMx	*Ophiothrix fragilis* and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment
19	SS.SSa	Sublittoral sands and muddy sands
20	SS.SSa.IFiSa.ScupHyd	*Sertularia cupressina* and *Hydrallmania falcata* on tide-swept sublittoral sand with cobbles or pebbles.

Table 11: Distribution of biotopes at the lowest level of ecosystem classification based on significant community groupings.
Classifications are based on the Marine Habitat Classification for Britain and Ireland Version 04.05 (Connor et al 2004). (Reproduced from White 2011 with permission).

Shallow marine ecosystem
The Isle of Man has a long history of marine research on benthic ecosystems. Much of the research of the Port Erin Marine Laboratory operated by Liverpool University (closed in 2006) focussed on the sea to the south of the Isle of Man. The Calf of Man is recognised for its high biological diversity and presence of rare species in the diverse rocky reef ecosystems which surround this smaller island. In recent years, significant progress has been made in understanding of the marine ecosystems throughout the Manx Territorial Sea. Recent studies have highlighted extensive areas of regionally important ecosystems:

- There is an extensive horse mussel reef (*Modiolus modiolus*) to the north east of the Point of Ayre, a small but diverse horse mussel reef south of Douglas, and another small area off the Jurby coast. A large horse mussel reef south of Langness is thought to have been largely lost, but patches of reef ecosystem have recently been recorded in the area.
- Eelgrass (*Zostera marina*) beds are found in Langness Gully, Garwick Bay (in Laxey Restricted Area, Core Area), in Baie ny Carrickey Fisheries Closed Area (Core Area) and in the south of Ramsey Marine Nature Reserve (Core Area).
- Extensive maerl beds (coralline red seaweed) have been found in Ramsey Bay and at a number of other sites around the Isle of Man.
- Ross worm (*Sabellaria spinulosa*) has been found in the extreme southern area of the Manx Territorial Sea.

The marine ecosystems of Manx waters were systematically surveyed by Bangor University starting in 2008, and the initial results of this survey can be found in Hinz et al (2010), "Further analysis of the survey data resulted in categorising marine ecosystems using the widely accepted EUNIS system of classification". This study identified 40 distinct communities, 20 biotopes, and 13 broader ecosystems in Manx waters, including areas of horse mussel reef, maerl bed and Ross coral reef.
This survey is the most important recent development in the systematic mapping of the Manx marine environment. Additional information has been collected at a finer resolution by dive surveys carried out by marine biologists and by recreational divers trained in Seasearch methods.

Off the West coast of the island, there is a coarse plain of sands and gravel/shell, which gradually deepens from typically 10-20 m immediately adjacent to the coast, to around 80-90 m at the 12 nautical mile limit. There are two trenches, 120m and 150m deep roughly midway between the Isle of Man and Ireland. Beyond about 5-10 miles west of the Island, the bottom is increasingly muddy, with a community characterised by the burrowing brittle star *Amphiura filiformis*, which can occur at densities of hundreds to thousands per square metre. The deepest area consists of sticky mud that supports a *Nephrops* fishery, although little of this is within the Manx territorial waters. Off the east coast of the island, the seabed is relatively shallow, rarely being deeper than around 30-40 m. The community on much of the seabed within and around Manx waters has been described as "Deep Venus" or "Deep

Venus/hard". The Deep Venus community occurs on coarse sand/gravel/shell sediments, usually at moderate depths (40-100m) and is typified by the urchin *Spatangus purpureus* and robust bivalves such as dogcockle *Glycimeris glycimeris*, *Astarte sulcata*, and a variety of venerid bivalves. Where harder seabed outcrops, or larger stones and boulders occur, typical epifauna such as *Alcyonium digitatum* (dead man's fingers) become more abundant. These coarser seabeds sometimes have dense beds of brittlestars dominated by *Ophiothrix fragilis* that can be very extensive.

Fisheries management areas

In 2012 the "Fisheries Management Agreement between the Fisheries Administrations of the United Kingdom and the Isle of Man", which gave the Isle of Man equal status in fisheries management of its waters as neighbouring jurisdictions, enabled the Isle of Man to become more proactive in fisheries management of the Manx Territorial Sea. The island is known for its innovative sustainable fisheries management, undertaken in collaboration with the fishing community, which has been fundamental to their success.

In terms of conservation of benthic ecosystems, a network of Fisheries Closed Areas and Restricted Areas protects the seabed from scallop dredging in the bays of Port Erin, Niarbyl, Douglas, Baie ny Carrickey and Laxey. These Fisheries Closed Areas protect an area of 21 km^2. In Ramsey Bay, an additional 60km^2 (1.5% of the Manx Territorial Sea) was protected in 2009 as an Emergency Fisheries Closed Area.

Marine Nature Reserve
In 2011 the Island's first Marine Nature Reserve was designated, protecting over 94 km^2 of seabed in Ramsey Bay (2.36% of Manx waters). Management zones within Ramsey Marine Nature Reserve protect eelgrass meadows, horse mussel reefs, maerl beds and kelp forests. These highly protected zones cover an area of 47km^2 (1.18% of the Manx Territorial Sea).

Coastal and intertidal
Manx coastal ecosystems are diverse and are dominated by exposed shores. Around the northern coast, the main ecosystems are sand and shingle shore, whereas the southern coast is dominated by rocky shores and cliffs with a few sheltered sandy beaches. Saltmarsh and mud flats are both very rare ecosystems (see above). For a detailed account of Manx intertidal and coastal ecosystems and species see Hartnoll et al (2013):
http://www.gov.im/media/983571/3.2_coastal.ecol.pdf

Subtidal
Marine ecosystems are also diverse. For full details on bathymetry and hydrology of Manx waters see Kennington & Hiscott (2013):
http://www.gov.im/media/983541/2_1_hydrology_weather_climate_climatology.pdf

14.1.2 Describe the state and trends of the marine ecosystems and/or sea cover types described above and the natural and human drivers of the trends.

As the baseline survey was relatively recent (2008), quantification of trends is difficult. Biotope map – see previous section 14.1.1.

Fisheries
The marine environment is extensively used for commercial and recreational fishing. However, the footprint of fishing is thought to be relatively limited to well-used fishing grounds, leaving substantial areas of the territorial sea relatively little impacted. For example, a recent study of the queen scallop fishery showed that more than 85% of the Territorial Sea was not trawled for queen scallops between 2011 and 2013, and the footprint of the fishery was assessed as less than 12% of the Territorial Sea. Historically, the sea around the island would have been more important for fishing white fish, especially herring. Manx kippers are still smoked and sold, although the fish are sourced further afield.

Although the island is not part of the EU, it has a relationship with the EU through the UK, under Protocol 3 of the Treaty of Accession. The Manx fisheries are thus subject to the Common Fisheries Policy. This is the main human driver of fisheries trends.

Climate change
Climate change is responsible for trends in marine communities. The sea temperature series indicates a 1ºC rise in the last 100 years. A study of Manx king scallop populations showed that higher sea temperatures were linked to better scallop recruitment, suggesting that current increases in sea temperature may be having a positive impact on scallop populations. However, continued increases in sea temperature and changes in ocean chemistry would eventually have a negative impact on scallops, in particular affecting their ability to form shells. Species from warmer water are moving into this part of the Irish Sea. For example, red mullet, cuttlefish and triggerfish are reported to have become more common in Manx waters in the past few decades. The warm water species of barnacles *Chthamalus stellatus* and *Chthamalus montagui* are also seen more often on Manx shores. Increasing sea temperatures will also lead to declines in colder water species at the southern end of their range. For example, the Tortoiseshell limpet (*Tectura (Acmaea) testudinalis*), formerly common at Port St Mary, has not been seen for years.

Invasive species
There is already evidence of marine invasive species occurring in Manx waters, such as wireweed (*Sargassum muticum*), found all around the coast and Pacific oyster (*Crassostrea gigas*), found on Ramsey stone pier walls. The Australasian barnacle *Elminius modestus* has become more common on Manx shores since the 1970s. Other species occur in the region and may become a problem, including the carpet sea squirt (*Didemnum vexillum*) found at Holyhead, Anglesey, Wales.

Offshore developments

The push for renewable energy is attracting investment in offshore wind power and this will have an effect on the marine ecosystems. Other marine developments are likely. Whilst the construction phase of large marine developments like windfarms will have impacts on protected marine species and herring spawning grounds etc., once they are in operation there may also be conservation benefits of windfarms, providing *de facto* protected areas of seabed.

Terrestrial ecosystems

The mapping and statistics follow the recognised UK Phase I mapping system. The land use and ecosystem types for the biosphere reserve are more general.

Figure 12: Breakdown of semi-natural terrestrial vegetation into different ecosystem types

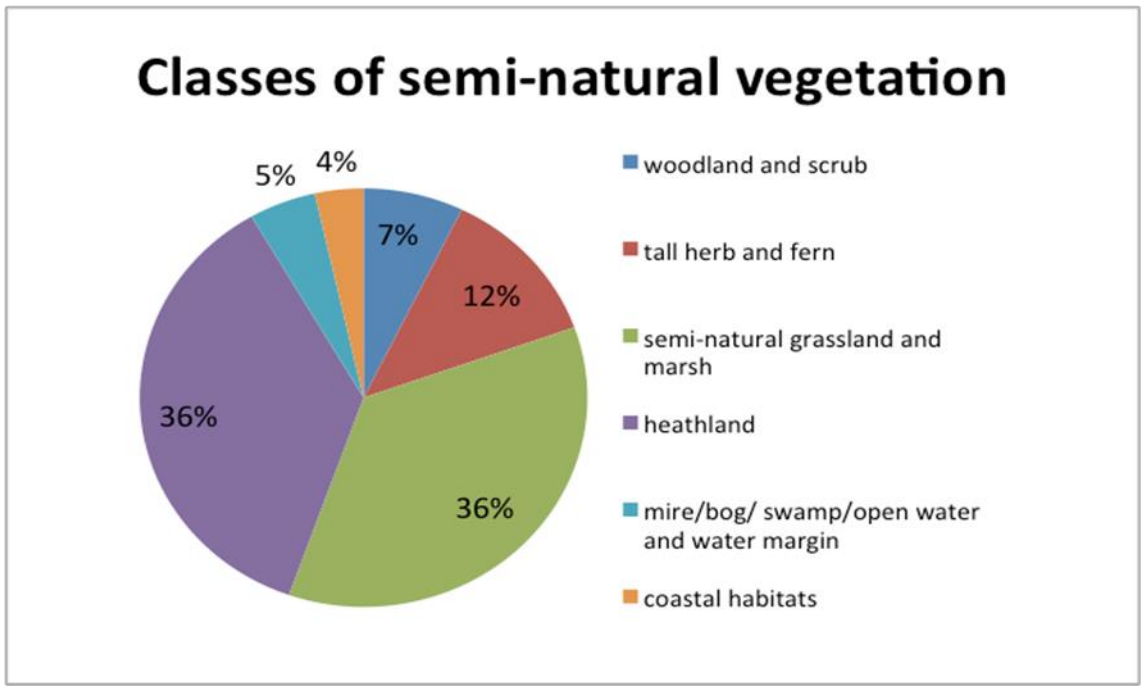
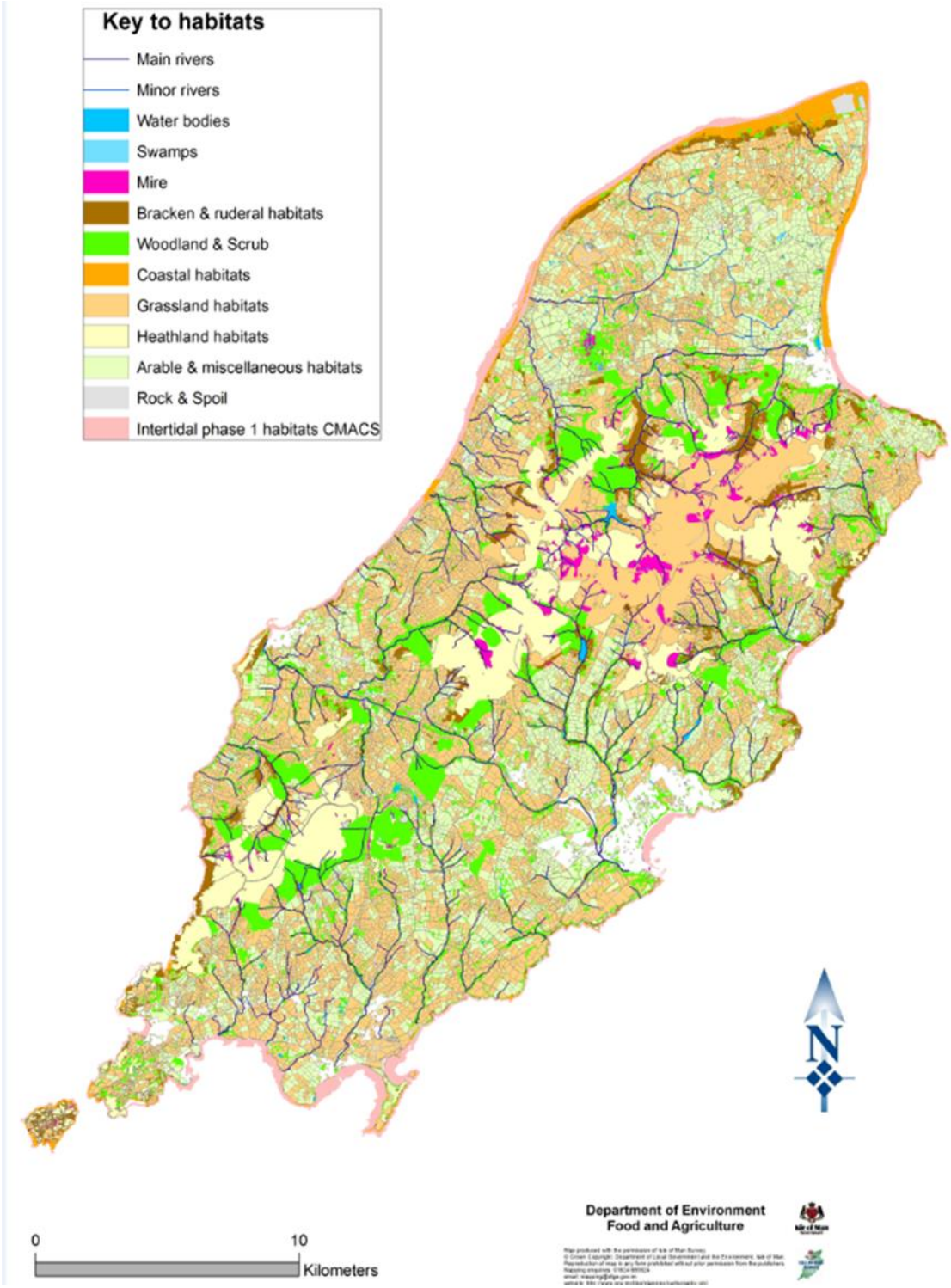


Figure 15: Terrestrial habitat map



Describe and give the location of ecosystems and/or land cover types of the biosphere reserve.

Upland

The Manx uplands are in two blocks, divided by the central valley from Peel to Douglas. They extend to the coast and merge with coast heath and slope habitats south of Peel and north of Douglas. Snaefell at 621m is the highest summit.
The vegetation is a mix of unimproved acid grassland, dry and wet dwarf shrub moor, and mires, such as modified and blanket bog with occasional flushes. Some of these are regionally important ecosystems (EU Habitats Directive Annex 1):

- Dry heath.
- Blanket bog

Around the margins are areas of bracken and improved grassland which, in places, has reverted to wet marshy grassland where it has not been drained. The Sulby valley is notable for broadleaved woodland, some planted (from Manx native sources) and some regenerating naturally from native downy birch (*Betula pubescens*).
The acid grassland is dominated by matgrass (*Nardus stricta*) and has flushes with purple moor grass (*Molina caerulea*). The main dwarf shrubs in the drier moorland are heather and bell heather (*Erica cinerea*) and, where it is wetter, cross-leaved heath (*Erica tetralix*). Where there is no grazing, blueberry (*Vaccinium myrtillus*) thrives but Cranberry (*Vaccinium oxycoccos*) is rare. In places, the wet moorland has a Sphagnum carpet, with cotton grass (*Eriophorum vaginatum*) and bog asphodel (*Narthecium ossifragum*). In a few places at the moorland margin, pale butterwort (*Pinguicula lusitanica*) grows.
Key animal species occurring in the uplands are Hen Harriers *(Circus cyaneus)* The Isle of Man is home to 8% of the estimated 800 pairs across the UK and the Isle of Man which breed and feed there in summer and roost communally in sparsely growing plantations in winter, and curlews *(Numenius arquata).* Red-billed chough (*Pyrrhocorax pyrrhocorax)* feed amongst heather especially near the coast. The Isle of Man is a stronghold for *Pyrrhocorax pyrrhocorax* and currently holds an average of 120 breeding pairs, which equates to approximately 1% of the estimated population for the British Isles. Orchids in the uplands are mainly Heath spotted orchid (*Dactylorhiza ericetorum*). Others may be extinct (e.g. lesser butterfly orchid – *Plantanthera bifolia*) but lesser twayblade (*Listera cordata*), believed extinct as not seen since 1881, was re-discovered in 2009. Least willow (*Salix herbacea*), an arctic alpine species, is only found towards the peak of the highest point, Snaefell.
The main management is sheep grazing; this is governed by the rules of the Agricultural Development Scheme 2015, which prevent ploughing and overgrazing. There is some burning and brush cutting for fire and game management, governed by the Heath Burning Act 2003.
The plantations[1] in the uplands cover 6% of the island (2800 ha), and are of Sitka spruce (*Picea sitchensis*), lodgepole pine (*Pinus contorta*) and European larch (*Larix europeaus*), currently being felled for *Phytophthora ramorum* . At Archallagan, Corsican Pine (*Pinus nigra var maritima*) has been planted and in

[1] http://www.isleofman.com/places-to-visit/countryside/plantations/

Greeba Plantation, the Douglas Fir (*Pseudotsuga menziesii*) is one of the dominant species.
Core areas of this ecosystem are:

- Greeba Mountain and Central Hills ASSI
- Eary vane ASSI
- Glen Rushen ASSI

Semi-natural lowland grassland
This habitat is rare and fragmented, occurring mainly in the northern plain, in association with wetlands or the coast. These tend to be small fields which have escaped agricultural improvement for a variety of reasons, often inaccessibility. Exceptions are the two main airfields (Jurby, an ASSI and Ronaldsway, the main airport) and a small limestone quarry. Some of these are regionally important ecosystems (EU Habitats Directive Annex 1):

- Lowland hay meadows
- Semi-natural dry grasslands and scrubland facies on calcareous substrates

These are grasslands are dominated by secondary grasses such as crested dog's tail (*Cynosurus cristata*), red fescue (*Fescuca rubra*) and sweet vernal grass (*Anthoxanthum odoratum*). They have a variety of broadleaved plants, ox-eye daisy (*Leucanthemum vulgare*), fairy flax (*Linum catharticum*) and, where wet, Devil's bit scabious (*Succisa pratensis*).

The key species associated with them are orchids; greater butterfly (*Platanthera chlorantha),* heath spotted (*Dactylorhiza maculate*), common spotted (*Dactylorhiza fuchsia),* common twayblade (*Listera ovata)*, bee (*Ophrys apifera)*, and pyramidal (*Anacamptys pyramidalis).* There are also corncrakes (*Crex crex*), and skylarks (*Alauda arvensis*) breeding on the airfields.
Many of these fields are in hay meadow management, though others are grazed by cattle or sheep. The limestone quarry is ungrazed and kept free from scrub by hand.

Core areas of this ecosystem are:

- Jurby Airfield ASSI
- Ballacrye meadow ASSI
- Parts of Ballaugh Curragh ASSI
- Rosehill Quarry ASSI
- Parts of Dalby Coast ASSI
- Ballachurry meadows ASSI
- Ballateare meadow (Consortium Field) ASSI
- Cronk y King ASSI

Lowland heath and mire
The main areas of lowland heath are at the Ayres, which has lichen heath with several *Cladonia* spp and *Usnea articulata* growing terrestrially, even though it is normally an epiphyte. Coastal heath is found at a range of altitudes around the island, merging with upland heath at the coast. It occurs in association with coastal grassland and scrub. This category includes mires, lowland peatland such as Curragh, areas of willow carr and purple moor grass (*Molinia caerulea)*

grassland on peat. The Ayres heathland is used by nesting skylarks, curlew and oystercatchers.
Some of these are regionally important ecosystems (EU Habitats Directive Annex 1):

- Coastal dune heathland
- Wet heath with cross-leaved heath
- *Molinia* meadows

They are dominated by heather, bell heather and western gorse (*Ulex gallii*) with wild thyme (*Thymus polytrichus*) and many other small herbs. Invertebrates such as heath beefly (*Bombylius minor*) and scarce crimson and gold moth (*Pyrausta sanguinalis*) as well as grayling butterflies (*Hipparchia semele*) occur. Heathland with poor conifer growth is important for roosting hen harriers and breeding short-eared owls.

Often these areas are unmanaged, but in places they are grazed by sheep. Scrub clearance, especially European gorse is important for maintaining some lowland heath. Rheophilous Lowland mires may become overgrown with willows.

Core areas of this ecosystem are:

- Ayres National Nature Reserve
- Langness, Derbyhaven and Sandwisk ASSI
- Maughold Cliffs and Broughs ASSI

Dalby Mountain and Stoney mountain also important areas for these habitats

Broadleaf Woodland (Wooded glen)
The glens are mostly in wooded valleys radiating out from the uplands. Several come right down to the coast. Some still have relics of native woodland (e.g. Sulby, Narradale and Dhoon Glens). Most have broadleaved plantation dating from Victorian times, with small areas of conifers. The native trees of the most natural glens include sessile oak (*Quercus petraea*), aspen (*Populus tremula*), ash (*Fraxinus excelsior*), wych elm (*Ulmus glabra*), downy birch (*Betula pubescens*) and rowan (*Sorbus aucuparia*). Beech (*Fagus sylvestris*) sycamore (*Acer pseudoplatanus*) and Scots pine (*Pinus sylvestris*) have commonly been planted. The understory and ground flora show signs of long-established woodland sites, with hazel (*Corylus avellana*), honeysuckle (*Lonicera periclymenum*), wood sanicle (*Sanicula europea*) and wood anemone (*Anemone nemorosa*). The ash black slug (*Limax cinereoniger*) has been found in this habitat.
The relic oak woodland ecosystem is a regionally important ecosystem (EU Habitats Directive Annex 1):

- Western acidic oak woodland

These areas are much used for informal recreational use.
Core areas of this ecosystem are:

- Dhoon Glen ASSI
- Glen Maye ASSI
- Parts of Santon Gorge and Glen Soldrick ASSI

Wetland
Wetland on the island includes curragh, rivers, streams, ponds and reservoirs. The rivers and streams are mainly of upland character, with the longest being the River Sulby on which there is a water supply reservoir. Slower watercourses include highly managed trenches in the north. These have emergents such as reed (*Phragmites australis*) and are important for such birds as sedge warblers (*Acrocephalus schoenobaenus*). The larger water bodies are mainly man-made: quarries, of which several are limestone, flooded gravel pits in the north, and reservoirs in the hills. These can be good for birdlife (such as Eairy Dam with a healthy population of coot, *Fulica atra*) and the Ayres gravel pit (important for migratory wildfowl). Ponds and dubs occur on farmland and some originate from pingos left by the retreating ice sheet. Some of these dubs are important for rare plants; penny royal (*Mentha pulegium*) a Red Data Book Species, greater spearwort (*Ranunculus lingua*), Iceland cress (*Rorippa icelandica*) and golden dock (*Rumex maritimus*). They also have a range of invertebrates including dragonflies, damselflies, spiders and water beetles.
The wetlands include wet grassland, wet scrub, and wet woodland.

Some of these are regionally important ecosystems (EU Habitats Directive Annex 1):
- Acid peat-stained lakes and ponds
- Alder woodland on floodplains

Some wetlands are grazed, but most are not managed intensively. Watercourses are managed to prevent flooding and assist migratory fish. Ponds need management to keep them open.
Core areas of this ecosystem are:
- Ballaugh Curragh ASSI
- Quarry pools in Rosehill Quarry ASSI
- Watercourse in Santon Gorge and Port Soldrick ASSI
- Watercourse in Dhoon Glen ASSI
- Watercourse in Glen Maye ASSI
- Ayres Gravel Pits (Bride) Area of Special Protection for birds.

Rural communities and farmland
There is a scatter of communities, villages and hamlets throughout the lowlands. Many properties have gardens which are important for wildlife. Most of the grassland is improved, ryegrass (*Lolium perenne)* or ryegrass and clover (*Trifolium repens*) sward. This is normally in rotation with barley for animal feed or a cruciferous fodder crop. Manx sod hedges are the most important feature of farmland. These vary considerably but are normally stone-faced walls with turf on top. Some are covered in trees and shrubs: European gorse (*Ulex europaeus*) is very common. Others have grazed turf and can be species-rich or heathy. Road verges also carry some important semi-improved or unimproved habitats (grassland and heath). Mixed hedgerows without banks are only found in the north, where the verges are wider. Farm buildings are important for swallows *(Hirundo rustica),* starlings *(Sturnus vulgaris),* barn owls *(Tyto alba)* and bats

Urban centres

The main towns are around the coast and most have a harbour and river mouth. Port St Mary, Kirk Michael and Port Erin do not have significant watercourses nearby. Gardens are good for woodland birds and insects, such as bees and butterflies. The buildings themselves may have swifts *(Apus apus),* swallows *(Hirundo rustica),* house martins *(Delichon urbicum)* and bats (*Chiropetera* species) in them.

The coast is the only area likely to be included in the core area close to the urban centres.

- Ramsey Mooragh Shore ASSI
- Port St Mary Ledges and Kallow point ASSI

14.1.2 Describe the state and trends of the terrestrial ecosystems and land cover types described above and the natural and human drivers of the trends.

Upland
Some have good moss cover and well-grown dwarf shrubs, but others are less species-rich due to extensive grazing by sheep and lack of intense burning. Other areas are intensively burned and grazed for sheep and red grouse. There is interest in increasing the red grouse population by introducing grouse for shooting, but there has been no grouse shooting for more than a decade. Some moor grip blocking has been done by the forestry division of DEFA to improve moorland health. Small areas are affected by hill peat cutting (turbaries), although only one turbary site remains.

An upland management strategy is under discussion, following a report produced in 2014.[2]

Semi-natural lowland grassland
This is a scarce and highly threatened habitat in the UK. It is thought very little of the post-war acreage remains within the Isle of Man. A comparable percentage to the UK, approximately 90%[3], has been agriculturally improved and has lost its diversity of plants and animals, mainly invertebrates. Many protected species are associated with it, so action plans for these include important grassland protection and management. Hay is still cut on some of these fields, but the vagaries of Manx weather can make this a difficult crop to harvest. Improved drainage on lowland farmland generally is likely to be affecting the wetter semi-natural grasslands.

Lowland heath and mire
Much of this is under protective designation (ASSI or NNR) or ownership. Surrounding land drainage and diffuse pollution by nitrates can be a risk to the acid condition of the sites. In addition, natural vegetation succession is taking

[2] https://www.gov.im/about-the-government/departments/environment-food-and-agriculture/forestry-amenity-and-lands-directorate/manx-upland-strategy/

[3] http://uknea.unep-wcmc.org/Resources/tabid/82/Default.aspx

some sites from wet heath to wet woodland. Pools gradually fill in and grow over, reducing the habitat diversity of places such as Curragh. The mechanical deepening of trenches, drains and watercourses is likely to be affecting the water table and biodiversity in the north of the island.

Wooded glen
The glens are vulnerable to invasive non-native species, *Griselinia littoralis* does self-sow on the island. Fragments of *Fuchsia magellanica* root and spread. Japanese knotweed (*Fallopia japonica*) is fairly well established in at least one glen.

Wetland
A new Watercourse Management Manual has been produced by Manx Utilities to guide the owners of the privately managed watercourses. Bank erosion is a problem which is evident after heavy rain when silt flows out into bays from the rivers in spate.

Ponds and dubs are vulnerable to becoming overgrown and silted up. Others have been lost to dumping of materials and infilling with inert waste. However, new ponds and small lakes are being dug. Many of these have feral ducks and geese. Others have had coarse fish introduced into them.

Curragh has attracted high land prices for lifestyle land, for keeping hens, horses, ducks and other animals. Other areas have been cleared for land-based businesses.

Rural communities and farmland
This land cover type is affected by agricultural support schemes and the profitability of agriculture. Extensive areas are amenity grassland and sports areas, mown all summer. Motor bike activities are very popular, and one off events and regularly used courses are widespread. Green Lanes and Greenway Roads are open to motor traffic with a 20 miles per hour (32 kph) speed limit.

Urban centres
New housing has led to the rapid expansion of the towns into the surrounding countryside. The human population of the Island grew 70% between 1960 and 2010. More environmentally sustainable materials have been used recently, leading to better energy efficiency in homes.

14.1.3 What kind of protection regimes (including customary and traditional) exist for the core area(s) and the buffer zone(s)?

Table 13: Terrestrial Protection Regimes

Designation	Ownership	Area (ha)	Conservation objectives
Terrestrial		Areas from designation documents	
Ayres National	Department	272.32	A National Nature Reserve is

Nature Reserve*. National Nature Reserve under Wildlife Act 1990	of Environment, Food and Agriculture (DEFA) and Manx National Heritage (MNH)		managed for the purpose: *(a) of providing, under suitable conditions and control, special opportunities for the study of, and research into, matters relating to the fauna and flora of the Island and the physical conditions in which they live, and for the study of geological and physiographical features of special interest in the area, or* *(b) of preserving flora, fauna or geological or physiographical features of special interest in the area,* *or for both those purposes.* The Ayres National Nature Reserve is designated for the protection of lichen heath, little terns, breeding and feeding waders (lapwings), linnets and skylarks.
Wetland of International Importance, Ballaugh Curragh	Various including Department of Infrastructure (DoI), MNH, DEFA, Manx Wildlife Trust (MWT), private	193.4	This site was designated as a Wetland of International Importance under the Ramsar Convention in 2006. The purpose of the ASSI is to formalise the protection of an area which is important for its fauna, flora, geology, geomorphology and landscape.
Greeba Mountain and Central Hills ASSI	DEFA owned, rented out	1080.95	The purpose of this designation is to formalise the protection of an area which is important for its assemblage of upland breeding birds, and its upland wildlife habitats – dwarf shrub heath (heather moorland), acid grassland, mire (including blanket bog and acid hillside flushes), and river catchment.
Central Ayres ASSI* (same area as NNR)	DEFA and MNH owned	358.34	The purpose of this designation is to extend the protection of an area which is important for its coastal habitats: intertidal shingle, gravel and sand, vegetated shingle and decalcified fixed dunes with dune heath and grassland. The area also supports important populations of rare and protected breeding and visiting wild birds, nationally threatened and vulnerable invertebrates and rare and

			protected plants including one (UK) nationally vulnerable species. This Notification applies to the old designation boundary plus an extended area of approximately 98 ha, which includes the intertidal zone adjacent to the old boundary, plus contiguous areas of dune heath and grassland. These were not included at the time of the previous designation, but are now known to have a high wildlife importance and form an integral part of the same ecosystem. This is therefore a formal revision, replacing the previous Central Ayres ASSI notification.
Langness, Sandwick and Derbyhaven ASSI*	DoI shoreline, and private	310	The purpose of this designation is to formalise the protection of an area which is important for its fauna, flora, geology, geomorphology and landscape.
Dalby Coast ASSI*	MNH	62.1	The purpose of this designation is to formalise the protection of an area which is important for its geology, flora and wildlife habitats: species-rich meadow, hard coastal cliffs and slopes, coastal grassland, neutral flush, reedbed, vegetated shingle and intertidal habitats.
Maughold Cliffs & Brooghs ASSI*	MNH	53.63	The purpose of this designation is to formalise the protection of an area which is important for its breeding avifauna and semi-natural coastal habitats; hard cliffs and slopes, coastal grassland, acid grassland and scrub.
Jurby Airfield ASSI	DoI	63.04	This site is designated for its semi-improved neutral grassland of the type crested dog's-tail and knapweed *Cynosurus cristatus* - *Centaurea nigra* lowland hay meadow.
Pooil Vaaish Coast ASSI*	Private, inter-tidal DoI	44.76	The purpose of this designation is to formalise the protection of an area which is important for its

			breeding and visiting birds and its intertidal, saltmarsh, vegetated strandline, vegetated shingle and coastal grassland habitats.
Santon Gorge & Port Soldrick ASSI*	Private, inter-tidal DoI	24.35	Santon Gorge is situated on the boundary between carboniferous limestone and Manx slate and is an important site primarily for the semi-natural woodland that exists on the gorge cliffs on either side of the Santon Burn. The woodland exists in association with many other habitats including scrub, coastal grassland, species-rich neutral marsh, coastal grassland and flushes and saltmarsh as well as an extensive area of inter-tidal habitat. These habitats support a large number of breeding birds.
Dhoon Glen ASSI* (Manx National Glen)	DEFA	20.92	The purpose of this designation is to formalise the protection of an area which is important for its flora and wildlife habitats: broadleaved woodland, mixed plantation, open water, strandline and shingle.
Cronk y Bing ASSI*	MWT (and DEFA)	7.3 (+10.41)	The purpose of this designation is to formalise the protection of an area which is important for its wildlife habitat: soft cliffs, dunes and coastal grassland.
Glen Maye ASSI* (Manx National Glen)	DEFA	15.92	The purpose of this designation is to formalise the protection of an area which is important for its flora and wildlife habitats: broadleaved woodland, mixed plantation, coastal scrub, open water, hard coastal cliffs and slopes, coastal grassland and intertidal habitats.
Port St Mary Ledges & Kallow Point ASSI*	Local Authority and DoI Inter-tidal areas	14.79	The purpose of this designation is to formalise the protection of an area which is important for its matrix of maritime habitats, principally its intertidal limestone ledges featuring distinctive zonation from the eulittoral zone to the sublittoral zone, vegetated shingle, hard cliff and coastal

			grassland habitats. The site also hosts a number of important breeding and visiting bird species.
Glen Rushen ASSI (Manx National Glen)	DEFA	12.27	The purpose of this designation is to formalise the protection of an area which is important for its habitat: wet unimproved acid grassland, valley mire and flush, developing native broadleaved woodland, river valley and streams.
Eary Vane ASSI	DEFA	3.96	The purpose of this designation is to formalise the protection of an area which is important for its habitat: species-rich rush pasture of the Sharp-flowered rush and Marsh bedstraw *Juncus acutiflorus – Galium palustre* type, with Purple moor-grass and Tormentil *Molinia caerulea - Potentilla erecta* mire.
Cronk e King ASSI	Private	3.02	This site is designated for its species-rich neutral grassland dominated by sweet vernal grass *Anthoxanthum odoratum*.
Rosehill Quarry, Billown ASSI	Private	1.37	The purpose of this designation is to formalise the protection of an area which is important for its flora and habitat – open water, swamp vegetation, limestone grassland and scrub.
Ballateare Meadow (Consortium Field) ASSI	Private	0.96	This site is designated for its neutral grassland dominated by sweet vernal grass *Anthoxanthum odoratum* with Yorkshire fog *Holcus lanatus*.
Ballacrye Meadow	Private	0.55	The purpose of this designation is to formalise the protection of an area which is important for its flora and habitat: species-rich rush pasture of the *Juncus acutiflorus – Galium palustre* (Sharp-flowered rush and Marsh bedstraw) type.
Ramsey Mooragh Shore ASSI*	Ramsey Town Commissioners/DOI	2.65	The purpose of this designation is to formalise the protection of an area which is important for its flora and habitat – vegetated strandline, vegetated shingle, semi-fixed dune and coastal

			grassland.
Ayres Gravel Pits, Areas of Special Protection for birds under Wildlife Act 1990	Private ownership	39.97	Bird conservation. 1 site has been designated.
Local nature reserves (where also ASSIs) Goshen, Moaney & Crawn's Meadows, Close Umpson, Close Sartfield, Ballachrink	Manx Wildlife Trust	41	Protection, conservation and enhancement of natural habitats for the benefit of the Island's biodiversity, as well as for public education and enjoyment. Managing public access as appropriate.
Calf of Man, Reserve and Bird Observatory	Manx National Heritage, wardening managed by Manx Wildlife Trust	250	Natural and cultural heritage conservation, bird monitoring (Bird Observatory), public enjoyment and education.
Total		3,276 ha	There is some overlap of designations and some have inter-tidal areas.
Marine			
Marine Nature Reserve under Wildlife Act 1990	Government ownership (DOI)	9,371	A Marine Nature Reserve *should be managed by the Department (DEFA) for the purpose of-* *(a) conserving marine flora or fauna or geological or physiographical features of special interest in the area; or* *(b) providing, under suitable conditions and control, special opportunities for the study of, and research into, matters relating to marine flora and fauna and the physical conditions in which they live, or for the study of geological and physiographical features of special interest in the area,* Ramsey Bay MNR is designated for the protection of important habitats including eelgrass meadows, maerl beds, horse mussel reef and kelp forests, protection and enhancement of ecosystem services and sustainable fisheries.
Ramsey Marine Areas: Moderate Protection: Zone 1: Conservation Zone	Government ownership (DOI)	1501.51	Zone 1: Conservation Zone, moderate protection
Ramsey Marine Areas: High	Government ownership	3084.83	Zone 2: Horse Mussel Zone, high protection

Protection: Zone 2: Horse Mussel Zone	(DOI)		
Ramsey Marine Areas: Very High Protection: Zone 3: Eelgrass Zone	Government ownership (DOI)	51.49	Zone 3: Eelgrass Zone, Very high protection
Ramsey Marine Areas: Low Protection (Managed under MFPO Seabed Lease): Zone 4: Fisheries Management Zone	Government ownership (DOI), managed by MFPO.	4580.73	Zone 4: Fisheries Management Zone, low protection, managed under MFPO seabed lease.
Ramsey Marine Areas: Zone 5	Government ownership (DOI)	152.72	Zone 5, Rocky Coast Zone. Voluntary agreement in MFPO leased zone.
Fisheries Closed or Restricted Areas under Fisheries Act 2012	Government ownership (DOI)	2,927	Promoting sustainable fisheries by providing replenishment areas for scallops and protecting important habitats.
Baie ny Carrickey	Government ownership (DOI)	1135.68	Management of potting in Bay managed by Baie Ny Carrickey Crustacean Fishery Management Association
Niarbyl Restricted Area	Government ownership (DOI)	608.59	Scallop replenishment/nursery function
Douglas Closed Area	Government ownership (DOI)	432.33	Scallop replenishment/nursery function
Laxey Restricted Area	Government ownership (DOI)	391.37	Scallop replenishment/nursery function
Port Erin Closed Area	Government ownership (DOI)	451.03	Scallop replenishment/nursery function
Total		12,390 ha	Closed & managed bays + Ramsey MNR

*Denotes coastal ASSI and hence may also include inter-tidal areas.
ASSIs can be designated on land and on inter-tidal areas down as far as Lowest Astronomical Tide Mark, and therefore small areas of core may be double counted if Marine Protected Areas also apply to these areas which includes areas to high tide level.

ASSIs and other sites under statutory conservation measures and ownership are subject to government management and protocols in place from time to time to ensure appropriate management is in operation.

Table 14: Buffer Zone(s) Protection Regime(s)

Buffer zone areas	**Protection regimes**
16 Manx National Glens	Owned and/or managed for biodiversity and amenity/public

	access by the Department of Environment, Food and Agriculture. Two glens are ASSI's and therefore included in the Core.
Manx National Heritage land	1,550 ha managed for their cultural and natural heritage, excluding areas which are core areas (notably Ballaugh Curragh, Calf and Ayres). Falls under the Manx Museum and National Trust Act 1959. Subject to byelaws.
DEFA owned uplands	13,000 ha. Open access and covered by farming and shooting tenancies, subject to good management practice conditions as well as cross-compliance rules of Countryside Care Scheme in the case of farmers, and Heath Burning Code (2010) in the case of farmers and shooting tenants.
Manx Wildlife Trust owned land (not ASSIs)	Ownership of reserves by Manx Wildlife Trust is covered in their Memorandum and Articles of Association; *To establish, form, own and manage bird sanctuaries or nature reserves for the conservation and control of wild plants and other vegetation and of the wild creatures of any description living naturally therein.* (Clause 3.II)
All terrestrial buffer zone	"Isle of Man Strategic Plan – Towards a Sustainable Island" covers any development planning proposals on land, not covered by Permitted Development Orders. Strategic Policy 2 states New Development will be located primarily within our existing towns and villages, or where appropriate in sustainable urban extensions of these towns and villages. Development will be permitted in the countryside only in exceptional circumstances.
Farmland	Section 30 (Wildlife Act 1990) Management Agreements are offered to land managers as incentives for positive management where protected species occur, subject to budget constraints. Farmland under the Countryside Care Scheme is subject to cross-compliance rules which requires that farmers keep land in Good Agricultural and Environmental Condition. Standards can be found with this link. https://www.gov.im/media/277691/cross_compliance_standards.pdf All land owners are offered Stewardship packs containing all codes of good practice for land management.

Table 15: Terrestrial and Marine Buffer Zone(s)

Terrestrial	**Legal status Ownership**	**Size (ha)**	**Activities ongoing and planned**
Uplands	In Government ownership and grazing and	5,200 (8,000 -2800 plantation	Tenanted to sheep farmers and game managers, use for recreation: walking, wildlife

	shooting tenancies	area)	watching, mountain biking, motorised vehicles.
Plantations	Owned by DEFA, across 50 blocks	2800 DEFA plantation listing – 55 plantations across the island,	Managed by DEFA to supply the sawmill for wood products, biomass fuel etc., and public recreation. Scope to increase public access and utilisation.
Heritage land (where not already accounted for above)	Owned by Manx Museum and National Trust , formal name of Manx National Trust	890	Leisure use, education and land management for biodiversity and archaeology.
Glens (excluding those designated as ASSI) Manx National Glens extending to around 1,000 acres: Ballaglass Glen Ballure Walk Bishopscourt Glen Bradda Glen & Head Colby Glen Elfin Glen and Claughbane Walk (leased from Ramsey Commisioners) Glen Helen Glen Mooar Glen Wyllin Groudle Glen (leased from Onchan Commissioners) Laxey Glen Lhergy Frissel Molly Quirk's Glen and Bibaloe Walk Port Soderick Glen Silverdale Glen (part leased) Tholt y Will Glen	Owned by DEFA	400 approx.	Management for biodiversity and public recreation
Local nature reserves (where not also ASSIs) Ballamoar Meadow,	MWT	71	Protection, conservation and enhancement of natural habitats for the benefit of the Island's biodiversity, as well as

Ballalough Reedbeds, Barnell Reservoir, Breagle Glen and Cronk Aash, Close e Quayle, Cooildarry, Curragh Feeagh, Curragh Kiondroghad, Dalby Mountain, Dalby Mountain Fields, Dobby's Meadow, Earystane, Fell's Field, Lough Cranstal, Glen Dhoo, Miss Guyler's Meadow.			for public education and enjoyment. Managing public access as appropriate.
Field Gazetteer land, inc. including farmland		39,899	Land under statutory management requirements for landowners, for some of whom cross-compliance rules of the Countryside Care Scheme would apply.
Total		46,500 ha	
Marine			
Intertidal and 0-3 nautical mile zone outside of Core marine areas	Owned by Isle of Man Government (Department of Infrastructure)	68,107	Measures in place for sustainable fisheries management and marine species and ecosystem conservation. Marine planning and development consenting in progress.

Definition below is as used in Strategic Plan for Areas Defined as of High Landscape Value/Scenic Significance

'Coastal areas, wooded valleys, valleys with potential for landscape improvement, glens, curraghs an dareas frequented by residents and and tourists on account of their scenic beauty, historic or scientific value, are marked on the Development Plan with diagonal red hatching. Development in these areas will require special consideration and particular attention should be paid to the design and siting of agricultural buildings and indeed of any structure. Efforts should be made to ensure the undergrounding of electricity and telephone cables, and where road widening schemes are necessary, the character of the traditional Manx highway should be preserved as far as possible by the use of appropriate materials and by the purchase of sufficient land to permit adequate landscaping and tree planting. Amenity tree planting and the practice of good forestry is of great importance in these areas, which contain a high proportion of the Island's mature hardwoods. It is felt a

concentration of effort on those areas which can be seen from the main roads could produce favourable improvements to the Island's 'shop window' out of all proportion to the limited investment required.'

Marine core areas
The Marine core areas are all protected as some form of Marine Protected Area:

Table 16: Marine Protection Regime(s)

Ramsey Bay Marine Nature Reserve	Ramsey Bay and the Ballacash Channel are protected as a zoned Marine Nature Reserve. The protection levels vary from a seasonal No-Take Zone to a Fisheries Management Area that is protected from a wide range of impacts and managed by the local fishermen's organisation for sustainable fisheries. Protection is conferred by the Wildlife Act 1990 (S. 32).
Port Erin Bay Closed Area	Designated under Fisheries Act 2012. This well-studied area has been closed to scallop dredging since 1989.
Douglas Bay, Laxey Bay and Baie ny Carrickey Closed Areas	These Fisheries Closed Areas are closed to scallop dredging and protected under the Fisheries Act 2012.
Laxey Bay and Niarbyl Bay Restricted Areas	These Fisheries Restricted Areas are closed to scallop dredging and protected under the Fisheries Act 2012

Marine Buffer
The 0-3 nautical mile (nm) limit has been agreed as buffer with the Manx Fish Producer's Organisation. This is protected through the fisheries regulation and legislation.

Scallop fishery

The Manx Queenie (queen scallops) fishery achieved Marine Stewardship Council certification in 2011, suspended in 2014, due to harvesting above Total Allowable Catch levels, to allow stock recovery, prior to intended re-certification. A reason for enhanced sustainability recognition is because the queen scallops are not dredged but trawled with an otter trawl which does less damage to the seabed community. Another positive credential for fisheries management within the Isle of Man is the existence of Fisheries Closed Areas for stock replenishment.

A queen scallop management byelaw, introduced in August 2010, established new harvest control rules and tools. These include restrictions on type of fishing gear that can be used, the areas where certain gear can be used, the power of vessels, a new Minimum Legal Landing Size for queen scallops, new monitoring requirements, and also a provision for setting a Total Allowable Catch (TAC) for the fishery (set using scientific advice from University of Bangor). There are different rules for 1-3 nm (buffer) compared with 3-12 nm (transitional) for width of dredges, size of boat and hours when fishing is permitted.

Fishing for queen scallops in the Isle of Man Territorial Sea is now prohibited from 1st April to 31st May, but the main fishery is in the summer months when

the boats are unable to undertake the generally more lucrative king scallop fishery. There is a closed season for king scallop fishing from 1st June to 31st October, and this includes landings by divers.

Protection regimes
All vessels of >10 m in length in the 0 - 3 nm zone are now fitted with Vessel Monitoring System (VMS) transceivers, and in the 3 – 12 nm zone all vessels >15 m have VMS. To date, the VMS data has been used to map the distribution of fishing activity within the Isle of Man territorial sea. This enables better fisheries management through understanding how intensively the different areas are fished.

Recently there has been an increasing interest and harvest of the Common Whelk *(Buccinum undatum)*, caught in specialised pots. This is a harvest that does not have a quota under the Common Fisheries Policy, and which is being monitored by the Isle of Man and Bangor University to better understand what the Maximum Sustainable Yield would be.

Other aspects of marine sustainability
The Isle of Man is an active participant in the KIMO Fishing for Litter project. Kommunenes Internasjonale Miljøorganisasjon (KIMO) was founded in Esbjerg, Denmark, in August 1990 to protect, preserve and enhance northern Europe's oceans. This is a successful initiative whereby fishermen are encouraged to bring ashore debris that has been caught up in their fishing nets. It is disposed of on land rather than returning it to the sea where it would cause further problems. The scheme has been recognised by the United Nations Environment Programme as a tool to reduce marine litter. The project provides fishermen with bags so that marine litter can be easily collected, landed and deposited in lockable bins located at participating harbours: Douglas, Peel, Ramsey and Port Erin.

14.1.4 Which indicators or data are used to assess the efficiency of the actions/strategy used?

For the conservation objective, it is proposed to gather information for biodiversity indicators across a range of nature conservation sites, protected landscapes/seascapes, priority ecosystems and species. These biodiversity indicators are being developed and will broadly be similar to the equivalent indicators from UK ("Biodiversity Indicators in Your Pocket"), including breeding bird trends. There has been an assessment of the datasets available, and recommendations will be made on the indicators for each Strategic Objective of the Biodiversity Strategy, concentrating on direct indicators of biodiversity change.

On land

Core

ASSIs are visited regularly as part of ongoing management and consenting discussions.

Regular monitoring of the Ayres National Nature Reserve (monitoring of birds including little terns, rare plants, ecosystem change and water levels).

Buffer

Population counts take place regularly for key species (peregrine (*Falco peregrinus)*, chough (*Pyrrhocorax pyrrhocorax*), hen harriers (*Circus cyaneus*). Regular monitoring is done for other species (lesser mottled grasshopper, *Stenobothrus stigmaticus*). Where DEFA has a management agreement with owners for orchid management, population estimates are undertaken.

MWT reserves are regularly surveyed and monitored. Given that the majority of the terrestrial Isle of Man is under a form of land management, it is appropriate to refer to management methods to assess compliance the statutory requirements. For land owners receiving payments for agricultural activity, farms are inspected to ensure that applicants to the Countryside Care Scheme are meeting cross compliance standards, and the voluntary Biosphere Isle of Man Code of Practice for landowners (Appendix 4), see section 15.3.4.

In the sea

The Fisheries Directorate of the DEFA has the facilities to collect high-resolution benthic information from the fisheries protection vessel MV Barrule. In 2011, a detailed survey of Ramsey Bay was carried out from the vessel to produce a baseline for future monitoring of the effectiveness of the Ramsey Marine Nature Reserve. The survey used a combination of ground discrimination equipment, towed video camera, and sediment grabs.

Whilst Manx waters have now been relatively well studied, gaps in knowledge remain. New horse mussel reefs and eelgrass meadows continue to be discovered as more survey work is carried out. This highlights the importance of targeted benthic survey work to support any Environmental Impact Assessments in Manx waters.

Manx Basking Shark Watch and the Manx Whale and Dolphin Watch operate public sightings schemes for marine megafauna (basking sharks, whales and dolphins). In addition, there has been some systematic survey of whales and dolphins.

The Manx Wildlife Trust also provide a service on behalf of DEFA to report any strandings of marine megafauna. Training has also been organised and provided via MWT and British Divers Marine Life Rescue. The course provided trainee medics all the basic information needed to be able to assess the condition of animals on the beach, give them first aid, handle them safely and in the case of the whale and dolphin, refloat them.

Monitoring plans are in place for all the marine core areas to assess scallop populations, ecosystem health and other aspects. MSC accreditation of the Isle of Man Queenie Scallop *(Aequipecten opercularis)* fishery is currently suspended until stock recovery is sufficient to allow full stock harvesting to resume. Marine stocks are monitored with assistance from Bangor University.

14.2 At the level of species and ecosystem diversity:

14.2.1 Identify main groups of species or species of particular interest for the conservation objectives, especially those that are endemic to this biosphere reserve, and provide a brief description of the communities in which they occur.

No endemic species occur in the proposed biosphere reserve. A number of species were first described from Manx waters but have since been found elsewhere. For example, the two species of sea slug (nudibranch) *Doto sarsiae* and *Doto hydrallmanaie* were found to be separate species feeding on two different species of hydroid, when they had previously been thought to be the species *Doto coronata*.

Three species which also occur elsewhere bear the Manx name either in the common English or scientific names: Manx shearwater (*Puffinus puffinus),* Manx robber fly *(Machimus cowini),* and Isle of Man cabbage (*Coincya monensis*).

Some species are only found at single sites. Examples are: agrimony (*Agrimonia eupatoria)*; ivy leaved bellflower (*Wahlenbergia hederacea)*; Isle of Man cabbage (*Coincya monensis* ssp *monesis)*; spring sandwort (*Minuatia verna).*

Significant breeding birds include: hen harrier *(Circus cyaneus),* which colonised the Isle of Man during the 1970s; chough (*Pyrrhocorax pyrrhocorax*) in large numbers; corncrake (*Crex crex*) although not heard since 2008; Manx shearwater (*Puffinus puffinus),* small numbers of which nest on the Calf; and little tern (*Sternula albifrons),* with one nesting colony at the Ayres. The rarest birds are specially protected and listed on Schedule 1 of the Wildlife Act. The Manx Bird Atlas was published in 2007 after a detailed survey of the island's breeding and visiting birds.

The island has few terrestrial mammals. Eight species of bats (*Microchiroptera*) are found, as well as stoats (*Mustela ermine)*, feral polecat ferrets (*Mustela lutreola x putorius*)and introduced or reintroduced brown and mountain hares (*Lepus europaeus, L. timidus)* and hedgehogs (*Erinaceus europaeus)*. Native amphibians are believed to be limited to one species, common frog (*Rana temporaria)* and the terrestrial reptiles to common lizard (*Lacerta vivipara).*

Salmon (*Salmo salar)*, brown trout (*Salmo trutta)*, eel (*Anguilla anguilla)*, brook lamprey (*Lampetra planeri)* and river lamprey (*Lampetra fluviatilis)* occur in the rivers, which are mainly upland in character.

The marine mammals which occur around the Isle of Man are Risso's dolphins (*Grampus griseus)*, common and bottlenose dolphins (*Tursiops trunctus*, *Delphinus delphis*), harbour porpoises (*Phocoena phocoena)* and minke whales (*Balaenoptera acutorostrata)* being seen regularly. Other whales are seen occasionally or rarely.

There are several important invertebrates. The only site for lesser mottled grasshopper (*Stenobothrus stigmaticus)* in the British Isles is on Langness. Scarce crimson and gold moth (*Pyrausta sanguinalis)* and heath or lesser beefly

(*Bombylius minor)* occur on the Ayres. There are several species of butterfly that have recently colonised, including the speckled wood (*Pararge aegeria)* and comma (*Polygonia c-album)*, which are expanding their UK range.

Figure 16: The Scarce Crimson and Gold Moth *(Pyrausta sanguinalis):*

Key species of particular interest in these ecosystems

1. **Shallow marine ecosystem**: eelgrass, maerl, horse mussels, basking shark, Risso's dolphins and harbour porpoise.

Eelgrass meadows - Eelgrass (*Zostera marina*) is an OSPAR Threatened/Declining species and is listed as a protected species in the Wildlife Act 1990. Eelgrass is protected within Ramsey Marine Nature Reserve and Laxey Bay Restricted Area.

Maerl beds - Maerl (*Phymatolithon calcareum)* is calcified seaweed densely covering the seabed with bright pink nodules which provide the structure of an ecosystem for other species. It is an OSPAR Threatened/Declining ecosystem. Maerl is protected within Ramsey Marine Nature Reserve.

Horse mussel reefs - The Isle of Man is thought to have some of the best examples of horse mussel (*Modiolus modiolus*) reefs in the British Isles. Horse mussel reefs are an OSPAR Threatened/Declining ecosystem. A significant horse mussel reef is protected within Ramsey Marine Nature Reserve.

Basking sharks - The Isle of Man is recognised as being globally important for basking shark (*Cetorhinus maximus*). The species occurs mainly around the south and west of the Island. Basking sharks appear to be displaying courtship behaviour in Manx waters and juvenile basking sharks are regularly seen, suggesting the Isle of Man is important in the reproduction of this globally endangered species. Basking sharks are protected under the Wildlife Act 1990 and voluntary codes of conduct.

Risso's dolphins - Risso's dolphins (*Grampus griseus),* are regularly found inshore around the coast of the Isle of Man, particularly around Langness and the Calf of Man. They are the second most frequently seen cetacean in Manx waters after harbour porpoises *(Phocoena phocoena).* They are mainly seen off the East coast of the Island, from Douglas Bay round to the Calf of Man. Risso's

dolphins *(Grampus griseus),* are listed on the Convention of Migratory Species and protected under the Wildlife Act 1990.

Harbour porpoise - Harbour porpoise are the most commonly seen cetacean in Manx waters and are seen all around the Manx coast. Harbour porpoise calves are often seen in Manx waters, suggesting importance for reproduction of the species. Harbour porpoises are listed under the Convention of Migratory Species and are an OSPAR Threatened/Declining Species. They are protected under the Wildlife Act 1990.

2. **Uplands**: Hen harrier *(Circus cyaneus),* curlew *(Numenius arquata),* least willow *(Salix herbacea),* lesser twayblade *(Listera cordata),* cranberry *(Vaccinium oxycoccus).*

3. **Lowland heath**: lesser bee fly, crimson and gold moth *(Pyrausta sanguinalis)*, short eared owl (*Asio flammeus),* field gentian *(Gentianella campestris).* The Ayres NNR is the best example of lowland/dune heath. It is notable for rare invertebrates.

Scarce Crimson & Gold moth (*Pyrausta sanguinalis):* Red Data Book 1 Endangered (taxa in danger of extinction in Great Britain and whose survival is unlikely if causal factors continue operating). A small moth inhabiting coastal sandhills, the larva feeding in a silken tube amongst the flowers of thyme. This is one of few sites for this species in British Isles.
Heath Beefly (*Bombylius minor):* Red Data Book 2 – Vulnerable. A small beefly found on heathland and sand dunes. Larvae are scavengers/predators in the nests of solitary bees such as *Colletes* species. Adults are usually found visiting flowers near suitable nesting ecosystem for the hosts. This is one of few sites for this species in British Isles.

4. **Lowland species-rich grassland**: Various species of orchids including greater butterfly (*Platanthera chlorantha*), early marsh (*Dactylorhiza incarnata*) and bee orchids (*Ophrys apifera*); waxcap fungi including The Ballerina (*Hygrocybe calyptriformis*); lesser mottled grasshopper (*Stenobothrus stigmaticus*) which is recorded nowhere else in the British Isles.

5. **Glens of deciduous woodland and scrub**: Bats (9 species of *Microchiroptera*), fungi including Lion Shield fungus (*Pluteus leoninus*),

6. **Wetlands** (including curragh and watercourses): European eels (*Anguilla anguilla*)

7. **Farmland and small villages**: Birds, including Skylark *(Alauda arvensis),* Yellowhammer *(Emberiza citronella),* Lapwing *(Vanellus vanellus),* Linnet *(Carduelis cannabina),* Tree sparrow *(Passer montanus);* English Elm trees (*Ulmus procera*), Pennyroyal (*Mentha pulegium*).

14.2.2 What are the pressures on key species? In other words: what are the threats (example unsustainable management of forest), their immediate causes (drivers of change like forest change or habitat change), their underlying causes (example overgrazing, fire, pollution), and the main driving forces (example: economic, political, social, external, etc.) and the area(s) concerned?

Table 17: Pressures on Key Species

Key species or groups of species	Threats, causes of decline, underlying causes and main driving forces
Whales and dolphins *(Cetacea spp)*	There are few direct impacts on these species in Manx waters. Disturbance by boat traffic and anthropogenic noise are probably the greatest threats. Cetaceans are at risk from entanglement in fishing gear and marine litter. Indirect impacts include pollution, particularly heavy metals and sewage.
Harbour porpoise (*Phocoena phocoena*)	Harbour porpoise are impacted most by vessel disturbance and anthropogenic noise. They are also vulnerable to pollution. Recent research has established annual/resident population size around the Island of 900-1000 which can now be monitored.
Basking sharks *(Cetorhinus maximus)*	This highly mobile species is mainly threatened by activities outside Manx waters, for example capture as bycatch in deep water trawls. Disturbance and collision risk from boat traffic is of most concern within Manx waters. Entanglement in pot lines is a risk but has not been reported recently in Manx waters. Codes of Conduct and an amendment to legislation have improved protection. As basking sharks are a wide-ranging species, they are also threatened by fishing and other impacts, particularly in offshore areas.
Bats *(Chiroptera spp)*	Loss of roost sites, due to development and improvement of buildings and the removal of damaged trees or branches. There may be a reduction in the availability of insect prey due to changing agricultural practices. On the positive side, increasing woodland cover provides extended foraging habitat.
Orchids *(Orchidaceae spp)*	Agricultural changes such as grassland improvement and wetland drainage, grassland abandonment of extensive grazing and invasion of scrub, development on un-improved land. Orchids may increase in number in transition areas.
Hen harriers (*Circus cyaneus*)	Population increased rapidly after colonisation, but has peaked and then halved, for unknown reasons. Sensitive to disturbance, though no specific population threats recognised locally.
Red billed chough *(Pyrrhocorax pyrrhocorax)*	This bird requires short grazed grass, especially in winter and enclosed spaces such as caves or buildings in which to nest. Agricultural changes and loss of undisturbed buildings could lead to decline. Population currently healthy.
Crimson and gold moth (*Pyrausta sanguinalis*)	Loss of host plant (thyme) and suitable ecosystem with nectar sources, although small bare sites are created to encourage this pioneer species to colonise these newly created sites.
Heath beefly (*Bombylius*	Lack of management of sites and subsequent scrub,

minor)	bracken (*Pteridium aquilinum*) or gorse (*Ulex europeaus*) invasion. Accidental fires and the churning effects of horses along bridleways and paths with subsequent loss of host nesting sites.
Eelgrass beds (*Zostera marina*)	There is some evidence of fishing impacts on eelgrass beds, with fish pots and their ropes directly damaging small areas. The impact is thought to be relatively small, and in other areas pot fishing appears to occur in eelgrass beds with minimal damage.
Maerl beds *(Phymatolithon calcareum)*	Mobile fishing gear is the main direct threat. Sedimentation and smothering can also be issues.
Horse mussel (*Modiolus modiolus)* reefs	There has been evidence of direct damage by mobile fishing gear to horse mussel reefs off the Point of Ayre, prior to their protection. In the longer term, horse mussels may be at risk from climate change as they are at the southern end of their range in Manx waters.

14.2.3 What kind of measures and indicators are currently used, or planned to be used to assess both species groups and the pressures on them? Who undertakes this work, or will do so in the future?

Table 18: Measures and Indicators for Species

Key species or groups of species	**Measures and indicators used or planned, who does this or who will do it**
Whales and dolphins *(Cetacea spp)*	Public sightings scheme and effort-based surveys run by Manx Whale and Dolphin Watch. Potential Biodiversity Indicator.
Bats *(Chiroptera spp)*	Manx Bat Group driven transects: Roadside mammal surveys. Potential Biodiversity Indicator.
Orchids *(Orchidaceae spp)*	Regular surveys of fields in management agreements under section 30 of Wildlife Act. Regular surveys of bee orchid sites by Wildflowers of Mann.
Rare Plants Register	The Wildflowers of Mann project maintains records of rare plants and reports on conservation action to conserve them.
Migratory birds	Records of migration, breeding and ringing activity are generated by the Calf of Man wardens at the Observatory. A continuous series of raw data and annual reports since the observatory opened in 1959 is maintained in the MNH library and archive. Data for particular surveys and censuses are sent to organisations such as the British Trust for Ornithology and Seabird Monitoring Partnership on a regular basis. Analysis in the annual reports allows broad trends to be detected, but detailed analysis of the data remains a research opportunity.
Breeding bird surveys	DEFA contracts annual breeding bird surveys, producing bird species trends, and a full island re-survey will be completed in 2016. The Manx Bird Atlas provides the baseline data. Potential Biodiversity Indicator.
Birds of Conservation Concern	An island-focused list of Birds of Conservation Concern is in production through joint work between DEFA and MBL (Manx Bird Life).

Hen harriers *(Circus cyaneus)*	DEFA breeding bird surveys (10% coverage/annum), 10-yearly targeted breeding surveys, winter roost counts.
Red billed chough *(Pyrrhocorax pyrrhocorax)*	Counts co-ordinated by Manx Chough Project, and DEFA breeding bird surveys.
Scarce crimson and gold moth *Pyrausta sanguinalis*	Conserved within Ayres NNR Regular surveys by DEFA's warden.
Heath beefly (*Bombylius minor*)	Conserved within Ayres NNR Regular surveys by DEFA's warden.
Butterfly surveys	Regular transects are undertaken on the Ayres and the Calf and annual reports of sightings have been produced by butterfly monitoring volunteers. Included as indicator of pressure on biodiversity.
Lizard surveys	Regular lizard records are collected by a volunteer, but not systematically. Monitored to flesh out distribution records in British Isles.
Eelgrass beds (*Zostera marina*)	Seasearch surveys and DEFA surveys in Marine Protected Areas. Potential Biodiversity Indicator.
Maerl beds *(Phymatolithon calcareum)*	Seasearch surveys and DEFA surveys in Marine Protected Areas. Potential Biodiversity Indicator.
Horse mussel reefs (*Modiolus modiolus)* reefs	Seasearch surveys and DEFA surveys in Marine Protected Areas. Potential Biodiversity Indicator.
Basking sharks *(Cetorhinus maximus)*	Public sightings scheme and effort based surveys run by Manx Basking Shark Watch. Potential Biodiversity Indicator.
Risso's dolphins *(Grampus griseus)*	Public sightings scheme and effort-based surveys run by Manx Whale and Dolphin Watch.
Harbour porpoise (*Phocoena phocoena*)	Public sightings scheme and effort-based surveys run by Manx Whale and Dolphin Watch.

Calf and Manx Ornithological Society (MOS) bird reports may both be relevant as monitoring tools. Annual reports are usually published on red grouse *(Lagopus lagopus scotica)* and chough *(Pyrrhocorax pyrrhocorax)*.

14.2.4 What actions are currently undertaken to reduce these pressures?

Development control

Biodiversity is recognised as a consideration in the terrestrial planning system as stated in the Isle of Man Strategic Plan, Towards a Sustainable Island. This addresses the pressures from development and terrestrial ecosystems and species. Specifically, Environment

Policy 4 states:

Development will not be permitted which would adversely affect:

(a) species and habitats of international importance:

(i) protected species of international importance or their habitats; or

(ii) proposed or designated Ramsar and Emerald Sites or other internationally important sites.

(b) species and habitats of national importance:

(i) protected species of national importance or their habitats;

(ii) proposed or designated National Nature Reserves, or Areas of Special Scientific Interest; or
(iii) Marine Nature Reserves; or
(iv) National Trust Land.

(c) species and habitats of local importance such as Wildlife Sites, local nature reserves, priority habitats or species identified in any Manx Biodiversity Action Plan which do not already benefit from statutory protection, Areas of Special Protection and Bird Sanctuaries and landscape features of importance to wild flora and fauna by reason of their continuous nature or function as a corridor between habitats.

Some areas to which this policy applies are identified as Areas of Ecological Importance or Interest on extant Local or Area Plans, but others, whose importance was not evident at the time of the adoption of the relevant Local or Area Plan, are not, particularly where that plan has been in place for many years. In these circumstances, the Department will seek site specific advice from the Department of Agriculture, Fisheries and Forestry (now Department of Environment, Food and Agriculture) *if development proposals are brought forward.*

In addition to this, Strategic Policy 2 states New Development will be located primarily within our existing towns and villages, or where appropriate in sustainable urban extensions of these towns and villages. Development will be permitted in the countryside only in exceptional circumstances.

Agricultural incentive schemes
Pressures from farming and ecosystem loss are addressed through the cross-compliance within the Countryside Care Scheme and the Statutory Management Requirements and Code of Practice to keep land in Good Agricultural and Environmental Condition. This scheme was renamed in 2015 as the Agricultural Development Scheme (ADS).

14.2.5 What actions do you intend to take to reduce these pressures?

A Biodiversity strategy for the Island is in preparation, and when complete and accepted by Government will help inform the biodiversity conservation aspects of the biosphere reserve, but there is already a substantial set of legislation, government programmes and non-government activities which ensure the biodiversity of the Island and its seas are well managed.

The following aims are topics to which the biosphere reserve would be responding, and may form component parts of a forthcoming Biodiversity Strategy:

- Developing the conditions of government support and incentive schemes under Objective 2 (government leading by example),
- Developing the biological recording centre under Objective 3 (Biodiversity knowledge),
- Raise awareness of conservation issues through education and public engagement under objectives 4 (Community engagement and understanding),
- Biodiversity Action plans for species and habitats through implementing actions under Objective 5 (habitats and species),
- Preparing invasive species strategies for land and sea under Objective 6 (Environmental risks),
- Biodiversity indicator measurements implemented under objective 7 (Sustainability).

14.3. At the level of genetic diversity:

14.3.1 Indicate species or varieties that are of importance (e.g. for conservation, medicine, food production, agro biodiversity, cultural practices etc.).

- Manx apple varieties (Andrew Johnson and Manx Codling) have been identified.
- "Bent" or marram grass *(Ammophila arenaria)* is used for traditional roofing (cultural practice). It is used for the ridge over a thatch of straw in the North of the Island.
- Honey bees are kept for their honey and wax. These bees are pollinators for vegetables and fruit trees as well as oilseed rape. A morphologically distinct Manx Black Bee (*Apis mellifera mellifera*) is being developed by breeding.
- British rare breeds of farm animals are an important genetic resource for animal breeding. This includes one of the largest flocks of registered Ouessant sheep in Europe.
- Manx Loaghtan sheep is a brown fleeced primitive breed, important for food and wool and known for its very distinctive horns.
- Rare animal species from other parts of the world are kept in the Curraghs Wildlife Park.
- Marine fish and crustacean species are important and fished commercially; lobsters *(Homarus gammarus),* crabs *(Cancer pagurus),* nephrops (also known as Dublin Bay prawns, Norway Lobster and Scampi) *(Nephrops norwegicus),* whelks *(Buccinum undatum),* queen ("queenies") *(Aequipecten opercularis)* and king scallops *(Pecten maximus).*

- Wild fish are caught by recreational anglers in the sea, rivers and reservoirs. These include cod (Gadhus morhau), whiting (Merlangius merlangus), poor cod (Trisopterus minutus), Pollock (known locally as Callig) (Pollachius pellachius), mackerel *(Scomber scombrus)*, and in rivers brown trout *(Salmo trutta),* sea trout *(Salmo trutta)* and salmon *(Salmo salar).* Rainbow trout (*Oncorhynchus mykiss)* are raised for fishing in reservoirs, and there is a wild stock enhancement scheme for salmon *(Salmo salar).*

14.3.2 What ecological, economic or social pressures or changes may threaten these species or varieties?

Table 19: Pressure and Threats on species

Species and varieties	Pressures and threats
Manx apple varieties	Value now recognised and new trees being propagated by one grower.
"Bent" or marram grass *(Ammophila arenaria)*	Only one craftsman, so cultural practice is at risk.
Honey bees	Disease and pests, although Manx bees are varroa mite free, as *Varroa destructor,* a widespread notifiable parasite of bees, which has decimated UK populations, has not reached the Island.
British rare breeds of farm animals	Disease is a threat to rare breeds of farm animals, especially when numbers are very small. Lack of market for carcasses which are non-standard can be a problem.
Manx Loaghtan sheep	Few threats now as there are more hobby sheep keepers and more commercial flocks. Loaghtan sheep now thrive in considerable numbers.
Marine fish and crustacean species	Risks from overfishing and marine developments.
Freshwater fish	Water quality is mainly good, but invasive plant species along some stretches of riverbank may contribute to reduced aerial food sources. Fish passage to some areas of good habitat hampered by weirs. Small-scale poaching of salmon and sea trout presents seasonal risk. Potential for marine developments to impact species which migrate between seawater and freshwater.

14.3.3 What indicators, at the level of the species, are used, or will be used, to assess the evolution of population status and associated use?

Table 20: Indicators

Species and varieties	Indicators
Manx apple	Numbers of plants propagated.
"Bent" or marram grass	Licences issued for taking "bent" from Ayres.

Honey bees	100% disease free status. All hives on the island have recently been inspected for signs of bee disease and the varroa parasite.
British rare breeds of farm animals	Population sizes of rare breeds are kept by the rare Breed Survival Trust.
Manx Loaghtan sheep	Size of flock.
Marine fish and crustacean species	Regular stock assessments.
Freshwater fish	Catch returns (catch per unit effort planned) Population density of trout and juvenile salmon at regular monitoring sites (>10 years data).

14.3.4 What measures will be used to conserve genetic diversity and practices associated with their conservation?

Animal health
Being an island introduces a natural level of added biosecurity to the Isle of Man. For example, there has been no record of Foot and Mouth in the last 60 years. The Island has implemented successful eradication campaigns for Enzootic Bovine Leukosis and Bovine Brucellosis, which have been recognised by the EU – the island is now officially free of these diseases. The EU has recently also recognised the Isle of Man as officially free from *Varroa* in the Bee population. A further application to the EU for official freedom from bovine tuberculosis is in process.

There is the potential for the island to become a high health area that protects nucleus populations of many breeds, and supplies disease-free individuals to other countries. Queen bees are supplied to research establishments in the UK because they are known to be free of *Varroa* and other bee pathogens.

Aquatic Animal Health is also of high status, being recognised in many EU Decisions and Regulations as free from many of the major pathogens, which enables significant worldwide export trade in rainbow trout eggs.

Honey bees
There is a healthy population of wild bees on the Island which mix with the hive bees. It is important to keep this population healthy too. Bee-keeping and good practice are promoted by the Isle Of Man Beekeeping Federation (three local branches) which is affiliated to British Beekeepers Association. Bee health is protected by legislation: Importation of Bees Act 1988, Bees Act 1989 and Bee Disease and Pest Control Order 2008.

Manx Ark project
The remote nature of the Island is utilised to contribute to the conservation of the rarest breeds of British farm animals through the Manx Ark project.

Manx Loaghtan Sheep Breeders Group's aims and objectives are:
to support Manx Loaghtan sheep breeders, and those who are interested in Manx Loaghtan sheep and promote Manx Loaghtan sheep generally, in close association with the Rare Breeds Survival Trust and the Manx Loaghtan Sheep Breed Society on the Isle of Man by:

- Demonstrating the full potential and versatility of Manx Loaghtan sheep including as a commercially viable sheep, as a producer of meat and wool and as a conservation grazer;
- Encouraging compliance with appropriate and satisfactory procedures for the registration of pedigree Manx Loaghtan stock in the United Kingdom, the Isle of Man, the Channel Islands and abroad;
- Defining Manx Loaghtan breed characteristics encouraging genetic diversity within those characteristics.

http://www.manxloaghtansheep.org/

The Curraghs Wildlife Park
The Wildlife Park has connections to the Durrell Wildlife Conservation Trust and keeps rare species such as the Livingstone's fruit bat and Bali sparrow. The Wildlife Park has links to breeding programmes with UK and European partners. It is a member of the British and Irish Association of Zoos and Aquaria (BIAZA) and the European Association of Zoos and Aquaria (EAZA). The Park has animals in European Endangered Species Programme, European Regional Studbooks and cooperates with studbook keepers. Isolation on an island is also beneficial in protecting these animals from disease outbreaks in the UK such as Foot and Mouth Disease.

Freshwater fisheries
Freshwater fish in rivers are conserved through:

- bag limits, minimum landing sizes, closed seasons and enforcement patrols.
- Fisheries Officers working closely with landowners, farmers, contractors and other Government Departments to promote good management practice, improve fish passage where possible, and minimise impact of engineering works and other development via mitigation and restrictions on timing.
- promotion of awareness of conservation issues via news releases, website and literature.
- Fisheries legislation limiting potentially damaging practices, e.g. legal requirement to seek consent prior to dredging watercourses.
- Carefully targeted stocking of young salmon fry (broodstock sourced from same river) to areas where accessibility for natural recruitment is limited.
- Annual surveys of salmonids to monitor populations and inform management decisions.

15. DEVELOPMENT FUNCTION:

15.1. Potential for fostering economic and human development which is socio-culturally and ecologically sustainable:

15.1.1 Describe how and why the area has potential to serve as a site of excellence/model region for promoting sustainable development.

Prior to the current period of unbroken economic growth, which commenced in the mid 1980s, GDP per capita was only 57% of that in the UK, and the majority of employment was in low value-added sectors experiencing decline at the time, such as tourism, agriculture and fishing. Many young people left the Island in search of work or training. Some were fortunate enough to attend university, but a lack of opportunities meant many would not return. Based on past records and using the economically active population from the 1976 Census, the highest unemployment reached between 1978 and 1981 is 4.6%. Since then, it has been fluctuating between 2 and 3%, a remarkably low figure.

Initially, benefitting from its self-governing nature, the Island was able to establish itself as a low tax jurisdiction and emerge as a centre for offshore finance. To reduce the inherent risk of basing the economy on a single emerging sector, the Isle of Man Government has more recently pursued a strategy of economic diversification coupled with power and telecoms infrastructure investment. As a result, the Island has experienced a remarkable broadening of employment sectors, as seen in Table 21 and Figure 17.

Industrial Sector	1951	1961	1971	1981	1991	1996	2001	2006	2011
Agriculture, forestry, fishing	2,542	1,911	1,433	1,412	1,240	938	543	642	850
Manufacturing	694	435	3,111	3,467	3,348	3,562	3,185	2,248	2,295
Construction	3,073	1,664	2,755	2,921	3,404	3,372	2,512	3,374	3,352
Gas, electricity and water	616	465	504	496	513	462	515	603	878
Transport and communication	2,180	1,875	2,122	2,624	2,437	2,693	3,331	3,809	3,037
Wholesale distribution		672	845	867	851	781	728	905	821
Retail distribution	3,315	2,411	2,696	2,687	2,993	2,911	3,644	3,645	3,683
Insurance, banking, finance and business services	357	370	760	1,515	4,353	5,941	8,959	9,395	9,444
Professional, educational, medical and scientific services	1,576	1,702	2,690	3,737	5,438	6,081	7,296	8,060	8,917
Tourist accommodation	-	-	1,451	987	856	765	743	362	679
Other catering and entertainment	4,605	4,344	678	996	1,403	1,156	2,116	1,897	2,129
Miscellaneous services	-	-	1,954	2,530	2,849	2,768	2,373	3,075	3,382
Public administration	1,870	1,250	1,134	1,625	2,144	2,147	3,105	2,898	3,058
Not stated or inadequately described		146							609
Total	**20,828**	**17,245**	**22,133**	**25,864**	**31,829**	**33,577**	**39,050**	**40,913**	**43,134**

Source: Cabinet Office

Table 21: Number of people employed in each sector, 1951-2011

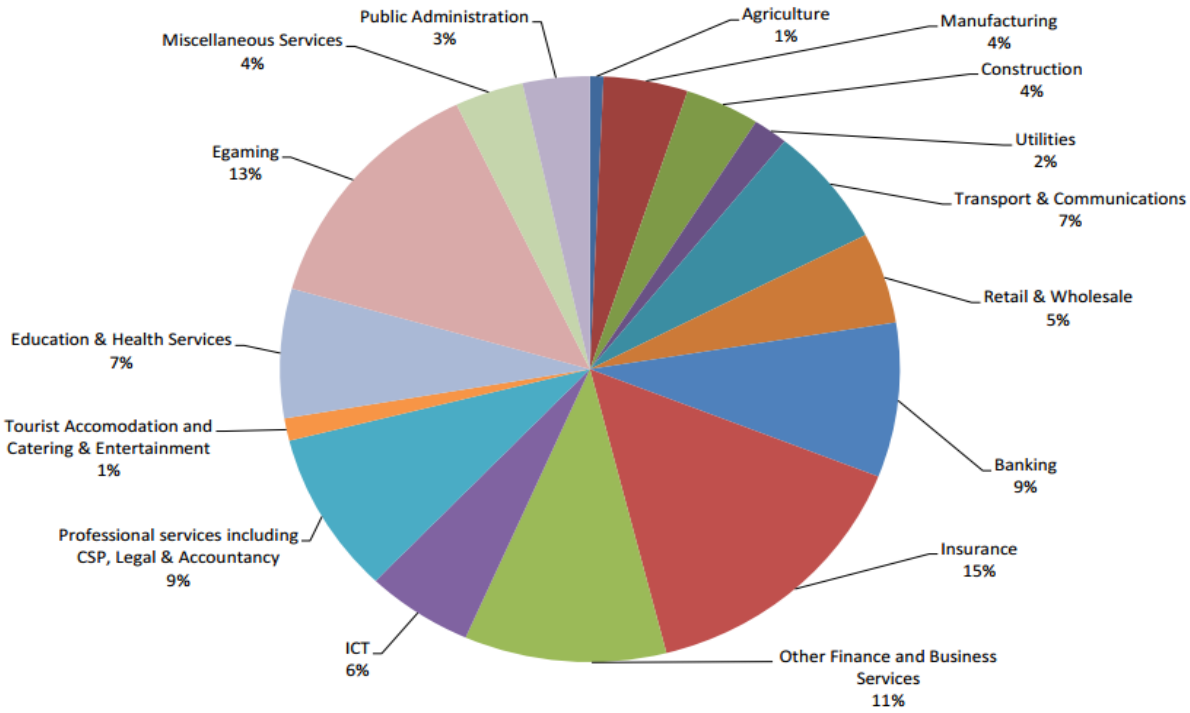


Figure 17: Composition of national income by sector 2012/2013 – Isle of Man National Income Accounts 2012/2013 (most recent data available)

This has enabled younger generations to remain on the Island, or return following higher education away from the Island, which has improved the demographic profile to the benefit of society as a whole and created a more resilient and sustainable economy. This resilience has proved itself in the wake of the global financial crisis, with continued growth in GDP despite the value of funds under management and total bank deposits in the Island decreasing since 2007 and 2008 respectively. This relationship is illustrated in Figure 18 below.

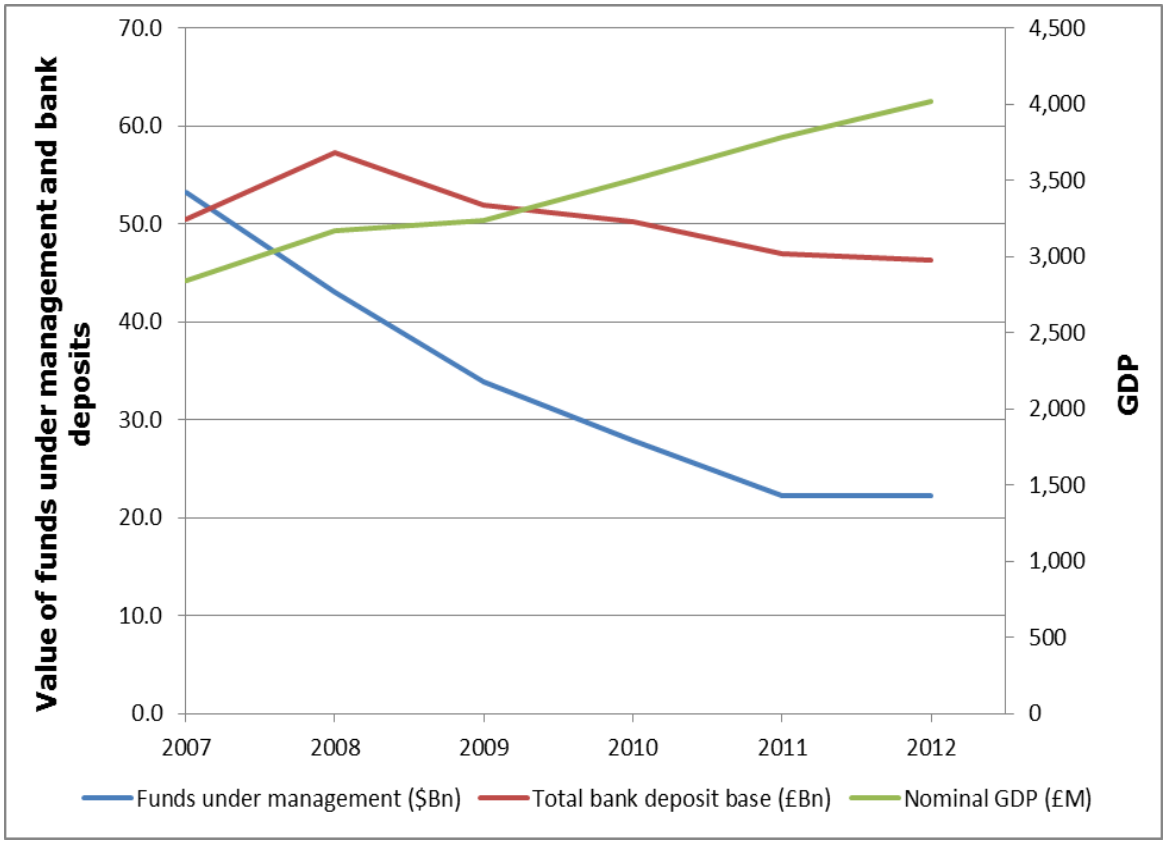


Figure 18: Relationship between nominal GDP and value of funds under management and total bank deposit base between 2007 and 2012
Please note these figures can only be collated two years in arrears, and 2013 figures are not yet available.

Economic prosperity has also enabled Government to build the institutional capacity required to deal with the environmental and socio-cultural challenges which have arisen from such growth.

Government is able to fund regulatory and advisory functions such as:

- Development control – steered by the all Island Strategic Plan which seeks to ensure sustainable land use
- Environmental Protection – Regulating discharges to controlled waters and waste disposal activities
- Fisheries - Regulation and sustainable management of sea and inland fisheries
- Work Permitting – the Island's only control on immigration
- Biodiversity – Regulation and advice relating to the protection of wildlife.

The Government has also been able to afford to maintain sites and attractions of importance to the culture and heritage of the Island, as described in detail in Section 10.6.

By pursuing a strategy of successful economic diversification and helping other small countries develop sustainable economies through the small countries financial management scheme (See Section 16.3.2), the Island acts as a site of

excellence for promoting sustainable development, supporting thus **Madrid Action Plan Target 8: Linkages with sustainable development initiatives** the Island acts as a site of excellence for promoting sustainable development.

Although the population and economic activity levels have grown significantly, there are challenges to improve the sustainability performance of the broader economy, although credible improvements have been made in some sectors explored in more detail in sections 15.2, 15.3, and 15.4.

15.1.2 How do you assess changes and successes (which objectives and by which indicator)?

A sustainable development strategy is in the early stages of production; however, a number of existing workstreams are likely to be included in the strategy.

On 21 May 2013, Tynwald voted unanimously in favour of the following Key Objectives which relate specifically to climate change mitigation and adaptation:

- *Government will adopt a greenhouse gas emissions target for the Isle of Man of 80% reduction of 1990 levels by 2050.*
- *Government will develop policies and strategies that will lead to reductions in greenhouse gas emissions to meet that target.*
- *Government will develop policies and strategies to ensure that it understands the risks of climate change to the Isle of Man and adapts to these risks.*

Other relevant policies and indicators are as follows:

- Waste Policy and Strategy 2012-2022 – Aim to recycle 70% of waste, send 25% to energy from waste, 5% to landfill (inert waste e.g. plasterboard and asbestos.)
- Food Strategy – To grow the value of the of the food industry on the Island from £75M to £125M by 2025.
- Sustainable Water Supply – A National Infrastructure Plan is under development which considers the future demands on the Island's infrastructure and including the per capita demand for potable water.
- Bathing Water Quality – Coastal Bathing water quality is monitored at 20 sites around the Island during the summer season and displayed on each bathing beach. Funding has been approved to increase the proportion of the population connected to waste water treatment facilities which should improve bathing water quality where it is low.
- Quality of Life – Government periodically carries out public opinion surveys.
- Sustainable Fisheries – The Island's Queen Scallop fishery is working to re-establish MSC certification.

Developing these indicators will be part of the Biosphere Reserve management plan process.

15.2. If tourism is a major activity:

15.2.1 Describe the type(s) of tourism and the touristic facilities available. Summarize the main touristic attractions in the proposed biosphere reserve and their location(s).

The Isle of Man offers a wide range of visitor attractions and activities as well as significant landscape beauty, quality accommodation and historic sites. Coast, nature, railways and culture have been the four main themes attracting visitors to the island (Figure 14)There are 77 visitor attractions in the Island including a number of heritage sites that are owned and run by Manx National Heritage (MNH) as well as private sites e.g. Milntown. A full list of these is available here: http://www.visitisleofman.com/guide/ebook.xml

Visitors may follow in the footsteps of the first Neolithic settlers and the ancient Celts, and discover the legacy of the Vikings, of whom evidence remains in the Manx landscape, culture and long-established government. Visitors can learn about the seafaring nation which gave rise to smugglers, mutineers and naval heroes, and the way of life of Manx Crofters and miners in past centuries.

The historical landmarks range from the world's largest working waterwheel, the Lady Isabella, to Castle Rushen, one of Europe's best-preserved medieval fortresses. The Steam Railway, Manx Electric Tram and Snaefell Mountain Railway are owned and operated by Isle of Man Government.

The island hosts the internationally renowned tourist trophy (TT) road races for motor bikes as well as the Manx Grand Prix and the Southern 100. These are now enjoying increased levels of interest and numbers of visitors, estimated to be up to 40,000 in the two weeks of the TT races. Perhaps the most iconic Isle of Man event, certainly for tourism, is the TT races, which commenced in 1907 over a 37.73 mile (60.72km) public road circuit. In their earliest years, this took advantage of the Manx legislature allowing racing on public roads. It was also a means to encourage the new technology, of newly invented internal combustion engine motorcycles. In their first years these 'new' motorcycles had a leather belt (rather than a metal chain), no gears, and pedals to help go up steep hills. The rate of progress was such that, shortly thereafter, rules were introduced that required gears, metal chains and no pedals, all of which helped spur innovation. The running of these races has always relied, and continues to rely, on a huge range of volunteer marshals. Over 500 are needed for each practice and race, which itself is a very credible community voluntary activity.

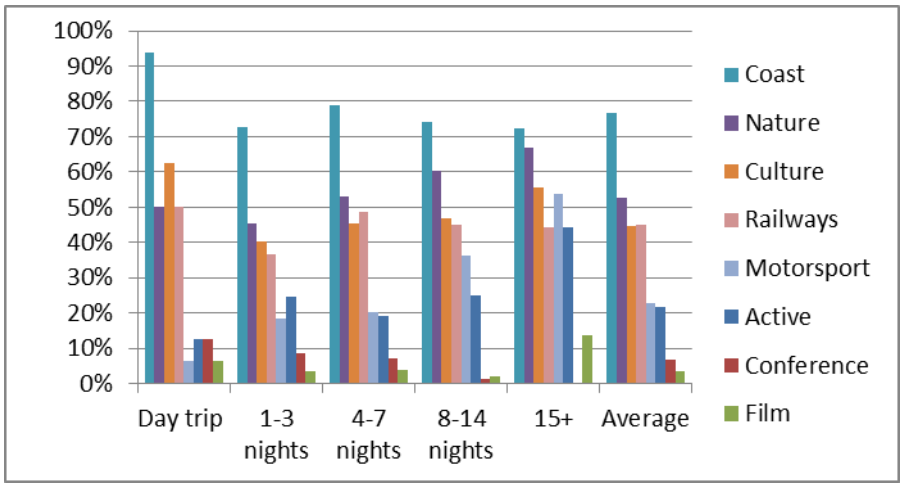
The most recent evolution of the TT races has been the introduction of an electric class of motorbikes in 2009. In its first year, entrants had a fastest lap time of 87mph (140kmh). By year five, in 2014, the lap time had increased to 117mph (188kmh), a rate of increase that took petrol motorbikes over 50 years. This innovation has had a sizeable off-island benefit in increasing the rate of innovation in this technology, with wider potential end uses for electric vehicles and

associated technologies. It is notable that several teams each year for this class are from universities such as Imperial College London, Brunel University, Kingston University, and from outside the UK, for example Ohio State University from the USA.

Active sports sports such as mountain-biking, paragliding, and triathlons are increasingly popular. In addition coasteering, kite boarding, surfing, yachting, dinghy sailing, kayaking, diving, open water swimming and many other sea–based activities add to the attraction of the island to younger people.

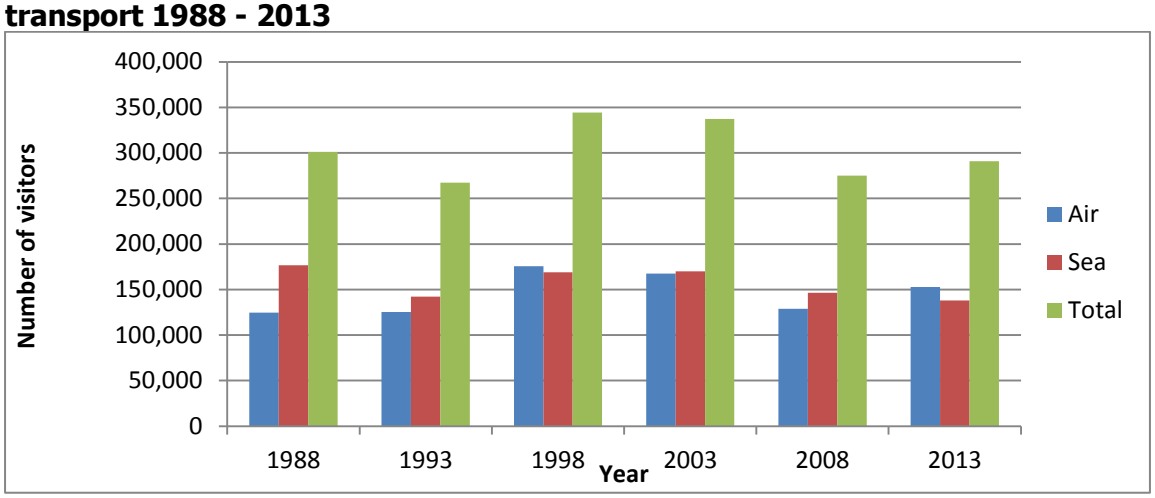
The island's significant natural beauty, very varied landscape, diverse coast and abundance of marine, coastal and upland wildlife are enjoyed by many. The enduring beauty of the landscape has inspired numerous artists, photographers and writers over the centuries.

Figure 19: Graph of features which attract visitors to the island in recent years



15.2.2 How many visitors come to the proposed biosphere reserve each year? (Distinguish between single-day visitors and overnight guests, visitors only visiting the proposed biosphere reserve or only passing on the way to another place). Is there an upward or downward trend, or a particular target?

Figure 20: Number of visitors to the Island every five years and mode of transport 1988 - 2013



Over the last 4 years, while numbers of day visitors have dropped, there has been an increase in the total number of Period Visitors in Paid Accommodation (regarded as traditional tourists), and this trend is expected to continue. These visitors make up the majority (38.5%), with those visiting friends and relatives the second highest (37%) and business visitors come third (22.8%) (2013). Visitors come predominantly from the UK, with only 7% of visitors coming from further afield. The average length of stay of visitors (excluding day visitors) was an estimated 5.1 nights in 2013.

Figure 7: Infographic of Tourism in the Isle of Man in 2013

Table 22 below shows the number of visitors to various locations. Many of these visitors are from within the island.

Table 22: Estimated visit numbers between 2010 -2012

Attraction	Estimated number of visits
Areas of Public Ramblage – mainly uplands (DEFA)	800,000
18 National Glens (DEFA)	140,400
20 Plantations (DEFA)	104,000
The Sound MNH	92,200
5 Parks, gardens and other open spaces	65,000
Curragh Wildlife Park (DEFA)	50,000
Langness (private land)	40,000
Cregneash Spanish head MNH	36,000
Niarbyl MNH	35,300
St Michael's isle MNH	25,500
Ayres DEFA and MNH	20,000
Maughold brooghs MNH	18,000
Ballaugh Curragh MNH	9,000
Manx Wildlife Trust reserves	17,130
Sulby Claddagh (camp site) DEFA	5,200
MWT Visitor centres	Approx. 3,000

15.2.3 How are tourism activities currently managed?

The destination management and marketing of the Isle of Man is operated by Isle of Man Tourism, a division with the Department of Economic Development of the Isle of Man Government. The custodian of the main historic sites and many open countryside areas is Manx National Heritage.

Heritage transport and public buses are mostly owned and operated by the Department of Infrastructure. Several other smaller attractions are operated or run by volunteers or by local Commissioners. There are over 460 tourist accommodation providers, 42 travel and tour operators, and 586 small businesses offering facilities to visitors, all of which are private companies.

15.2.4 Indicate possible positive and/or negative impacts of tourism at present or foreseen and how they will be assessed (linked to section 14 Conservation function)?

Tourism as a sector supports a range of employment and diversification opportunities and therefore contributes to the economy. Tourism does have the potential for negative social and environmental impacts. These include

competition for small rural properties, making housing for local first time buyers more expensive and scarce.
The Isle of Man Visitor Economy Strategy 2012-2015 is available using the following link. http://www.visitisleofman.com/trade/resourcelibrary/strategies.xmll

There is a potential for negative impacts from over-intensive use of unmade roads, locally known as Green Lanes, although there are also work plans involving public and private sector to improve this situation.

15.2.5 How will these impacts be managed, and by whom?

The Isle of Man Government is the main promotor/facilitator of the island's tourism sector and also seeks to manage its impact. The agency which has specific responsibility for tourism is Isle of Man Tourism, within the Department of Economic Development, through the Tourist Act 1975 and subsequent regulations and amendments. Officers within this team are also members of a variety of Steering Groups including the Green Lanes Action Group, Air and Sea Strategic Group, and Visitor Economy Strategic Group to name just a few.

DEFA worked with charter boat operators to implement the Wildlife SafE (WiSE) scheme, the UK standard for commercial marine wildlife watching, in the Isle of Man. There are currently nine accredited Isle of Man operators, see http://www.wisescheme.org/?page_id=238 . This is a very credible take up rate, in comparison to areas with much higher populations, e.g. Northern Ireland with a population of 1.8 million has 18 WiSE accredited operators, and Devon as an English county with population of 1.1 million has 6 WiSE accredited operators.

Department of Environment Food and Agriculture has responsibility for amenity and lands in Government-owned glens and uplands and actively encourages a wide variety of recreational activities on its land while also seeking to protect and enhance biodiversity.

An innovative approach by MWT to encourage wider interest in low-impact coastal tourism has been the roll out of static "binoculars" with interpretation panels at several location around the coast. This has assisted members of the public being more aware of the species visible from the coastline and which can be reported as sighting to local NGO's.

A Green Lane Management Strategy has been produced after extensive consultation with a number of organisations, including private sector groups, and other Government Departments. The proposed measures will be implemented to promote sustainable use of these unpaved highways and to address concerns raised about some of the Island's upland tracks. There is to be improved signage on the tracks, along with better quality maps showing preferred routes and highlighting the locations of vulnerable tracks. The Department of Infrastructure will continue to support the Green Lane User Group. It is intended that the group will, over time, become more heavily involved in managing the work being carried out by volunteers and also in monitoring the use of the tracks.

Continuing to implement sustainable tourism, based on these various principles and initiatives, will assist in delivering the objectives of the biosphere reserve.

15.3. Agricultural (including grazing) and other activities (including traditional and customary):

15.3.1 Describe the type of agricultural (including grazing) and other activities, area concerned and people involved (including men and women).

Agriculture is the primary land use in the Isle of Man, on about 80% of its 572 km² land area. There are approximately 400 active farmers, of whom 75% are male. The age profile of farmers is skewed towards middle-aged and over: two-thirds are over 46. Young Farmers Clubs are very active and encourage the younger generation to consider a career in agriculture.

The farming sector is dominated by family farms, whose average size is 100 ha. This is supported by organisations such as the Manx National Farmers Union, the Flockmasters, the Farming and Wildlife Advisory Group and the Lady Farmers Group.

Rearing livestock is the most common agricultural industry, as the Island's climate and topography is most suitable for growing grass. The major farming sectors by land area and stock numbers are beef and sheep production, with 7,500 cattle and 53,000 breeding ewes. Beef livestock numbers peaked at 10,112 in 2008 but ,as in other beef producing areas, numbers have steadily declined since then. Ewe numbers have also declined, with the national flock reducing by around 12,000 ewes over the same period.

The Manx Loaghtan sheep is unique and indigenous to the Island and recognised with a Protected Designation of Origin (PDO) status. They are famous for their four horns, mouse brown wool, and tasty slow-maturing meat.

Figure 22: Manx loaghtan sheep (left), Manx cheeses (right)

The Island is self-sufficient in milk production. There are 35 dairy farms, with a total of 4000 dairy cows; annual milk production is 25 million litres. The vast majority of this is processed on the Island by the farmer-owned Isle of Man Creamery. Three small independent dairy farms also supply cow and goat milk direct to consumers.

Manx farmers keep 300 breeding pigs, 12,000 hens, all of which are free range, and grow cereals on approximately 4500 ha on 12 arable farms. Most crops are grown for feeding livestock, but milling wheat goes to the Island's flour mill to make bread and milling oats are exported. Some arable seed crops (peas) red wheat, oilseed rape and linseed are grown, primarily for export to the UK. The recent decline in livestock numbers is helping generate changes in the industry but also placing a strain on the Island's three processors (abattoir, creamery and flour mill). These face the challenges of a small home market and having to compete without the advantage of economies of scale.

Farm diversification of high-value, artisanal production of milk, cheese, meat and other food products is also becoming increasingly common and is supported by the Food Matters Strategy http://www.whereyoucan.com/fooddrink which aims to help this sector, already worth £75m to the Isle of Man economy and supporting 1,300 jobs, to grow and be worth £125 million by 2025.

Today, Manx products may be found all over the world. For instance, 1,500 tonnes of cheese are exported per year, primarily to North American markets, 7,000 tonnes of queenies, king scallop, crab and lobster as well as 1,000 tonnes of beef and 600 tonnes of lamb.

Agriculture: Interest in food provenance is high, and can be captured in trends of local food sales and GDP contribution from the sector.

The **2008 Vision for Agriculture** which was the precursor to the introduction of the Countryside Care Scheme identified three main aims for the future of agriculture:

1. A reliable, sustainable and self-reliant industry capable of feeding the Manx nation with a diverse range of food products including our staple foods.
2. An efficient production system combined with a tailored market focus and a strong, clean Manx brand image so that reliable profits can be obtained from the marketplace.
3. Responsible custodians of our countryside, natural heritage

The introduction of the CCS addressed point 1 by removing the Government influence on production and allowing diversification and addressed point 3 by introducing cross-compliance.

Point 2 is currently being addressed through the production of a Food Business Development Strategy to ensure that the importance to local culture and the economy of local provenance and the creation of quality Manx food products is valued and recognised and a mechanism for its support established. This document will focus on food diversification, branding and marketing, efficiency and investment in technology amongst others topics. This will also contribute to the goal of increasing the Isle of Man's food security, a strategy for which was approved at June 2014 Tynwald.

15.3.2 Indicate the possible positive and/or negative impacts of these activities on biosphere reserve objectives (section 14 conservation function).

Farming over millennia is largely responsible for the landscape of small fields and upland moorland seen today. Continuing a sustainable level of food production will continue to maintain the countryside. A reduction in the viability of farming could result in the loss of the distinctive landscape and the ecosystems which rely on sensitive agricultural management, such as species-rich grassland and heathland.

Conversely, without adequate protection, unsustainable farming practices can damage ecosystems such as watercourses and landscape features such as hedges. The Agricultural Development Scheme (ADS), formerly known as The Countryside Care Scheme (CCS), through cross-compliance encourages farmers to retain hedges, ecosystems and other landscape features, whilst also conserving soils and ensuring compliance with farm waste management and pesticide regulations. It is an important measure in ensuring an overall positive contribution to the objectives of the biosphere reserve. The ADS is similar to UK Single Farm Payment Scheme to ensure that Manx farmers, whilst not in the EU, are able to compete fairly in the UK market.

15.3.3 Which indicators are, or will be used to assess the state and its trends?

Biodiversity indicators are being developed. These include direct measures of the biodiversity such as the breeding bird census. Since the publication of baseline bird data by 1 km squares by Manx Birdlife to update population figures and trends for the Manx Bird Atlas, collated between 1998-2003, one tenth of the island has been re-surveyed each year to produce trends.

Other indicators will be used to assess the state of biodiversity. The percentage of land in ADS and numbers of ADS breaches are indicators of the success for managing agricultural impacts on the biosphere reserve.

Numbers of incidents of agricultural contamination of water (silage effluent and slurry being the most common) will be used to identify point source pollution. Diffuse pollution is much more difficult to monitor and control.

15.3.4 What actions are currently undertaken, and which measures will be applied to strengthen positive impacts or reduce negative impacts on the biosphere reserve objectives?

Agriculture

CCS was introduced in 2009 and brought about a major change in the way farmers and other landowners were supported financially. Historically, this was through production support payments. The CCS (now ADS) allows for the transition to a flat rate/area payment with the aim that people can diversify and respond to the marketplace.

Farmers applying for a payment from the ADS need to comply with two sets of Standards in order to qualify for their payment. There are 14 Statutory Management Requirements

(SMRs) plus 18 Standards of Good Agricultural and Environmental Condition (GAECs). The former largely relate to existing legislation, with which all farmers should be complying already, and the latter define good management and best practice which many farmers will be following.

Payment under this Scheme is dependent upon meeting cross-compliance standards (as defined in Chapter 6 of the Isle of Man Department of Environment, Food and Agriculture Farmers Handbook). Farms are inspected to ensure that applicants to the Scheme are meeting cross compliance standards. There is an annual cycle of cross-compliance inspections. From 2009-2013, all farms were inspected at least once (Table): see https://www.gov.im/categories/business-and-industries/agriculture/countryside-care-scheme/ . Some received additional inspections, due to reports of breaches (termed 'standalone' inspections). Penalties are applied where this is found not to be the case; these are deducted from the second or final instalment of a Scheme payment. Farmers can appeal against the imposition of penalties.

During a cross-compliance inspection, the field officer from DEFA:

- checks the whole farm including fields and boundaries (land eligibility / breaches);
- checks livestock records, pesticide use records and medicine records;
- makes visual checks including animal welfare, pollution, hedge-trimming/removal, livestock identification breaches, storage of illegal medicines, litter and weeds.

Since scheme year 2014 onwards, the aim is to inspect all new applicants plus some re-inspections based on risk. The number of holdings to be inspected each year depends in part on how well the rules for ADS are being followed across the Island. Good practice will result in fewer inspections.

		2013		2012		2011		2010		2009	
Number of XC Inspections (inc. standalones)		69		83		82		77		51	
		WL	Penalty	WL	Penalty	WL	Penalty	WL	Penalty	WL	Penalty
SMR 1	Wild Birds	0	0	0	0	0	0	0	0	0	0
SMR 2	Flora & Fauna	0	0	0	0	0	0	0	0	0	0
SMR 3	Groundwater	0	0	0	2 x 3%	0	0	0	0	0	0
SMR 4	Sewage Sludge	0	0	0	0	0	0	0	0	0	0
SMR 5	Nitrate Vulnerable Zones	0	0	0	0	0	0	0	0	0	0
SMR 6	ID & Registration of Animals (XC insp)	6	1 x 3%	2	1 x 3%	13	1 x 1% 1 x 3%	5	2 x 0.5% 5 x 0.75%	0	0
	CII only	9	1 x 1% 1 x 3%	3	0	0	0	7	3 x 0.75%	0	5 x 0.5% 2 x 2.5%
SMR 7	Plant Protection Products	1	0	0	1 x 3%	1	1 x 1.5% 1 x 3%	2	0	0	0
SMR 8	Restricted Drugs	0	0	0	0	0	0	0	0	0	0
SMR 9	Food & Feed	0	1 x 5%	0	0	0	0	0	0	0	0
SMR 10	TSE Transmissible Spongiform Encephalopathy	0	0	0	0	0	0	0	0	0	0
SMR 11	FMD Foot and Mouth Disease	0	0	0	0	0	0	0	0	0	0
SMR 12	Control of Animal Disease	0	0	0	0	0	0	0	0	0	0
SMR 13	BTV Blue Tongue Virus	0	0	0	0	0	0	0	0	0	0
SMR 14	Welfare of Farmed Animals	0	0	0	0	0	0	0	0	0	0

		2013		2012		2011		2010		2009	
		WL	Penalty	WL	Penalty	WL	Penalty	WL	Penalty	WL	Penalty
GAEC 1	Soil Erosion	0	0	0	0	0	0	0	0	0	0
GAEC 2	Wind Erosion	0	0	0	0	0	0	0	0	0	0
GAEC 3	Soil Capping	0	0	0	0	0	0	0	0	0	0
GAEC 4	Waterlogged Soils	0	0	0	0	0	0	0	0	0	0
GAEC 5	Burning of Crop Residues	0	0	0	0	0	0	0	0	0	0
GAEC 6	Heath Burning Code	0	0	0	0	0	0	0	0	0	0
GAEC 7	Erosion caused by Livestock	0	0	0	0	0	0	0	0	0	0
GAEC 8	Arable Crop Rotation Standards	0	0	0	0	0	0	0	0	0	0
GAEC 9	Arable Stubble Management	0	0	0	0	0	0	0	0	0	0
GAEC 10	Undergrazing	0	0	0	0	0	0	0	0	0	0
GAEC 11	Overgrazing	0	0	0	0	0	0	0	0	0	0
GAEC 12	Supplementary Feeding	0	0	0	0	2	0	0	0	0	0
GAEC 13	Landscape litter, waste & scrap	4	3 x 1% 1 x 3%	3	6 x 1% 2 x 3%	10	1 x 0.5% 9 x 1% 1 x 1.5% 2 x 3% 1 x 5%	21	11 x 0.75% 3 x 3.75%	15	4 x 0.5% 2 x 2.5%
GAEC 14	Protection of Habitats etc		1 x 1%	0	2 x 5%	0	0	0	0	0	1 x 0.5%
GAEC 15	Application of Lime, Fertilisers etc	1	0	0	0	0	0	0	0	0	0
GAEC 16	Field Boundaries	0	1 x 50%	0	1 x 3%	0	1 x 5% 1 x 50%	0	2 x 0.75% 2 x 3.75%	0	1 x 0.5%
GAEC 17	Encroachment of Unwanted Vegetation	0	0	0	0	0	1 x 0.5% 1 x 1%	1	1 x 0.75%	1	0
GAEC 18	Public Rights of Way	0	0	0	0	0	0	0	0	0	0

Land Eligibility		8		8		11		11		6	

Key:

SMR	Statutory Management Requirements	WL	Warning Letter
GAEC	Standards of Good Agricultural and Environment Condition	CII	Cattle Identification Inspection

Table 23: CCS cross-compliance inspection report for 2009-2013.

Alongside the ADS and other Codes of Practice, there is now also a voluntary Biosphere Isle of Man Code of Practice for landowners, which has been supported by the Manx National Farmers Union, who saw merit where similar Codes had been used in other biosphere reserves, particularly where they have helped boost local produce and tourism, see attached in *Appendix 4*.

An Uplands Strategy has been formulated to ensure sustainable management of the uplands. This work focussed on the roles active management currently plays in shaping the uplands and taking an 'ecosystem approach' to identifying the benefits and deliverables provided by active management, including ecosystems for native fauna, grouse shooting, and sheep production.

Marine pollution

In terms of managing pollution risks in the Territorial Waters of the Isle of Man, bought from the UK in 1991, amounting to approximately 4000 km^2 of additional territory, the Isle of Man took responsibility for overseeing salvage and pollution counter-measures in order to comply with international conventions. This responsibility is vested in the Ports Division of the Department of Infrastructure. The resulting contingency plan and stock of counter-pollution equipment have been continually revised and upgraded, to ensure that a high level of response is possible. The plan and equipment have been used successfully during small-scale incidents on the coastline, in harbours and inland. In the event of a large-scale incident, the Isle of Man has an agreement with the UK's Maritime and Coastguard Agency for the provision of assistance.

There is also a locally developed voluntary "Coastal Code". The Coastal Code is a resource designed to provide guidelines for good practice around the Isle of Man Coastal Areas: see https://www.gov.im/categories/home-and-neighbourhood/emergency-services/coastguard/isle-of-man-coastal-code/

15.4 Other types of activities positively or negatively contributing to local sustainable development, including impact/influence of the biosphere reserve outside its boundaries.

15.4.1 Describe the type of activities, area concerned and people involved (including men and women).

Given that the Isle of Man is reliant on importing a high proportion of its energy and other materials from outside the Island, it should also reduce its adverse impacts outside the Isle of Man where this is possible. Perhaps the largest example of this would be trying to reduce the Island's carbon dioxide emissions and therefore its contribution to climate change.

Energy Production (including renewables):
The Isle of Man is 98% reliant on imported primary energy, for electricity generation, heating fuels and transport fuels. There has been significant investment in power generation, with a shift from heavy fuel oil to diesel, and most recently to gas-fired combined cycle generation turbines. There are smaller contributions from an Energy from Waste plant (linked to Waste Management policies) and a small hydro-electric generation (linked to a previous water supply reservoir: see Section 15.1).

Investigations into marine renewables have already commenced. There is also scope for an expansion of wood-fuelled biomass for heating, using existing conifer plantations, which shows promise, but on a comparatively small scale.

Considerable investment has gone into improving energy efficiency in buildings, across the public sector and in businesses. The 'Cosy Homes' project has provided full insulation, wherever possible, to public sector housing (over 6,000 housing units) and some 5,000 homes and vulnerable households in private sector accommodation. In 2008, Tynwald established an 'Energy Initiatives' fund which has invested in improvements, making financial and energy savings in government departments and state-run buildings. This fund has also financed broader sustainability projects such as:

- The Energy Doctor service provided by Age Isle of Man, and its successor the Home Energy Check: web-based assessment tools for householders developed in conjunction with the UK Energy Saving Trust ;
- 'Passiv Haus' trial to assess whether this building type could be suitable for future public sector housing;
- Electric Vehicle charging points at several locations across the Island.

Waste Management and recycling
The Island's waste management is based on the principles of proximity, self-sufficiency, cost and the application of the waste hierarchy. Self-sufficiency means

that each area should provide facilities with sufficient capacity to manage its own waste whenever possible. An appropriate level of waste infrastructure is needed to manage the Island's waste. This is a requirement under the Basel Convention and Transfrontier Shipment (TFS) of Waste Regulations. Hazardous waste and recyclable materials for reprocessing are mainly shipped to the UK for recycling or for disposal where the UK agrees that it is not viable for the Island to process them. 'Waste Strategy 2012-2022: towards Zero Waste' provides long-term policies to manage all wastes. This strategy aims to recycle 70%, send 25% to the Energy from Waste facility, and 5% to landfill for inert wastes (for example plasterboard and asbestos).

Potable water supply and sewage treatment

Recently there has been considerable investment in improving drinking water supply and quality. The water supply is entirely sourced from upland runoff (including peat bogs). The original sewage master plan involved pumping all of the island's sewage to the Sewage Treatment Works in Santon, which now treats sewage from 67% of the Island's population. However, following a review, Tynwald backed the development of a regional treatment strategy in 2007, with smaller sewage works treating sewage for those areas currently not connected to the Santon works. The implementation of this strategy is ongoing. Prior to this, all sewage was discharged untreated to coastal waters. Although energy use to make these changes is considerable, these are necessary investments to protect human health and improve conditions in the natural environment.

Built environment

Land use planning and the built environment are managed through the Isle of Man Strategic Plan 2007, which is subtitled Towards a Sustainable Island. This policy document sets a framework to manage the future development of the Isle of Man, ensuring that proposals for development are located and designed in the most sustainable manner. The Strategic Plan has environmental objectives including

- To support the precautionary principle, which assumes that activity might be damaging unless it can be proved otherwise in respect of development where significant environmental implications are involved.
- To protect, maintain and enhance the built and rural environment (including biodiversity).
- To protect the individual character and identity of settlements, and to identify and protect those green spaces in built areas which contribute positively to public amenity.
- To minimize environmental pollution to air, water and land.
- To protect agricultural land such as to encourage self-sufficiency in food production.
- To protect the countryside and coastal areas for their own sake.

Strategic Policy 2 states that development will be permitted in the countryside only in exceptional circumstances.

DEFA headquarters in St John's is an example of a "green building". Thie Slieau Whallian was awarded the highest rating of excellence possible under BREEAM

(Building Research Establishment Environmental Assessment Method), in terms of its sustainable design and environmental performance. The building is the first, and presently the only, building in the Isle of Man to achieve such a rating, and is one of only 400 in the UK.

Transport
Domestic and business travel is dominated by road transport, and travel to the island is by plane or ferry. Local transport is dominated by private car use, although encouragement for more efficient vehicles includes road vehicle licencing rates based on emission classes rather than engine capacity. Public transport has been improved and uptake has increased. There are also heritage railways (electric and steam railways), which are a strong tourism attraction and used by some local people.

Fishing
As of 2012, 69 registered commercial sea-fishing vessels in the Isle of Man were licensed to operate in Manx territorial waters, in addition to vessels from neighbouring jurisdictions. The main catches are queenies, king scallops, crab and lobster, nephrops, whelk and smaller amounts of many other species. The economic value of this fish is in excess of £7m per annum, (see Section 15.3). Fishing and fish processing provide many jobs; the total value of the fishing industry is thought to be more than £12m per annum. Manx sea fisheries are developing a reputation for innovative sustainable management, with industry working in partnership with the government. A wide range of sustainable fisheries management measures are already in place in Manx waters, outlined in other sections.

Recreational sea fishing operates from the coast and private leisure craft, and many people are involved in this hobby. Freshwater fishing occurs on several rivers and lakes or reservoirs, and is licenced and regulated by Department of Environment, Food and Agriculture.

Local food production
Interest and attendance at local food fairs has been increasing, for example the Queenie Festival, and the Isle of Man Food and Drink Festival. An unusual situation is the Manx Beer Purity Law from the 19th Century, which limited the range of ingredients in beer brewed on the island (which remains to this day) to water, malt, sugar and hops. This is not dissimilar to German beer purity laws, and has helped Manx beers compete with other beers.

There has also been a resurgence of interest in vegetable growing, particularly allotments and keeping hens. If 50 people petition their local authority, it is obliged to offer allotment plots, or evidence why they cannot. This has led to several new allotment sites and renewed levels of interest.

Outdoor recreation; community involvement
Recent ecosystem services studies have confirmed that residents and visitors make extensive use of uplands and coastal areas over 800,000 times per year (for a resident population of 85,000).

Some information on the employment of men and women can be found in the statistical digest in Section 15.1.1.

15.4.2 Indicate the possible positive and/or negative impacts of these activities on biosphere reserve objectives (section 14 Conservation Function). Have some results already been achieved?

Energy Production: The investment in gas-fired combined cycle turbines has improved the CO_2 conversion factor, which has dropped from 0.7kg CO_2/kWh to the current level of 0.43kg CO_2/kWh. This is lower than that of the UK and several countries in Europe including Germany. A recent Tynwald decision has been to set a target to reduce CO_2 emissions from the Island by 80% (from 1990 levels) by 2050. This helps meet the global climate change agenda.

Development of marine renewables has potential for negative effects on the marine environment, which will be evaluated through Environmental Impact Assessments and avoidance, mitigation or compensation measures put in place.

Biomass production can be beneficial for biodiversity if the cut blocks are not too large and not sited on areas of vulnerable ecosystems.

Waste Management and Recycling: Following the closure of landfill sites for household and commercial waste, emissions of methane, a potent greenhouse has reduced by over 60,000 tonnes per annum (measured in tonnes of CO_2 equivalent); the energy from waste facility has the capacity to provide up to 10% of the island's electricity requirements.

Water supply and waste water treatment: Areas where sewage is piped away for treatment have shown improvements in bathing water quality. There should also have been changes and benefits for marine ecosystems as a result.

Built environment: The future development of the Isle of Man is guided by the Island Development Plan. This consists of both an all Island Strategic Plan and more local Area Plans. The overarching strategic aim of the current Island Strategic Plan (approved in 2007) is to "plan for the efficient and effective provision of services and infrastructure to direct and control development and the use of land to meet the community's needs, having particular regard to the principles of sustainability whilst at the same time preserving, protecting, and improving the quality of the environment, having particular regard to our uniquely Manx natural, wildlife, cultural and built heritage". All the policies within the Strategic Plan and all the allocations of land for development within the Area Plans are prepared to meet with this overarching aim.

Transport: Road transport, measurement of volume of road fuel sold can be captured. Recent figures suggest sales of c. 50,000,000 litres of petrol and diesel per annum. There has also been a notable reduction in emissions rating of new vehicles, supported by changes to Vehicle Excise Duty (VED) to encourage less polluting vehicles. A recent project to encourage sharing journeys through Liftshare.com had limited success.

Fishing: Manx Fish Producers Organisation and DEFA have worked together to introduce more sustainable fishing methods: for example, the majority of Queenies are caught by trawling rather than being dredge caught. For the Queenie Fishery to achieve MSC accreditation in 2012 it had to fulfil the MSC's three principles of sustainable fisheries management; sustainable fish stocks, minimising environmental impact and effective management.

The network of Marine Protected Areas has been established in collaboration with the fishing industry and protects nursery areas from mobile fishing gear and provides replenishment zones for the important fisheries. Initiatives such as the Baie ny Carrickey Closed Area and Ramsey Marine Nature Reserve Fisheries Management Zone have given fishermen a more active role in managing fisheries at a local level.

Regular fisheries and environmental surveys in Manx waters mean that fisheries and conservation initiatives are based on good scientific information. Investment of time and resources in liaising with the fishing industry and engaging other stakeholders and community members in decision making has led to well-supported initiatives that may otherwise have been controversial.

Outdoor recreation: Large numbers of people and/or motorised access can cause adverse impacts on certain areas. This is being addressed through stakeholder groups working together to improve management methods and improve access conditions, for example the Green Lane Users Group. Similar groups are active creating marked trails in plantations.

Wardens and rangers on uplands monitor condition of tracks and the recent initiative to improve green way condition by way of stakeholder volunteer's work parties. The number of marked off road trails in plantation has increased, popularity and usage remains high.

15.4.3 What indicators are, or will be used to assess the state and its trends?

Energy Generation and energy use is captured in emissions reporting to the UK by virtue of the UK extending coverage of the Kyoto Protocol to include the Isle of Man. The current metric used is CO_2 conversion factor for mains electricity, and tonnes of CO_2 per capita can also be assessed.

Waste Management and Recycling: Current overall recycling rate is 50%, with a target by 2022 to be at 70%.

Water supply and waste water treatment: Measured by % of population connected to waste water treatment facilities.

Built environment: Housing stock is old and rate of renewal is low. A possible Performance Indicator is average SAP (energy rating) of housing, which is assessed very 5 years, a higher SAP rating indicates a higher level of energy efficiency and lower energy usage. SAP average domestic property energy rating, change from previous survey. The most recent survey in 2007 showed average SAP rating of 53 compared to UK average of 47 at that time.

Transport: Road transport, measurement of volume of road fuel sold can be captured.

Fishing: Scallop and queen scallop fisheries are regularly monitored, with an annual survey and additional site surveys, for example in Ramsey Marine Nature Reserve. Stock management aims to maintain or improve stocks of commercially important species. DEFA are currently consulting on Fisheries Strategy that will ultimately set more specific goals for government and fishermen to achieve together. From a conservation perspective, it is possible to monitor the footprint of fisheries. A declining area of the territorial sea impacted by fisheries indicates larger areas of the marine ecosystem in a more natural state.

Agriculture: GDP of agriculture, as the aim is to increase this proportion and increase added value from produce.

Outdoor recreation: measure of outdoor visits per annum stable or increasing, number of way marked trails for mountain bikes in uplands and plantations, and further ecosystem services analysis following on from the work of Brander and McEvoy (unpublished internal report).

15.4.4 What actions are currently undertaken, and which measures will be applied to strengthen positive impacts or reducing negative ones on the biosphere reserve objectives?

Energy Generation and energy: Renewable power generation and many other sectors of the Isle of Man economy will change leading to 2050, strengthening the effects on the Biosphere Reserve and globally.

Waste Management and Recycling: Ceasing disposal of organic, household and commercial waste to open landfill continues to keep overall CO2 emissions levels lower than they would be without this waste management option. Further increasing recycling rates will reduce emissions further, again helping the Management of the Biosphere Reserve.

Water supply and waste water treatment: sewage treatment remains an outstanding issue that currently being addressed. This is currently a problem in some parts of the Reserve, but roll-out of modern treatment will reduce impact, especially in a few marine localities where it remains an issue of concern.

Transport: Efforts to migrate VED to be based on emissions and not just engine capacity are starting to bear fruit. Longer term aim will be to increase uptake of electric vehicles, which commenced by providing charging points in several town centres and introducing a night time EV charging tariff.

Fishing: A wide range of fisheries technical measures aim to decrease the impact of fisheries and increase their sustainability. These are outlined elsewhere in the document and include larger Minimum Landings Sizes for many species than are required in neighbouring jurisdictions, permanent and temporary Closed Areas to protect spawning and nursery areas and act as replenishment areas, Manx quotas for non-quota species and many other measures.

Agriculture: The key aim is to increase GDP proportion from agriculture and increase added value from produce, in turn ameliorating impacts on the rest of the Reserve.

15.5 Benefits of economic activities to local people

15.5.1 For the activities described above, what income or benefits do local communities (including men and women) derive directly from the site proposed as a biosphere reserve and how?

The total economic value of the Isle of Man economy is constantly measured. The total Gross Domestic Product of the Island and its economy is £3.8 billion. The active, modern, diverse economy represents a huge change in recent times. Prior to the 1980s, the economy was in decline and young people would need to move away from the Island to find work, a situation now reversed as the economy grew, and diversified.

Compared with global trends, the Isle of Man's economy has performed very credibly over the last 30 years and has enjoyed unbroken growth. This has only been achieved by moving into emerging sectors and consciously diversifying the economy.

Tourism contributed over £100m to the local economy, with >290,000 visitors in 2013: the most recent data. This equates to 900 jobs in the tourism accommodation sector and over 2,000 jobs in the catering and entertainment sectors: in aggregate, over 3,000 jobs (7% of all jobs on the Island), which is of great inherent value to residents.

As mentioned earlier, the Isle of Man has made a conscious decision to maintain a viable agricultural and fishing processing capacity. The Island has one abattoir, one creamery, and one flour mill. All milling wheat grown on the Island goes to the Mill, which produces a range of flours sold on and off Island. The Creamery (co-operatively owned by dairy farmers) processes most liquid milk, producing butter, cheese and cream. Liquid milk is supplied by the Creamery and one licenced producer who sells direct to customers. Most livestock are killed at the abattoir (co-operatively owned by livestock farmers), though there are some live exports for slaughter or breeding. This ensures that, as far as possible, processing ability remains on the Island, so that it retains its ability to be self-sufficient in basic staples.

The local agricultural and fisheries industries contribute over £70m and 1200 jobs to the economy. In future, it is essential to ensure that the local food sector can thrive as an innovative, competitive and resilient sector, as a sustainable source of growth and jobs.

15.5.2 What indicators are used to measure such income or other benefits?

The Isle of Man government is able to collect a great deal of figures, largely through its Economic Affairs Division of the CABINET Office, as well as figures collated by the Treasury. These figures are issued annually in various Treasury and Budget publications, most notably the Isle of Man Annual Digest of Economic and Social Statistics, and other GDP data sources.
Marine data collation is developed by DEFA, DoI (by virtue of being owner of seabed). In addition to this academic research and data gathering is carried out on the Isle of Man's behalf by Bangor University on marine issues.

15.6 Spiritual and cultural values and customary practices

(Provide an overview of values and practices, including cultural diversity).

The Isle of Man's spiritual and cultural values and customary practices are a unique mixture of influences from the surrounding isles and are a result of its distinct history. The Island's physical location in the middle of the Irish Sea is reflected in it being culturally diverse, in terms of both its material and its non-material culture, a mixture of predominantly Irish, Scottish and northern English influences together with older Norse influences. Historically, the Island developed from being a Celtic/Iron Age society to being part of the Norse Kingdom before coming under the influence of the Scottish and then English Crown from the later medieval period onwards. As a result, there were no Roman/Anglo-Saxon or Norman influences on Manx culture, contrasting with other parts of the British Isles.

Although similarities can be found in terms of the Island's Manx Gaelic language, traditional music and dance, vernacular architecture and folklore with neighbouring Ireland, Scotland and northern England, it is the subtle blend of these various influences rather than a direct copy of any specific cultural value or practice that makes them Manx.

15.6.1 Describe any cultural and spiritual values and customary practices including languages, rituals, and traditional livelihoods. Are any of these endangered or declining?

The Isle of Man has its own language, Manx Gaelic, together with its own tradition of Manx music and dance. Manx folklore contains a wide variety of calendar customs, rites of passage and traditional folktales and beliefs. Some are variations of those found in other 'Celtic' countries, some are more universal in Britain and Europe, whilst others are unique to the Island.

Although not currently endangered or declining, there have been periods of concern that the Island's values and practices (e.g. Manx language) were in a state of terminal decline and were about to disappear. As a result, by the end of the 19th century, individuals were working alone or forming societies or organisations to record and safeguard various aspects of Manx culture. This period of 'Celtic Revival' (accompanying an emergence of new 'Celtic Nations') also occurred elsewhere in the British Isles. On the Isle of Man, it resulted in the formation of Yn Cheshaght Ghailckagh (The Manx Gaelic Society) in 1899, the publication of textbooks on how to learn Manx Gaelic, and the starting of Manx language classes. Although the decline in numbers of native Manx speakers

continued through the 20th century until the death of the last native Manx speaker in 1974, a second 'Celtic Revival' from the 1960s-1970s onwards has seen a major revival in the Manx language.

A similar period of revival, recording and promotion, followed by a period of apparent decline, was seen in Manx music and dance through the 20th century. But at no point did the Manx language, traditional music and dance or folklore traditions such as Hop tu naa (Manx 'Halloween') totally disappear. So the revival in terms of a growth in numbers and participation has not been about rediscovering or resurrecting a lost practice but about the proactive promotion and reinvigoration of an existing tradition.

Tynwald Day is perhaps one of the most significant examples of a surviving customary practise, bound with ritual and ceremony with its origins in the Norse period of Manx history. As well as the formal legal business of Tynwald Day, held annually on 5th July, a fair and market are key elements of this national day. In recent years, the Tynwald Settings Enhancements Sub-Committee has introduced several other forms of celebration and since 2000, the week of Tynwald Day has been commemorated as 'Manx National Week'. This week has gained increasing significance in the Island's school timetable and has encouraged schools to plan Manx culture into the curriculum.

15.6.2 Indicate activities aimed at identifying, safeguarding, promoting and/or revitalising such values and practices.

The Manx Museum (now operating under the trading name of Manx National Heritage) www.manxnationalheritage.im was established by Act of Tynwald in 1886, initially for the preservation of the Island's monuments and the formation of a collection of objects representing Manx culture and natural heritage. This development stemmed from the foundations set by the Isle of Man Natural History and Antiquarian Society in 1879. This Society has been instrumental in stimulating public support for the concept of preserving the island's heritage. Tynwald acknowledged the strength of public feeling and established the Manx Museum and National Trust to preserve the Island's monuments and to develop a collection of material culture representing Manx cultural and natural heritage.

Through time, the Trust has responded to concerns at the increased loss of traditional buildings in the countryside together with the customs, crafts and skills associated with the rural communities through campaigns of recording and collecting material and non-material culture, as well as acquiring landscaped of particular scenic, cultural and natural value. Of particular significance was the opening of the first publicly-owned open air folk museum in the British Isles in the village of Cregneash in 1938.

The Government is proactive in recognising, safeguarding and promoting Manx values and practices. The preservation and promotion of a 'sense of Manx identity' has become an explicit aim and primary objective of Government Policy. This can be seen in a variety of different Government initiatives including: the creation of

the Isle of Man Arts Council and the Manx Heritage Foundation (renamed Culture Vannin in 2014) together with the appointment of a Manx Language Development Officer and Manx Music Development Officers. The promotion of the Manx language has been developed in a variety of different ways including: a Manx language nursery programme (Mooinjer Veggey); a Manx language primary school (Bunscoill Ghaelgagh); provision of Manx language lessons in the Island's primary and secondary schools and the development of a Manx Gaelic GCSE; Manx language broadcasting; publication of Manx language books for all ages (in particular children's books); and developing Manx language resources for all ages (in a variety of media including online & social media) and for the increased use of Manx in the private and public sectors.

Knowledge and practice of Manx music and dance has been maintained and promoted at many levels, through informal but regular Manx music sessions in local public houses and a variety of local Manx dance groups where members can learn traditional dances and perform at events both on and off the Isle of Man. More formal initiatives are led by the Manx Music development officer through work in the schools and in music workshops and concerts, in particular for young musicians, and in developing Manx music resources. The aims and objectives of the various initiatives for the development of the Manx language, music and dance is to ensure that there are an increased number of opportunities for all ages and skill levels to be able to learn, participate and engage with traditional values and practices.

There has been and continues to be promotion of the Island's natural, historic and cultural heritage as an important part of the Island's tourism 'product'. Its distinct heritage has been a unique selling point (USP) that has been explicit in its promotion as a tourist destination since the 19th century. The Island's heritage is an important part of ongoing and new tourist initiatives such as the Manx Walking Festival, and the development of a Manx Pilgrimage trail and of 'Faith Tourism'; linking the Island to a growth in interest in Celtic Christianity and spirituality.

The Memorandum of Understanding between Manx National Heritage and the Department of Education and Children (DEC), signed in 2004, formally adopted the aim of working together to achieve 'a measurable improvement in the provision for and delivery of Manx heritage in the curriculum in terms of culture and history, including language where applicable, for Island educational institutions in line with the Education Act of 2001: 'The new agreement provided a system of formal co-operation between the two agencies of Government to ensure that all children in the Island's schools receive the best possible access to the various heritage resources as they study Manx culture, history and language as part of the new National Curriculum'.

All teachers new to the Isle of Man are introduced to the Island's parliament, heritage and culture through an annual programme and visits. Island schools are supported in the teaching of key aspects of Manx history, heritage and culture through online provision, resourcing and staff training. The Advisory Teacher for the Manx Curriculum provides advice, resources and training to schools about how best to reflect a Manx context within the curriculum they offer. The Citizenship, Geography, History and Art curriculums have been rewritten to reflect Manx context, with the Music curriculum due to be completed September 2015. These

curricula have all been written in line with the Education (curriculum) (No.2) Order 2004:

"The following principles shall apply to the curriculum for all pupils of compulsory school age:… where appropriate, the content of all subjects shall include references to Manx Culture and history;...

Events such as the DEC Manx Folk Awards, Manx National Heritage school workshops, Culture Vannin resources and schemes (including Feddan – Manx whistle) plus many other external agencies working to produce curriculum materials for DEC, all contribute to the successful delivery of key aspects of the curriculum in a Manx context.

The proactive safeguarding and promotion of the Island's values and practices is undertaken by a wide variety of Government agencies and various groups and individuals on the Island as well as being a stated part of Government policy and an important contributor to the desire to maintain and support the Island's 'quality of life'.

15.6.3 How should cultural values be integrated in the development process: elements of identity, traditional knowledge, social organizations, etc.?

For the future, it is imperative to boost the potentials of the associations/clubs and individuals who wish to volunteer to preserve and pass on the regional natural and cultural heritage. One possibility is the recognition of their performances and the social relevance of sustainable development through the actions of the biosphere reserve and partners such as Culture Vannin and Manx National Heritage. Local actors would therefore see their important roles confirmed and their commitment adequately recognized by the public. Another possibility is to involve and further qualify skilled persons with traditional knowledge (e.g., handicraft techniques, apiculture, preservation of foods, regional cuisine, applications of medicinal and aromatic herbs) into the educational programme of the biosphere reserve, in collaboration with numerous external partners and, also independently of them, provided by other institutions (e.g., adult evening classes).

The Working Group for Manx Culture meets at least once a term, to strategically develop working practices among the key stakeholder organisations. Members within the group include officers from Culture Vannin, Manx National Heritage, DEC Advisors for the Primary and Secondary Curriculum, and the Manx Language Development Officer. The group is supported by Ministerial representation from the DEC and DEFA. Further relationships could be forged by extending the scope of the existing group to include the Isle of Man College, Department of Economic Development and non-Government agencies in the voluntary and commercial sectors.

New opportunities for partnerships are always being developed with initiatives such as Faith Tourism (Department of Economic Development, Manx National Heritage & the Isle of Man Diocese), gaining momentum. It is envisaged that further such efforts to promote both natural and cultural heritage in an integrated way could be pursued.

15.6.4 Specify whether any indicators are used to evaluate these activities. If yes, which ones and give details.
(Examples of indicators: presence and number of formal and non-formal education programmes that transmit these values and practices, number of revitalisation programmes in place, number of speakers of an endangered or minority language).

There are a variety of indicators that can and have been used to evaluate activities, these include the number of people identifying themselves as Manx speakers in censuses, the number of children taking Manx Gaelic classes in the Island's schools, the number enrolled in the Manx language nurseries and primary schools, and the number of adults attending formal and non-formal Manx language classes around the Island.

Other indicators include attendance figures for events such as Yn Chruinnaght (the Island's Inter-Celtic Music Festival) together with the other Manx music festivals/ concerts and music festivals organised by the Island's Manx Music Development Officer. Manx National Heritage maintain records of numbers attending their education workshops and sessions (both formal school and lifelong learning sessions) and public event programming at their various sites e.g. lectures, guided tours and walks, events at sites such as Manx Hop tu naa (Manx 'Halloween') and May Day celebrations. The uptake of schools within the Manx Folk Awards has risen, with greater participation in 2014.
www.isleofman.com/news/video/62938/Island-of-culture-manx-folk-awards

Another indicator of community involvement can be seen in the membership figures for organisations such as the various local community heritage groups e.g. Peel, Castletown, Ramsey, Laxey & Sulby (new groups are still being formed around the Island) and specialist interest groups such as the Jurby Transport Group and Manx Military & Aviation Museum.

Heritage Open Days (an annual festival co-ordinated by Manx National Heritage) has grown from four events in 2010 to 80 events, involving 40 heritage partners, planned for 2015. The festival aims to bring together heritage providers across the island to promote the range and depth of culture specifically to the local community over a focussed period in the calendar.

There are a wide variety of formal and non-formal opportunities for the Island's population to engage with the Island's natural and man-made heritage. This includes programmes of lectures, seminars, workshops, guided walks and displays provided by Manx National Heritage, the Centre for Manx Studies (University of Liverpool), Isle of Man College, the Island's various heritage groups and the Isle of Man Natural History and Antiquarian Society.

Formal educational programmes taught within Manx National Heritage schools' programmes are measured through quantitative and qualitative mechanisms recommended by (GEM) Group for Education in Museums.

http://www.inspiringlearningforall.gov.uk/toolstemplates/genericlearning/

16. LOGISTIC SUPPORT FUNCTION:

16.1 Research and monitoring:

16.1.1 Describe existing and planned research programmes and projects as well as monitoring activities and the area(s) in which they are (will be) undertaken in order to address specific questions related to biosphere reserve management and for the implementation of the management plan *(please refer to variables in Annex I).*

The Isle of Man has a reasonable range of skills and capacity to carry out on-going research and monitoring internally. Additional capacity from outside the Island can be required for more specialist skills, and links are established and developed to address this issue.

Table 24: Research and monitoring - Terrestrial

Research and monitoring	Zone	Where undertaken and by whom
• Ground water levels, • Bird breeding success, especially little terns and other ground nesters • Rare plant distribution, especially dune slacks and strandline, • Rare invertebrate distribution	Core	Ayres National Nature Reserve (DEFA)
• Seabird breeding success, • Migratory bird passage by ringing, • Effectiveness of brown rat control	Core	Calf of Man (MNH)
Monitoring effectiveness of section 27 and 30 management agreements. • Orchid counts	Core and Buffer	All ASSIs
Effectiveness of nature reserve management	Core and Buffer	Manx Wildlife Trust
Monitoring of special interest on ASSIs • Lesser Mottled Grasshopper on Langness • Orchids on ASSI grasslands with management agreements	Core	DEFA
Site survey for new protected areas (potential Core)	Buffer	Areas identified in DAFF Phase 1 habitat survey. (DEFA)
Checks on effectiveness of farm management in maintaining quality of the countryside	Buffer	Farms in Countryside Care Scheme (DEFA)
Biological and chemical river water quality, including • Invertebrates • Heavy metals • Dissolved oxygen • Biological Oxygen Demand • Nitrates • Phosphates	All island	Selected sites on watercourses (DEFA)
Other biological monitoring • Bats	Mainly Core and Buffer	Various wildlife organisations and individuals – data collated in Biological

• Butterflies and moths • Lizards • Fungi • Plants		Recording Partnership's database.
Waste production • Total amount controlled waste deposited at licensed sites	Transition	DEFA
Flooding	Transition	Manx Utilities Authority
Trends in breeding birds	All island	1/10th island per year undertaken by Manx Birdlife and funded by DEFA
Bird distribution and abundance from public sightings scheme	All island	Manx Birdlife
Changes in ecosystems, abundance and type (by remote sensing)	All Island	DEFA
State of conifer plantations • Pests and diseases	All Island	DEFA
Invasive species (terrestrial and marine) additions and distribution	All island	Public and specialists sending data to Biological Recording Partnership's database
Meteorological monitoring, including • Rainfall (daily and hourly) • Temperature (air ground and soil, 5, 30 and 100 cm depth) • Evapotranspiration • Wind speed and direction • Humidity • Air pressure • Tide heights at 5 harbours	All island	Main Meteorological Station is at Ronaldsway (DOI) and at a network of auto stations around the Island, Mainly wind station at the ports, but rainfall stations at many sites on the hills (Cringle, Block Eary, Sulby Reservoir, Beinn y Phott, West Druidale, Lhen, Injabrek, and Laxey).
Salmonid (salmon and trout) monitoring	Al island	DEFA

Meteorological Records have been kept since 1947.

Table 25: Research and Monitoring - Marine

Research and monitoring	**Zone**	**Where undertaken and by whom**
Biodiversity in Ramsey bay Marine Nature Reserve (MNR)	Core	DEFA
Shellfish stocks in Ramsey Bay MNR	Core	DEFA and Manx Fish Producers Organisation
Grey seal surveys	Core	Calf of Man - Manx Wildlife Trust, MNH

		and Volunteers
Shellfish stocks in other fisheries management areas	Buffer	DEFA (Bangor University, Manx Fish Producers Organisation)
Marine biodiversity survey and mapping	Buffer and Core	DEFA, Seasearch divers with links to Heriot-Watt University and other partner organisations.
Radioactivity (in seaweed and seafood)	Buffer	Around island coast, DEFA
Bathing water quality (20 weeks a year) • Coliforms	Buffer	19 beaches. DEFA
Whale and dolphin surveys • Numbers • Locations • Behaviour • Photo identification	All Manx waters	Manx Whale and Dolphin Watch (DEFA support)
Basking shark research • DNA and photo identification • Population composition • Movements (tagging) • Behaviour • Locations	All Manx waters	Manx Basking Shark Watch and Manx Wildlife Trust (with DEFA support)
Seawater monitoring, including • Temperature • Salinity • Dissolved oxygen • Dissolved inorganic nutrients • Nuisance/toxic algae • Chlorophyll • Water column profiling • Heavy metal monitoring • Sediments	All Manx waters (specific sampling points)	DEFA/Government Laboratory.
Other marine monitoring; • Rocky shore biota • Seafood products	All Manx waters (sampling points)	Rocky shore - Southampton University with DEFA support
Marine Litter • Quantity • Origins	All Manx waters	Marine Conservation Society, MWT, Beach Buddies

Isle of Man Government DEFA
All-Island aerial photographs are obtained by Government on a regular basis and used for land mapping in ARCGIS software. These are used by DEFA for monitoring/surveillance of changes in land management and natural succession of ecosystems. We are investigating the use of remote sensing techniques to identify ecosystem changes and enable regular review.

Bangor University's School of Ocean Sciences is contracted to provide underpinning science and fisheries advice to the Isle of Man Government with respect to use of its marine natural resources.

http://www.bangor.ac.uk/oceansciences/research/php/theme.php?project=457

Centre for Manx Studies

The Centre runs:

- postgraduate programmes, with research on a wide range of Manx topics. This has significantly contributed to scholarly knowledge and understanding of Manx history and culture.
- annual public seminar series to showcase recent and on-going research in Manx or Manx-related subjects by the Centre's staff, students, and research fellows, as well as by visiting researchers.
- a six-week archaeological field school, based in Ireland and the Isle of Man.
- an annual four-week training excavation on the Isle of Man.
- numerous international academic conferences.

Major strands of research at the Centre include:

- *Tourism, Heritage and Identity:* Researchers have looked at the influence of the tourist industry on the ways in which Manx heritage and identity have been represented over the last two centuries.
- *The Long Iron Age* project aims to construct a coherent chronological sequence of Manx settlement types from the late Bronze Age to the arrival of the Vikings, and to then compare this sequence with those in other regions around the Irish Sea and the wider Atlantic seaboard.

Research Collaborations
Staff and Fellows at the Centre for Manx Studies collaborate with scholars outside of the Isle of Man. For example, the Centre has been developing links with the University of Glasgow's Solway Centre (within the recently designated Galloway and Southern Ayrshire Biosphere Reserve), and is investigating collaborative research and joint funding between the Solway Centre and the Isle of Man on rural sustainability, tourism, and folklore.

Madrid Action Plan Targets 28 and 29: Exchanges and Partnerships between Biosphere Reserves.

Isle of Man College
Isle of Man College runs an undergraduate BA in History, Heritage Management and Manx Studies in association with the University of Chester and with assistance from the Centre for Manx Studies.

Planned research and monitoring

DEFA plans to study the effect of hydrology of marine currents on scallop recruitment and growth rates. It is also looking at persistent hydrographic fronts in the Manx Territorial Sea and their influence on ecosystems and ecosystem functioning.

Flooding
The Meteorological Office plans to install river depth gauges on the Main Rivers to assist with flood control planning.

Geology
Knowledge of the Isle of Man's rich earth science heritage has been much enhanced in relatively recent times by preparatory work for the updated map of the solid and drift geology of the Isle of Man together with the associated research report (British Geological Survey 2001). This built on Lamplugh's original geological survey and resulting maps (1892-1913), examining new sites and re-examining others and leading to some significant new interpretations of the exposures available to scientists.

Citizen Science: Citizen science is an important part of marine research in the Isle of Man, and also enhances community involvement and relevance to the local environment. Public sightings are an essential part of the research of Manx Basking Shark Watch and Manx Whale and Dolphin Watch. Volunteer Seasearch divers have carried out hundreds of site surveys around the Isle of Man in the past 10 years. "Bioblitzes" (an event where scientists, naturalists and members of the public work together to find as many species as possible within a set location and over a defined time period, for example over 24 hours) have been run, and more could be done to expand biological records. The public are engaged through periodic press releases about new finds, invasive species and charismatic species. Monitoring of seashore and subtidal for marine invasives is underway using a working group of voluntary organisations; this is planned to expand.

Specific events are ideal communication mediums to engage the broader population in understanding our environment alongside the events, for example the annual Queenie Festival has 6500 visitors over a weekend, the major draw being "touch-tanks" staffed by Manx Wildllife Trust with local marine species to enable visitors to understand what flora and fauna live close to shore, as well as try local produce. 15,000 people visit the DEFA and MWT tents at the annual Agricultural Shows, the single highest attendance event of the year.

Ongoing projects include:

Manx Whale and Dolphin Watch www.mwdw.net, running since 2006, which set up a successful innovative website where members of the public could report sightings and where these took place, and upload photos. All this data provides effort-based survey data. The project also provides training for locals to be able to identify species they may see, and post this information around harbours. The project also operates a small research vessel for grid searches as sea. There over 3000 public reported sightings logged, which has allowed the first ever scientific assessment of the population of various species, which would not be possible without the "Citizen Science" element. The harbour porpoise resident population in Manx waters has now been assessed as 900-1050 individuals.

Manx Basking Shark Watch (now an independent charity)
http://www.manxbaskingsharkwatch.org In 10 years, over 1000 people have registered over 3000 sightings on the website, indicating a significant Basking Shark population. The charity also operates a small research vessel for marine research, which includes tagging, which contributes to international research.

Beach Buddies. (independent Charity)
https://www.facebook.com/pages/Beach-Buddies-Isle-of-Man/117658954956301
This was started in 2006 by an individual keen to collect marine litter and remove it from beaches and shores. By 2014, 2930 volunteers participated in organised beach cleans, including over 1500 new volunteers. In total, over 3500 bags of beach plastics and litter were collected, representing over 150,000 pieces of litter removed (excluding larger items like car tyres and fish boxes that are also removed). The charity has now sought sponsors to provide Beach Buddy Bins on as many beaches as possible. Each Eurobin holds plastic bags for passing members of the public to pick up and take as they pass to pick up litter as they carry on their walk, and deposit when they return. This has made a noticeable improvement in keeping beaches clear of litter for longer. An estimate of total numbers of volunteers is not possible, but it is certainly much higher than those attending organised activities. There may also be scope to roll out concept to glens, plantations, footpaths and other areas. This group has yet to carry out scientific research on its work, but is open to doing so.

Sea Search (Isle of Man):
https://www.facebook.com/groups/327423355132/ Seasearch is a project for volunteer sports divers who have an interest in what the see under water, want to learn more,and want to help protect the marine environment around the coasts of Britain and Ireland. The group is very active in monitoring sea bed and near shore zone around the Isle of Man, for example providing a lot of surveying work for the Ramsey Marine Nature Reserve research and on-going monitoring.

Open Elm (DEFA) www.openelm.org.im This is a crowd-sourced Dutch Elm Disease monitoring project using the community to protect the Isle of Man's Elm trees. Its aim is to harness the power of the public to help create a detailed profile of the Island's elm tree population, and to help identify and report trees which may be infected with Dutch Elm Disease. The website enables members of the public to submit the location, health and a photograph of an elm that may be displaying symptoms of Dutch Elm Disease. The website has iPhone and Android mobile apps which makes it easy to record trees while

people are in the countryside. Between 1968 and 1988, England lost **75%** of its elms, and even though Dutch Elm Disease has reached the Isle of Man, effective control has meant that the Island has lost less than 1% of its elms. The Island currently has a healthy elm population of over 200,000 elm trees. However, public involvement is needed to ensure it stays under control.

Significant opportunities exist to expand Citizen Science. Promising discussions have already taken place with the Open Air Laboratory **(OPAL) project** in the UK http://www.opalexplorenature.org about collaboration and involvement in this project. OPAL commenced in 2006, funded by Lottery Funding and led by Imperial College London. It expanded in 2014 to cover Scotland, Wales and Northern Ireland, as well as England, but not the Isle of Man. It would be plausible to apply for UK Lottery Funding to expand this project's remit to cover the Isle of Man.

16.1.2 Summarize past research and monitoring activities related to biosphere reserve management *(please refer to variables in Annex I).*

Abiotic

Air quality parameters have been recorded (1997-2009), including particulate matter, carbon monoxide, nitrogen dioxide, sulphur dioxide and ozone. All of the Island's monitoring sites complied with European Directive 80/779/EEC with occasional exception of particulate matter at the Quarterbridge Roundabout (Douglas) monitoring site and ozone assumed to be from the UK / Europe.

An evaluation of **carbon stores in soils** was made in 2011. Provisional estimates of soil carbon in the Islands soils equate to 17,450,000 tonnes CO_2, or 25 times the annual CO_2 emissions of 700,000 tonnes from the entire Isle of Man's economy.

Biotic
The Centre for Manx Studies has researched the **history and archaeology of the Manx flora and fauna** and has worked on environmental material from excavations on the island where suitable biological materials are preserved.

Socio-economic
In 2012, **economic valuations of ecosystem services** for each broad Manx terrestrial ecosystem were assessed using value transfer methods. Six economically important ecosystem services are valued: outdoor recreation, aesthetic enjoyment of the landscape, nature related tourism, flood control, water supply, and water quality regulation. The total annual value of these six services was £42 million. This study was funded by DEFA. (Brander and McEvoy, 2012)

In 2013 **economic valuations for three marine ecosystem services** were calculated. Using a combination of existing data and benefit transfer, the following benefits were partially valued: food (scallops), carbon sequestration, waste processing and tourism linked to the marine environment. The figures above

represent examples of figures from some marine ecosystem services, but many more have not yet been assessed. The separate valuations are not presented as a single combined figure because they were obtained using very different valuation methods. Values are likely to be conservative, having been estimated and approximated. (Mead, Beaumont and Austen 2014).

Integrated monitoring

Centre for Manx Studies:

There has been considerable research undertaken on the Isle of Man, there are over 7000 separate pieces of bibliography listed through the Centre for Manx Studies (CMS) (a research outstation of Liverpool University) and the Manx Museum library/archives which opened in 1992. Partly this is due to the Port Erin Marine Biological Station of Liverpool University being present on the Island from 1892-2006 and its inherent research activities. Recent activity for Theses are over 100 in number and cover range from biotic, abiotic, archaeological and socio-economic topics. Staff from CMS, in its short life have already provided over 2000 pieces of research. There are also over 1600 references for archaeological research and over 700 in abiotic and geological topics. See http://manxstudies.liv.ac.uk/sm/biblio/bibliographies.htm for further details.

- *Manx language* "Practical Manx", the first comprehensive and authoritative grammar of the Manx language for a century, has been published.
- *Music*, publications relating to Manx music, including collections of music from the Isle of Man, have been published.
- *Folklore* studies of Manx Folklore, resulted in journal articles and conference presentations.

16.1.3 Indicate what research infrastructure is available in the proposed biosphere reserve, and what role the biosphere reserve will play in supporting such infrastructure.

The biosphere reserve is not in a position to support formal academic research infrastructure at this stage, although could develop partnerships with other organisations which may do so. Existing research infrastructure is listed in Table 25.

Table 26: Research Infrastructure

Research infrastructure	Facilities	Role in relation to Biosphere reserve
Isle of Man Government Laboratory	Analytical	Monitoring, especially marine parameters.
Centre for Manx Studies	Postgraduate, Masters programmes and PhDs, public engagement and research collaborations.	CMS is a partner in the project. Opportunities to be developed.

Isle of Man College (in association with the University of Chester and with assistance from the Centre for Manx Studies)	BA in History, Heritage Management and Manx Studies	To be developed, including undergraduate research
King William's College	Public secondary school which offers the International Baccalaureate	To be developed

Table 27: Links to Research Establishments off-island.

Research infrastructure	**Facilities**	**Role of Biosphere reserve**
The National Biodiversity Network, UK	Biodiversity records are gathered by organisations and individuals. The IOM government (through DEFA,MNH ,non-government wildlife-related organisations all collect and use biodiversity data.	Isle of Man biological data is sent to UK NBN, which in turn supplies GBIF, so all biodiversity information is available locally and internationally.
Bangor University, School of Ocean Sciences	Contracted to provide underpinning science and fisheries advice to the Isle of Man Government with respect to use of its marine natural resources.	Has an important role in the sustainability of the marine environment.
Southampton University	Project to monitor climate change and invasive species impacts on rocky shores.	Some monitoring sites within core areas. A long-term study which will inform future coastal management.
Heriot-Watt University	Collaborative research into Manx horse mussel reefs, part of a PhD project.	Includes genetic studies which will help inform on genetic biodiversity. Horse mussel reefs are protected within core area.
Solway Centre (University of Glasgow)	The Solway Centre brings together the study of environment and culture. The centre combines expertise in tourism, ecocriticism, heritage, cultural studies, ecology and environmental science	To be developed. Initial discussions have taken place.
Marine Climate Change Impacts Partnership (MCCIP)	MCCIP synthesises broad based evidence on how climate change is affecting our coast and seas and its impacts	Isle of Man data is included so results will be relevant for climate change adaptation work.
Marine Environmental Change Network	Data holding and sharing.	The Isle of Man holds long-term marine environmental data series which can be made accessible to other MECN partners for collaborative research.

16.2 Education for sustainable development and public awareness

Environmental education is seen as important and is provided for all 12,000 primary and secondary pupils in the Island's schools. This takes many forms. The Department of Education and Children (DEC) has a curriculum entitled Essentials for Learning, which is followed by all schools. Environmental education may appear in Science and Geography but could also appear in cross-curricular dimensions in the context of the Global Dimension, Manx Heritage and Culture and Citizenship. Island schools are also encouraged to follow the Eco-Schools programme where possible. Wikipedia pages are developed for educational value, see https://www2.sch.im/groups/ecoschools/wiki/0cb01/Ecomann_Website.html. The website is arranged according to the nine areas of the Eco-Schools topics and is focused on local resources and organisations who can support the teaching of environmental issues. Schools are supported in their environmental work through many local organisations, plus online provision on the EcoMann website supported by DEC and the Department of Infrastructure.

In secondary schools, all pupils must study Science in Years 7 – 11; this covers environmental aspects at a variety of scales including photosynthesis, ecosystems, Earth and atmosphere, and energy. Many of the Island's sixth form biology students have completed fieldwork between low and high water marks, working with an officer from the Field Studies Council. The study of Geography by all pupils in years 7 – 9, and by about 40% of students in Years 10 and 11, includes the study of weather, climate, biomes, rivers and coasts. All schools undertake local Geography fieldwork. For GCSE, all secondary schools undertake a study of the River Neb from source to mouth.

The Department of Education and Children (DEC) has worked with schools and other partners to support environmental understanding. For example, subject leaders in Geography worked with the Isle of Man Heritage Foundation (now called Culture Vannin) on a professionally made DVD on coastal erosion in the Isle of Man. This is presented in a series of 10-minute lesson starters covering erosion, longshore drift, deposition and political responses. A similar DVD has been produced on mining in the Laxey area. An identification sheet for flora and fauna on rocky shorelines has been produced in full colour for primary pupils. Its launch was complemented by training for primary teachers.

Science and geography departments study energy production and impact as part of their normal curriculum. These explore the technological aspects. The Religious Studies GCSE short course also has a module on Religion and Planet Earth which looks at the problems facing the world and methods to address them from an ethical perspective. Students undertake practical environmental work for example making bird boxes, paper briquettes, and tree planting. Citizenship lessons raise awareness of economics and politics involved in energy production. Issues such as energy security and the reliance of imported power are discussed. Enrichment week enables younger students to participate actively in recycling initiatives.

Schools also make use of local opportunities and resources such as the Geological nature trail (limestone, volcanic intrusions and lava) at Scarlett, just a few minutes'

walk from Castle Rushen High School. This school created the Island's first recycling "bring-site", obtaining permission to site a recycling skip in a local car park.

Schools in the Isle of Man are encouraged to "live on a large map" and undertake a considerable number of education visits and residential trips each year. In the 2013-14 school year, Ramsey Grammar school, for example, provided 502 visits. 12 residential visits provided 1,793 residential student-days off Island including a Spanish exchange. During "Standalone" week in July 2014, 60% of the school's Key Stage 3 pupils (aged 11-14 years) will travel off-Island. Ballakermeen High School operates an annual exchange visit with No 1 School, Liuyang in China as well as a German Exchange. A positive achievement rewards scheme at Ballakermeen sees students awarded "Ballavivo" points which can be redeemed in a school shop or online. Following the Typhoon Haiyan disaster in the Philippines, students at the school donated 38,000 of their hard-earned points, worth £380, to the disaster appeal. Students from St Ninian's High School raised funds to build a school and travelled to help complete the construction in Kiwumu, Uganda. St Ninian's is also a designated Fairtrade school with a long-standing commitment to trade justice.

All of the Island's schools participate in the Duke of Edinburgh (DofE) programme, and the Department of Education and Children is an Operating Authority for The Duke of Edinburgh's Award. Young people can often be seen in open countryside undertaking expeditions for these awards. In total there are over 800 young people aged between 14 and 25 involved in the DofE programme at any one time (http://manx.net/isle-of-man-news/69651/ardwhallan-expands-its-role-in-the-duke-of-edinburgh-s-award-) which is seen as a pro-active means for young people working towards bronze, silver and gold awards. The 'volunteering', 'physical' and 'skill' sections encourage young people to get out into the community, helping others or taking part in positive activities.
DofE is a highly recognised addition to young people's work skills and is welcomed by educationalists and employers, and is often seen as a complementary part of university application places. The DEC youth division offers residential opportunities and young people have recently completed the construction of a Viking longhouse as part of a wider project.

Ramsey Grammar School, one of the Island's five secondary schools, has a farm with specialist units for sheep and pigs as well as horticulture. Students learn about animal breeding, animal husbandry, soil management and horticulture but perhaps more importantly they study theoretical and applied science through this practical work. Sometimes this involves extended projects relating to the growth and development of lambs and piglets. They may also focus on environmental issues and business management. The animals on the farm are not pets, and the school has "Farm-Assured" status. Meat produced at the school enters the food chain and is sold through local butchers, labelled as Ramsey Grammar School pork and lamb. The school canteen sells Ramsey Grammar School sausages when available. All students study rural science as an element of their science curriculum in Key Stage 3 (11 – 14 years), and students can then opt to study Environmental and Land-based Science at GCSE and Environmental Science at A Level.

As part of the organic Carnane Estate on Douglas Head, The Children's Centre, another Educational Partner in the Biosphere Isle of Man project, is developing a Community Farm. The Farm has approximately 15 acres of land comprising a five acre conservation area, two polytunnels, a vegetable patch, a kitchen garden and a 'projects' field. The land is managed in accordance with Soil Association Organic Standards and, as the project develops, more animals are being introduced including pigs, hens, rabbits, goats, bees and donkeys. The Community Farm provides a therapeutic and nurturing countryside environment, where people can grow their social skills and self-confidence, as well as the opportunity to learn and develop new practical skills. Alternative education is provided for young people who are struggling with mainstream education, and they are given the opportunity to turn their new found knowledge of horticulture and agriculture into qualifications and Open College Network awards. The Farm is open to the Island's community and offers an increasing range of services to meet the community's needs. For example, the Farm is working with primary and secondary schools to deliver an educational programme that enriches the academic curriculum; and it is liaising with community groups and other charities to provide a unique venue for broad range of service users. The Children's Centre's aim is to ensure that the Farm is used by as many of the Island's children, young people and families as possible, providing them with a natural environment where they can enhance their well-being, learn about the countryside and farming, develop new skills and (where appropriate) gain relevant qualifications.

There has also been recent interest in the concept of Forest Schools, which is being investigated as a kindergarten and after-school concept.

In June 2014, students at Ramsey Grammar School attempted to break a world record for the largest beach clean with several hundred students involved in cleaning beaches across the north of the Island. Several new school buildings have a high level of environmental specification including the provision of ground source heat pumps to reduce energy use and emissions.

At the Peel based Queen Elizabeth II High School, students formed an eco-committee under the leadership of a dedicated member of staff. Having calculated the amount of energy used by pupils travelling to school, a project to plant over 3,000 trees to compensate for the carbon emissions was organised. Students also explored energy consumption at school and raised awareness of how to reduce this. With the support of the administrative staff, they made teachers aware of the amount spent each month on electricity with the aim of reducing the amount used and also the bills. The DEC's works division helped the committee by planning the replacement of old light fittings with more energy efficient ones which automatically switch off when the room is empty. The works division has also checked the school's insulation and is gradually improving this. In 2014, the school won $50,000 Zayed Future Energy Prize. They are now hoping to get a wind turbine or Solar PV panels installed by the end of the year. The most recent development has been the installation of a biomass boiler, which enables the school to stop using oil for heating and hot water. The eco committee has produced short films and power points of work undertaken. Meter readings are taken automatically by the local Manx Electricity Authority (MEA). Gas and biomass usage are monitored by the Works division inspectors. Information is shared with the school bursar who informs the eco committee. The eco

committee is starting to use the readings to compare energy costs and consumption since the installation of the biomass boiler.

At St Ninian's High School, a Year 8 unit of work in Geography on "My world; my responsibility" involves pupils visiting the Island's Energy from Waste Plant. Pupils from the school were asked to consider how the plant works, and why it was chosen as a suitable option for waste management and energy generation for the Isle of Man.

Beyond schools, The Isle of Man College of Further and Higher Education offers Level 3 courses in Environmental Conservation and Agriculture. A total of 73 students from the Isle of Man are currently studying on university undergraduate courses related to Geography, Biology and Environmental Studies.

Undergraduate Research Projects

Manx students are well integrated into work-related research for undergraduates, which includes the STEP programme as well as work through Centre for Manx Studies and the Manx Museum. Every year, STEP recruits the UK's brightest and most enterprising undergraduates and matches them with the specific needs of small organisations to undertake a skill-centric project to improve the business. The STEP projects are funded by public and private sector project sponsors. Over the past 10 years, this has led to 240 research projects on the Isle of Man, which is relevant for students to get work related experience, and valuable for sponsors to get an enthusiastic student to investigate and work full time on a work-related project for 10-12 weeks and its resulting report. https://www.gov.im/categories/working-in-the-isle-of-man/step-scheme/ Included in the range of topics supported by the scheme are environmental topics such as energy surveys, coastal studies, environmental management audits, approximately 15% of the projects would be in these environmental topic areas.

The One World Centre focusses on Education for Sustainable Development for school pupils and members of the General Public, covering:

- Global Village: Bringing people who live on the Isle of Man and who come from different cultural heritages to come together on the Manx National Day, Tynwald Day, and enjoy interacting with each other. This includes:
    - Stalls run by charities working overseas
    - Food stalls representing different cultures
    - Country stalls (e.g. names being written in Chinese characters)
    - Competitions
    - Music and dance
- One World Week: Held in October each year, this is an opportunity to encourage people across the Island to consider an aspect of the challenges of living in a developing country. In 2013, the theme was sharing food more equitably and in 2014, sanitation.

- Global Tree Trail: Working with the Forestry Department, the One World Centre produced a trail round Garey ny Cloie (the public gardens outside the office) to enable people to appreciate the wide variety of trees from six continents.
- Primary Fairtrade Conference: An annual opportunity for 4 delegates from up to 18 schools to spend a day in the government buildings experiencing a keynote speech, a richman/poorman snack, a circus of workshops, and a planning session to prepare for Fairtrade Fortnight (usually the last week in February and the first in March).
- One World Charity Challenge: Students in Year 12 work in groups to put together a multi-media presentation about a charity with links to the Isle of Man but which works overseas. This is anchored in an understanding of development issues and highlights the impact of the charity's work on the life of a young person.
- Training: CPD in Global Learning, including the Global Teacher Award, is offered to schools.
- Workshops: Workshops on a range of themes are offered in response to requests from schools and other groups (guides, Women's Institute, Mother's Union, and Retirement Association).

There may also be interest amongst some schools and partners into investigate becoming UNESCO Associated School status. The projects and activities covered through this theme are noted as being, the UN system and World Concerns, Education for Sustainable Development, Peace and Human Rights and Intercultural Learning. Subject to the schools' level of interest this may well complement work already on-going for Eco-Schools topics.

16.2.1 Describe existing and planned activities, indicating the target group(s) and numbers of people involved (as "teachers" and "students") and the area concerned.

Table 28: Facilities for Environmental Education and Public Awareness

Existing activities	Target groups	Numbers involved	Area concerned
School Education – including Education for Sustainable Development	Pupils within school – as part of Eco-schools work	12,000 children, 500 teachers	From all over the Island
Curraghs Wildlife Park schools programme	Primary and secondary school children	1126 children, 1570 adults,	From all over the Island
Curraghs Wildlife Park public education programme	Families	50,000 annual visitors – who could all be regarded as potential students	From all over the Island
Manx Wildlife Trust education programme	Key stage 2-4 school children	2000 children 200 teachers/adult helpers	All Island schools and Isle of Man College
Manx National Heritage – free access to sites –through Arts Culture and Education (ACE) cards,	Children and students	14,000 cards distributed each year.	From all over the Island

sponsored by Business			
One World Centre	School Pupils and IOM population through maintaining IOM FairTrade status for IOM	5 of the 6 secondary school entered OWC Fairtrade competition, with over 2000 pupils entering	All island, focusing on FairTrade issues, poverty etc.

A wide range of environmental education activities are provided to local school children by the Manx Wildlife Trust (MWT), primarily through the services of their dedicated Biodiversity Education Officer (BEO). The BEO ensures that, over every 3-year period, every child in Key Stages 2-4 is given an opportunity to learn about biodiversity in a Manx context and, as a result, will understand what biodiversity means, have an appreciation of the values of biodiversity and the benefits it brings now and in the future. Pupils are also helped to understand the steps they can take to conserve and use biodiversity sustainably, based on knowledge of the island's biodiversity and the impact of lifestyle on global biodiversity.

The services of the BEO are made available to all local schools and the Isle of Man College in order to raise awareness of biodiversity. As well as providing activities in school, such as inter-active presentations on, for example, nature conservation, Manx wildlife, coasts and marine life and "Saving the Planet", where possible, these are followed up with outdoor visits and activities such as rock-pooling, exploring woodlands, bird watching, building bug hotels and looking at human influence on the coast. The BEO also develops and provides relevant resources and information for teachers, including inset training, to help raise their awareness of the importance of biodiversity and facilitate its integration into the Manx curriculum.
In an average school year, the BEO engages more than 2000 school children and just under 200 teachers and adult helpers in environmental education activities.

Manx National Heritage are very active in providing educational resources for all. A notable example is the Arts, Culture and Education (ACE) scheme, a joint partnership between Manx National Heritage, a private sector bank, currently Lloyds Bank and the Department of Education and Children giving all Isle of Man school children and students free entry to all national heritage sites. - See more at: http://www.manxnationalheritage.im/plan-your-visit/families/ace-card/#sthash.qoCcC87x.dpuf. Launched in 2010, the ACE scheme provides almost 14,000 ACE cards being distributed each year via the schools by the Department of Education and Children.

Primary school pupils continue to make a lasting contribution to the Manx countryside when they take part in Trees for Life 2015, which has been running since 2008, in a project called the Children's Wood, one of the 50 Plantation areas owned by the Department of Environment Food and Agriculture, run in partnership with Department of Education and Children. Each year, hundreds of children will plant trees at the Children's Wood at Conrhenny plantation. This project encourages pupils to learn about trees and ties in with DEFA's aim of promoting enjoyment of the countryside. The wood already boasts native broadleaved trees: 3,000 oak, downy birch, alder, rowan and ash saplings have been planted by pupils in previous years. Ahead of their visit to the plantation, pupils will learn how tall the trees will grow and how to measure the height and

age of a tree. They will learn about seeds, leaves, pests, diseases and planting. Under supervision from DEFA's Forestry staff, pupils will plant saplings and write their names on the protective tubes. It is hoped they will learn a lot about the importance of trees to our environment and will return with their families in the years to come to see how their saplings have grown. See more at: http://www.manx.net/isle-of-man-news/69410/pupils-learn-about-the-countryside-as-they-add-to-children-s-wood#sthash.3MIlNhM8.dpuf

It is current DEFA Forestry Division strategy to seek Forestry Stewardship Council approved status for plantations and glens.

One World Centre

A very active local charity, involved in providing specialist training to teachers and pupils on Fairtrade, global development issues etc. has been active on the Island for over 10 years. In 2008, the Isle of Man was awarded Fairtrade Island status and this is renewed regularly. In 2014 the group won an international award from the UK FairTrade foundation (www.fairtrade.org.uk) for the groups and the Isle of Man's "Outstanding Project in the twenty years of the Fairtrade Foundation's existence".

Curraghs Wildlife Park schools programme

The Wildlife Park offers 24 different educational sessions with the ability to tailor them to suit specific needs. Sessions are available for 4-5 year olds in their first year of primary school, for ages 5-7 in the first half of primary school, for ages 7-11 in the second half of primary school and for pupils in secondary school (ages 11-18). The Wildlife Park also offers a public education programme, comprising of mostly feed-time talks, animal presentations, touch tables and displays and craft activities. These run daily throughout most school holidays and weekends June-September. This will be continued and extended in the future. There is scope in the future to have educational sessions based at the Wildlife Park about the Isle of Man, including the Ramsar Wetland of International Importance which extends into the Park.

The Curraghs Wildlife Park, and its unique wetland setting within a Ramsar wetland of international importance and animals from around the world, is an exciting and inspirational place of learning for all ages. Nothing compares to coming face to face with real animals – with their help can make learning an unforgettable experience. The successful programme of education for schools has been developing since 1999, and has since then reached many thousands of school students. In 2009 the Park won a prestigious national British and Irish Association of Zoos and Aquariums (BIAZA) award for "Best Education Project", recognising the Park's high educational standards. The Park now also runs a lively Public Education Programme designed to deliver informal learning opportunities for all park visitors, which now number in excess of 50,000 per annum. With the

help of volunteers, the park runs a wide range of talks, presentations, displays and activities. The focus is always on fun and enjoyment, so it's quite likely that visitors won't even notice they are learning. Recently there has been the launch of the successful summer school, the Wild Academy.

16.2.2 What facilities and financial resources are (or will be) available for these activities?

Department of Education and Children
Financial resources remain stretched at DEC, but the role of Education for Sustainable Development (ESD), for example Eco-Schools and the value of ESD activities remain important and part of school curriculums.

Centre for Manx Studies
It is unclear as yet what resources will be available for biosphere reserve-related work. Much of the work carried out is relevant to Manx culture and identity.

The **Curraghs Wildlife Park** (part of DEFA) expects to continue employing an education officer. http://www.curraghswildlifepark.im/education/

Manx Wildlife Trust expects to continue to employ a Biodiversity Education Officer with financial support from DEFA and the Department of Education and Children (DEC).

The majority of Citizen Science projects are carried out by the Third Sector and hence are reliant on grant making bodies and voluntary contributions for their continuation.

16.3 Contribution to the World Network of Biosphere Reserves:

16.3.1 How will the proposed biosphere reserve contribute to the World Network of Biosphere Reserves, its Regional and Thematic Networks?

The inclusion of an entire jurisdiction with extensive marine as well as terrestrial areas offers something special to the WNBR and its networks. The partners in the proposed biosphere reserve are keen to engage actively with UK and other European biosphere reserves, and have already established useful contacts. Some areas of the Isle of Man's recent experiences in economic, social and environmental issues would be useful and relevant to communicate to a wider audience. The Partnership would be interested in investigating further ecosystem-specific networks. This should provide valuable insights into sustainable development models and climate change mitigation and adaptation possibilities elsewhere in the world, particularly with other members of the WNBR.

We will investigate joining thematic networks and possibly the recently established Biosphere Smart initiative. The Isle of Man would be keen to become actively involved in programmes such as this, and can identify Isle of Man projects that could be regarded as case studies and referenced on this site.

16.3.2 What are the expected benefits of international cooperation for the biosphere reserve?

The Isle of Man would welcome the opportunity to learn from global experiences and share the Manx story with others. Although the Isle of Man is not part of the EU and is not eligible for EU funding programmes, international research and engagement are encouraged, and partners from the Island can take part of EU-funded projects at their own cost.

We can benefit the WNBR by demonstrating that an entire nation approach to sustainable development is possible for other small countries (especially SIDS), covering the three pillars of sustainability; being a vibrant society, having a healthy environment and developing a thriving economy. Benefits to the Isle of Man will be to increase credibility, profile and recognition as a helpful partner for other small countries.

The Isle of Man's international co-operation ethos is best demonstrated by the activities of the International Development Committee and its funding priority of other small countries through:

1. **The establishment and ongoing support of the Small Countries Financial Management Scheme**

The Isle of Man Government Treasury provided the initial funding and helped to develop the programme in conjunction with the World Bank, the Commonwealth Secretariat, the Small States Network for Economic Development, and a leading faculty from the University of Oxford. Its purpose is to contribute to the growth and prosperity of small countries through capacity building in the government financial sector with a strong focus on financial integrity, prudent regulation, and economic management. (see www.scfmc.im).

The Small Countries Financial Management Programme (SCFMP) was established in 2009 to provide a tangible way in which the Isle of Man could use its financial expertise to benefit small developing countries around the world, including nations from Africa and the Caribbean, and Pacific and Indian Ocean Regions. Between 2009 and 2014, 29 small countries and 146 senior officers from these countries benefited from involvement in the SCFMP. Each year up to 24 participants can benefit from the programme.

The Isle of Man Government, for example, donated a fisheries protection vessel to Sierra Leone in 2012, together with advice to their Fisheries Officers and a satellite monitoring system for the local fishing fleet. This has contributed to an estimated 35% increase in local fish landings, adding $16m in annual earnings for subsistence fishermen.

2. **Overseas aid from the Isle of Man**

The International Development Committee of the Council of Ministers has committed part of its budget for the next three years to ensure the continuation of the SCFMP. Organisers such as the World Bank and the International Monetary Fund have praised the Isle of Man for its vision and commitment to a project

which contributes to the development of participating nations through capacity building in government financial administration. This is of great value as it bolsters the Island's reputation as a responsible international business centre.

Programmes supported by the International Development Committee must seek to address the UN Sustainable Development Goals.

16.4 Internal and external communication channels and media used by the biosphere reserve:

16.4.1 Is (will) there (be) a biosphere reserve website? If yes, what is its URL?

There are two – one as a Government webpage to direct to the external website:

http://www.gov.im/about-the-government/departments/environment,-food-and-agriculture/biosphere-vannin/

www.biosphere.im

16.4.2 Is (will) there (be) an electronic newsletter? If yes, how often will it be published?

There is currently no electronic newsletter. Consideration will be given to this when formulating the Biosphere Management Plan.

16.4.3 Does (will) the biosphere reserve belong to a social network (Facebook, Twitter, etc.)?

Yes, both Twitter and Facebook are used regularly

1) Twitter - @BiosphereIOM

https://twitter.com/BiosphereIOM

2) Facebook –Biosphere Isle of Man

https://www.facebook.com/biosphereIsleofMan

Use of terms for communication within the Isle of Man

For the purpose of communication within the island, the Biosphere Isle of Man Working Group have chosen to use the following terms.

Core areas: areas with statutory nature conservation protection status.

Buffer zones: Care Area, as the land is covered by many management codes which together add up to maintaining land in Good Agricultural and Environmental Condition, often through the Agricultural Development Scheme and a voluntary Code of Practice for landowners. This is also consistent with the German language translation of "Pflege" meaning "Care" zone. In the marine environment, the 0-3 nautical mile area outside of managed bays is regarded as Care Zone due to the robust Isle of Man Sea Fisheries Bye-laws, which are entirely controlled by the Isle of Man, see section 15.3 for further details.

Transition areas: Sustainable Development Area, comprising urban areas, housing and the outer Territorial Seas beyond 3 nautical miles, where fisheries management is by consultation with neighbouring jurisdictions. According to the Statutory Framework, the "transition zone" is "where sustainable resource management practices are promoted and developed". The Seville Strategy gave increased emphasis to the transition area since this is the area where the key issues on environment and development of a given region are to be addressed. The Isle of Man Strategic Plan (land use planning) has primacy over land use and land use changes, and is itself titled "towards a Sustainable island". Marine Consenting and marine usage is covered by virtue of consenting.

Communication has also been made more straightforward through the website and social media platforms. The website has downloadable information, for example Project Overview, Biosphere Isle of Man Pledge, Frequently Asked Questions, and Partner Guidelines (for Businesses and Non-Governmental Organisations), Voluntary Code of Practice for Landowners in the Buffer Area (referred to locally as Care Area), Zonation Guidance for appropriate uses per zone.

17. GOVERNANCE, BIOSPHERE RESERVE MANAGEMENT AND COORDINATION:

[Describe the following characteristics in the prospective that the site is being designated.]

17.1 Management and coordination structure:

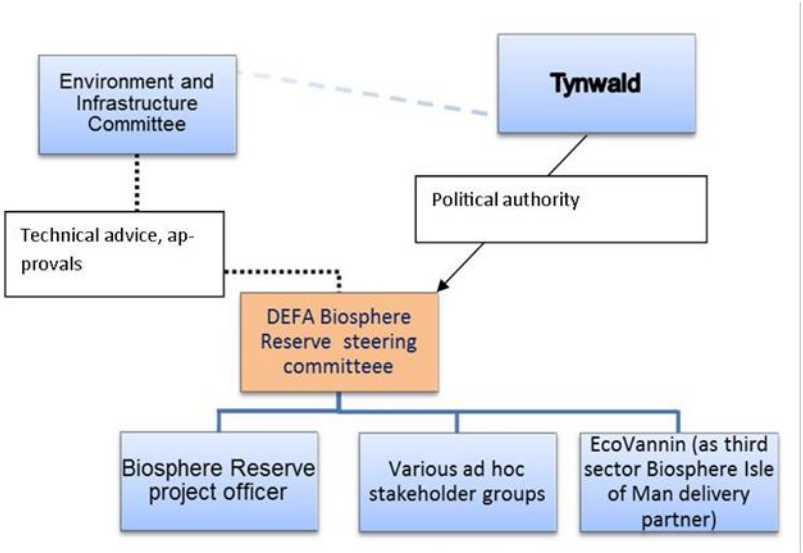


Figure 20: Organisational Structure of Biosphere Isle of Man

List of organisations in UNESCO Biosphere Isle of Man Steering Group, (presented alphabetically)

Department of Environment Food and Agriculture (DEFA) Lead organisation)

Centre for Manx Studies (CMS)
Children's Centre
Culture Vannin (formerly Manx Heritage Foundation)
Department of Economic Development (DED)
Department of Education and Children (DEC)
Department of Infrastructure
EcoVannin (third sector partner)
Institute of Directors representative
Manx Fish Producers Organisation
Manx National Farmers Union
Manx National Heritage (MNH)
Manx Wildlife Trust (MWT)

Tynwald consists of 2 houses House of Keys and Legislative Council

Environment and Infrastructure Committee is made up of ministers from DEFA, Department of Infrastructure and DED.

17.1.1 What is the legal status of the biosphere reserve?

The biosphere reserve does not have separate legal status neither is it intended that it will necessary to have such status, as a Government-Civil Society co-operative venture.

17.1.2 What is the legal status of the core area(s) and the buffer zone(s)?

These have the legal status of the existing statutory designation (in the case of the Core areas) or ownership by Government in the case of upland, glens and plantations included as Buffer.

Designation Documents for terrestrial and marine protected areas, along with Statutory Powers can be found in Appendix 1

17.1.3 Which administrative authorities have competence for each zone of the biosphere reserve (core area(s), buffer zone(s), transition area(s))?

All zones

The Department of Infrastructure

The Department of Infrastructure has responsibility for the terrestrial and marine planning systems and is therefore charged with preparing all necessary legislation and development plans, as well as assessing any applications for development.

With regard to the marine environment, this Department owns the sea bed and consents many of the activities which take place at sea (e.g. offshore wind, safeguarding navigation routes, hydrocarbons, and receiver of wrecks).

Core areas

Many of the core area designations are under the Authority of the **Department of Environment Food and Agriculture** whose legislation is enacted. Where the land is in **Manx National Heritage** ownership, that organisation is the administrative authority. The seabed up to mean high water mark is owned by the **Department of Infrastructure**[4] and some areas are leased to **Manx Fish Producers Organisation**.

Buffer zones and Transition areas

Department of Environment, Food and Infrastructure (DEFA) is the authority managing sustainable farming, fisheries and forestry within the buffer zones and transitional areas.

Department of Education and Children (DEC) is the educational authority for all the island's schools which are mainly in the transition area, although some schools are in small villages, i.e. in the buffer zone.

[4] However, the property in —

(a) all minerals existing in natural condition;

(b) all mines for the working of such minerals; and

(c) all petroleum existing in natural condition;

on, in or under the sea bed beneath the territorial sea is vested in the Department of Economic Development.

Department of Economic Development (DED) is responsible for encouraging sustainable economic development both on land and in the sea. It owns the mineral rights in both.

17.1.4. Clarify the respective competence of each of these authorities. Make a distinction between each zone if necessary and mention any decentralized authority.

Department of Environment Food and Agriculture (DEFA)
DEFA is the Government's department responsible for conservation, use and management of biodiversity. Its responsibilities are set out in the Wildlife Act 1990 and related Acts dealing with natural resources. DEFA's role is to work with businesses, stakeholders and government partners under the guidance of the Council of Ministers and their Environment and Infrastructure Committee (policy sub-committee), in the following areas:

- Sustainable management of the natural environment and biodiversity.
- Increasing energy independence.
- Reducing the effects of climate change.
- Ensuring there are thriving food businesses and food security.
- Growing the economy while safeguarding our natural resources.
- Protecting our health and promoting active enjoyment of the Isle of Man.
- Protecting the health and safety of those at work.

The Department has a significant role supporting three of the eight key themes identified in the Isle of Man Government's Vision 2020:

Destination Island (Tourism): *The Isle of Man offers high quality and unique experiences for visitors and residents within a stunning and globally significant landscape. A place where distinctive local character is maintained and celebrated. The Island has a reputation for outdoor adventure, heritage and culture with a year-round programme of events, headlined by the world-renowned TT races"*
Distinctive local food and drink (Retail and Produce):*Flourishing businesses reliably supply locally-produced staple and artisanal products, profitably exporting and contributing to a local food culture celebrated and valued by residents, visitors, retailers and the hospitality sector.*
Offshore energy hub (Harnessing the future waves of power): *The Isle of Man can be a viable hub for offshore energy, creating diverse jobs ranging from working on offshore energy platforms, to financial and professional services*.

The Department has the statutory responsibility to protect the Island and maritime environment from damaging human activity, whilst facilitating important and desirable development in a balanced way. Its aim is to ensure future generations are able to enjoy the same high quality environment, thriving economy and vibrant community as are enjoyed today.

Manx National Heritage
Manx National Heritage (MNH) is the public name of the Manx Museum and National Trust. This is the Isle of Man Government's statutory agency for cultural and natural heritage. Its responsibilities are set out in Manx Museum and National

Trust Act. In pursuit of these aims, MNH owns and manages buildings and land of national importance for nature conservation, landscape and historic interest, and for public benefit, which includes architectural and archaeological interests. In all these areas, its key objectives are preservation, conservation and, where these are not compromised, public access and enjoyment. As a means of ensuring these interests are preserved, MNH has enforceable duties with regard to the "natural aspect" of lands and is able to create its own Bye-Laws to add further protection. MNH is also able to declare land and buildings in its ownership as inalienable. MNH operates the Manx National Heritage Record which includes the Island's Biological Records Centre, on which MNH and DEFA base their conservation policies. MNH also operates the National Monuments Record (NMR), which provides cultural information about the landscape, on a similar basis. Currently its jurisdiction does not extend to the sea.

Department of Infrastructure
The Department of Infrastructure provides a diverse range of services including highways maintenance and improvement works, planning and building control, waste management, air and sea port facilities, properties and asset management, road safety, coastguard search and rescue, the provision of quarries and raw materials to support infrastructure development and the construction industry. The Department also has responsibility for engagement with local authorities.

Local authorities: Commissioners

There are 24 local authorities on the Isle of Man: 4 town authorities, 2 district authorities, 3 village authorities, and 15 parish authorities. One of the main functions of a local authority is to ensure that they provide the required services to their ratepayers, and in order to assist them in doing this, local authorities are required to set a rate for their district. The Island's local authorities also undertake a range of other functions, as set out below, although these vary according to the size of the authority:

- Public information and advice
- Tourism
- Refuse collection
- Street-lighting
- Public conveniences
- Parks, playgrounds and other leisure facilities
- Control of dogs
- Housing
- Car parking
- Street cleaning
- Building control (only in Douglas and Onchan)
- Libraries
- Trees and high hedges

- Abandoned vehicles
- Preservation of War Memorials and cemeteries

Other government departments own and manage land such as Department of Home Affairs (prison), Department of Education and Children (schools) Department of Health (hospitals) and Department of Economic Development (industrial estates).

17.1.5 Indicate the main land tenure (ownership) for each zone.

All minerals are owned by Department of Economic Development.

Table 29: Land Tenure
core ownership, buffer (mainly private but some govt) and transition (mainly private with a little govt.)
Note a small proportion of land has never been registered with IOM Land Registry if passed down within a family, in which case no formal areas and records exist.
Core area(s): Land

Organisation	**Land owned (ha)**
Government – DEFA	1450
Government – DOI	648 (inc inter-tidal)
Government – MNH	380
Manx Wildlife Trust	200
Private farmers and land owners	330
TOTAL	**3008**

Table 30: Core area: Marine

Organisation	**Marine area owned (ha)**
Government – DOI	12,390 ha including some areas managed by Fishermen's Groups

Buffer zone(s): Land is buffer (mainly private but some govt)
Government ownership of buffer zone land is primarily in the uplands with over 15,000 ha (30% of Buffer Zone), owned by DEFA and MUA and then leased out for farming) which has "public ramblage" in terms of public access, which covers majority of uplands and plantations. The remainder of land is in private ownership

Table 31: Marine Buffer Tenure. This is all government owned.

Organisation	**Marine area owned (ha)**
Government – DOI	68,107

Transition area(s): Land transition (mainly private with a little govt.)
>95% of land in transition areas are in private ownership, government owning less than 200 ha <5%.
Transition: Marine mainly govt with small areas potentially leased out.

Table 32: Transition: Marine tenure.

Organisation	Marine area owned (ha)
Government - DOI	319,303

17.1.6 Is there a single manager/coordinator of the biosphere reserve or are several people in charge of managing it? If one manager/coordinator, who designates and employs him/her (national authorities, environmental administrative agency, local authorities)?

A Biosphere Project Officer is presently employed by DEFA as the lead officer in the arm of Government facilitating this project. This does not mean, however, that this individual or organisation will necessarily lead every aspect of the governance and management of the biosphere reserve, given its diverse nature, although they will function as a central point of awareness, information, networking and co-ordination as needed. The project officer is responsible to the Steering committee in DEFA and the Biosphere Reserve Partnership.

There may also be a role for EcoVannin, dependent on the Thematic Groups, as they develop.

17.1.7 Are there consultative advisory or decision-making bodies (e.g., scientific council, general assembly of inhabitants of the reserve) for each zone or for the whole biosphere reserve?

If yes, describe their composition, role and competence, and the frequency of their meetings.

Tynwald is the democratically elected decision making political body for the Isle of Man as a whole, and to whom progress is ultimately reported. Tynwald approved the decision to pursue biosphere reserve status, and is ultimately responsible for ensuring that the biosphere reserve functions as set out in this nomination.

For the whole reserve

UNESCO Biosphere Steering Group
Composition:
Chair: UNESCO Biosphere Isle of Man Project officer, Department of Environment Food and Agriculture,

Biodiversity Officer Lead:

Manx National Heritage Representative:

Department of Economic Development Representative:

Department of Education and Children Representative:

Commercial Sector Representatives:

Institute of Directors
Manx National Farmers Union
Manx Fish Producers Organisation

Non-Government Organisation Representatives:

Manx Wildlife Trust
Friends of the Earth, Isle of Man
Isle of Man Children's Centre
Centre for Manx Studies
Culture Vannin

Role: decision-making body for delivery of objectives

Advisory body on conservation: Wildlife Committee – the statutory biodiversity committee advises DEFA on Wildlife Act and Trade in Endangered Species Issues.
Composition: Directors of DEFA (agriculture, fisheries and forestry), Curator of Natural History MNH, Manx Birdlife Manager, retired lecturer from Port Erin Marine Lab. Freshwater Biologist DEFA, biodiversity officers of DEFA. Others co-opted as necessary.
Role: scientific advisory committee.
Competence: scientific knowledge of local ecology and land uses.
Frequency of meetings: as required (2-3 times a year)

Consultative body on conservation: Nature Conservation Forum
Composition: representatives of all conservation and countryside and marine NGOs and producer groups chaired by DEFA Minister.
Role: to disseminate DEFA information and consultations to their members and to bring their members queries and concerns to DEFA
Competence: knowledge of countryside management and specific biodiversity groups and ecosystems
Frequency of meetings: every 3 months.

17.1.8 Has a coordination structure been established specifically for the biosphere reserve?

If yes, describe in detail its functioning, composition and the relative proportion of each group in this structure, its role and competence.

Is this coordination structure autonomous or is it under the authority of local or central government, or of the manager/coordinator of the biosphere reserve?

The Steering Group was established for the purpose of preparing the nomination form, but acts as a co-ordination body, as can be seen by its contributors and the stakeholders they represent. Terms of reference have been agreed *(Appendix 2)* that set out the governance structure, roles and desired balanced composition of the Group, and its reporting structure in these initial stages.

Once nomination papers are submitted, within an overarching plan for the biosphere reserve as a whole, efforts will focus on developing management plans for the constituent parts of the biosphere reserve, and how work programmes already underway can add value to it.

17.1.9 How is the management/coordination adapted to the local situation?

The Isle of Man's situation is different from many biosphere reserves. It is a Crown Dependency with its own laws and parliament, Tynwald. The Isle of Man is not part of the UK or the European Union. This has led to a very different democratic and legislative structure. The entire parliamentary body (35 members) endorsed the proposal to proceed with the nomination of the biosphere reserve in May 2013 before it the process began, thus giving it democratic approval. It agreed to put forward the entire jurisdiction area.

Consequently, the project will be engaging with individuals as well as representatives of organizations. The stakeholder engagement and nomination process started in June 2012 when an MSc student interviewed a wide range of stakeholders as well as members of the public. This was an ideal opportunity to assess levels of interest in the concept and its acceptability for the whole island. The key findings from this report were that awareness of UNESCO Biosphere Reserves was low, although once explained 93% were in support of the Isle of Man seeking nomination as a Biosphere Reserve.

Following the endorsement of Tynwald, a Project Overview document with aims, objectives, deliverables and scope was developed and agreed. A formal presentation was made by Prof .Peter Bridgewater, a former Secretary of UNESCO's Man and the Biosphere Programme and Director of its Division of Ecological Sciences 1999-2003, and resident of the Isle of Man, at the annual lecture of the Isle of Man United Nations Association to an audience of over 150 in October 2013, where positive feedback was received. Similar feedback was received from the Institute of Directors.

A photographic competition was held in October and November 2013 which brought the project to a wider public audience. Over 250 entries were received and the shortlisted entries were displayed. This exhibition was visited by nearly 1,000 visitors, with many people leaving contact details for further involvement. A Biosphere Pledge was developed, adapted from biosphere reserves in the UK and Canada, and which has been popular with stakeholders. Royal Bank of Scotland International (which includes Isle of Man Bank) with over 300 staff was the first business to sign the Pledge. It is viewed as complementary to their Corporate Social Responsibility programme. Eight schools have signed the Pledge, with a school population of over 3000 pupils. These are separate from the Department of Education and Children as an entire Department being a major partner in the project with over 12,000 pupils between ages of 5 and 18.

In June 2014, a stakeholder meeting was held to discuss and formulate zones, with a broad range of invited stakeholders and facilitated workshop format led by Dialogue Matters. This innovative process created an interactive open discussion which engendered more consensus than traditional consultation events. This led to many positive and constructive suggestions on zonation and volunteers for future involvement. It is likely that facilitated workshops will be used again, as it was such a productive and positive process.

17.1.10 Is there a procedure for evaluating and monitoring the effectiveness of the management?

The management plan will be developed after the nomination form is submitted.

17.2 Conflicts within the biosphere reserve

17.2.1 Describe any important conflicts regarding the access or the use of natural resources in the area considered (and precise period if accurate). If the biosphere reserve has contributed to preventing or resolving some of these conflicts, explain what has been resolved or prevented, and how this was achieved for each zone.

Sea

Shoreline

The shoreline of the island is very diverse and includes beaches, rocky cliffs, sandy slopes and dunes. Increasing recreational use by walkers with dogs, "coasteering", climbing, kayaking, camping and motorcycle scrambling means that most of the coast is subjected to disturbance. Impacts from such disturbances will be monitored, and actions taken if activities conflict with key biosphere reserve objectives.

Coastal waters

A meeting was held in Port St Mary in September 2012 to discuss how to resolve the conflict occurring between scallop dredgers, crab and lobster potters, divers and conservationists. In November 2012, the Baie ny Carricky management area was created, with a new byelaw prohibiting the use of mobile fishing gear in the designated area, and the taking of scallops by any method. Dredging for scallops has the potential to damage to biogenic reef ecosystems such as horse mussel reefs and Ross corals. Various measures are in place to reduce these conflicts.

Offshore tidal and wind power developments are planned for Manx waters and these require EIAs to be done and mitigation, avoidance and other strategies for minimising damage to be implemented.

Marine mammals, such as porpoises, dolphins and seals, and basking sharks are vulnerable to damage and disturbance by motor vessels. Publicising codes of good practice has helped reduce these conflicts.

Land

Uplands

Traditionally, the uplands have been quite heavily grazed by sheep. Small numbers of enthusiastic grouse shooters have managed some areas for grouse, and the hills attracted people who enjoyed quiet recreational activities. The use of

the hills by increasing numbers of motorised vehicles, 4x4s and motorbikes has led to conflicts, mainly related to damage to the tracks and paths.

Government's new conifer plantations on the uplands were not popular with the grouse shooters as they fragmented the open ecosystem. This new planting has ceased.

Watercourses

Particular efforts have been made to change from hard engineering solutions to more sympathetic green engineering solutions to watercourse management. Demonstration projects have been completed. Other measures have been taken to restore trout and salmon rivers, such as weir restoration and removal of obstructions. Pollution by farm effluents continues to be a problem, especially during the silage cutting season. Recent efforts to grant aid slurry tanks and improve slurry and manure management are starting to show positive results.

Facilitated workshops with stakeholders held in connection with the marine nature reserve and biosphere reserve have shown the potential of such fora to improve understanding and come up with pragmatic, workable solutions. It is too early to say how the biosphere reserve will mitigate conflicts, but early indications are positive.

17.2.2 If there are any conflicts in competence among the different administrative authorities in the management of the biosphere reserve, describe these.

The competence of different administrative bodies in the Isle of Man has been described in detail in section 17.1.3/4 above. There are no overt or intractable conflicts between bodies here, rather a few areas that require careful navigation and development of relationships – especially where new structures have been created. These include a consensus for changes to fisheries management in Manx Territorial Waters. Marine planning in Manx Territorial Waters is a recent issue and the integration of marine planning and conservation management functions may create issues between the government departments involved.

There is some overlap in natural heritage roles of MNH and DEFA, however they work together well. DEFA has the statutory duties in relation to biodiversity.

17.2.3 Explain the means used to resolve these conflicts, and their effectiveness.

Traditionally, individuals affected by conflicts have been able to bring their grievance in a "Petition of Redress of Grievance" to the annual outdoor Tynwald sitting in July. If the grievance is picked up by a member of the Tynwald, a select

committee chaired by the Political Member than picked up the topic will hear the various points of view and evidence.

In the marine environment, the use of facilitated workshops where dialogue and understanding is encouraged is working well. This is how agreement has been reached on the Marine Nature Reserve in Ramsey Bay.

In the countryside, the Isle of Man Farming and Wildlife Advisory Group of farmers and conservationists was established to bring together the different interests and demonstrate best practice by looking at examples of solutions on member's farms, as well as annual competitions organised through the Manx National Farmers Union.

17.3 Representation, participation and consultation of local communities:

17.3.1 At what stages in the existence of a biosphere reserve have local people been involved: design of the biosphere reserve, drawing up of the management/cooperation plan, implementation of the plan, day to day management of the biosphere reserve? Give some specific examples.

Biosphere Isle of Man is at an early stage. Local people have been

- Informed by publicity material,
- Spoken to in a wide range of meetings,
- Invited to a major meeting in the Manx Museum.

A wide range of stakeholders were invited to a facilitated workshop in June 2014 to assist in the zonation (full report in Appendix 3). Their views have been carefully recorded and ideas are being used to inform the next stages of the project.

The 'Biosphere Buddies' supporters group has been established via a webpage and anyone expressing an interest is invited to be involved further.

Local people will play a valuable role in future implementation and management measures, for example as volunteers on local practical improvement works such as involvement in the exciting projects of various NGO partners such as the Manx Wildlife Trust Ramsey Forest project, or participation in local environmental surveys with support from partners' staff and local experts.

17.3.2 Describe how the local people (including women and indigenous communities) have been, and/or are represented in the planning and management of the biosphere reserve (e.g., assembly of representatives, consultative groups).

See 17.1.8 and 9 and in particular use of Facilitated Workshops

17.3.3 Describe the specific situation of young people in the proposed biosphere reserve (e.g., potential impacts of the biosphere reserve on youth, consideration of their interests and needs, incentives to encourage them to participate actively in the governance system of the biosphere reserve).

Young people have consciously been considered, and included where possible from the outset. The original Steering Group members included the Department of Education and Children, as well as the Children's Centre. Scout Commissioners were also invited to the Stakeholder Zonation meeting, to ensure a youth perspective was included.

DEC Youth Service provides young people with places to go, things to do and people to talk to. A Youth Forum for the biosphere reserve could be considered.

17.3.4 What form does this representation take (e.g., companies, associations, environmental associations, trade unions)?

Access to Working Group members is open to all, and is welcome. A very wide cross section of the community was invited to the first stakeholder event and their opinions sought and noted.

As described under section 17.1.8 and 17.1.9 above, there are a number of different NGO, voluntary and community bodies represented on our Steering Group.

17.3.5 Are there procedures for integrating the representative body of local communities (e.g., financial, election of representatives, traditional authorities)?

As described above, the Steering Group reports information and progress to the Environment and Infrastructure Committee and liaises closely with other Committees and officers working on social programmes such as linking in with the Third Sector Forum, local authorities, the wider voluntary sector, and the business community.

17.3.6 How long-lived are consultation mechanisms (permanent assembly, consultation on specific projects)? Make a complete description of this consultation. What are the roles of involved stakeholders compared to the role of the biosphere reserve?

See 17.1.9. The development of management plan for the operation of the proposed Biosphere Reserve is to take place once the nomination papers are submitted.

17.3.7 What consultation mechanisms have been used, and who has been involved? Are they for specific purposes or long-term? What impacts have they had on decision-making processes *(decisional, consultative or merely to inform the population)?*

Tynwald voted as a whole in May 2013 to take forward nomination of the entire Isle of Man as a Biosphere Reserve. On 24th October 2013 at a very well attended meeting of the United Nations Association of the Isle of Man, Professor Peter Bridgewater spoke about the potential benefits of making the island a Biosphere Reserve.

Banners and communication materials were displayed at Agricultural shows in 2014 and many further stakeholder meetings and events.

See 17.3.1 and 17.1.9. The development of a management plan for the proposed Biosphere Reserve will occur once the nomination papers are accepted. Given the wide, representative range of stakeholders engaged in the consultation process a strong consensus of the proposed zonation is assured.

17.3.8 Do women participate in community organizations and decision-making processes? Are their interests and needs given equal consideration? What incentives or programmes are in place to encourage their representation and participation *(e.g.: was (were) a "gender impact assessment(s)" carried out)?*

No gender impact has been carried out. It is relevant to note the Isle of Man has the world's longest continuous parliamentary assembly, Tynwald, since AD 979 at over 1000 years, originating in the Viking era. The Isle of Man was amongst the first countries to give women the vote in national elections, in 1881. The UK made the same suffrage changes in 1918. Women have traditional leading roles in rural affairs, which is expected to translate into continued support for the biosphere reserve.

The most recent innovation in the decision making process has been to lower the age of voting at national (and local elections) to 16, from 18, which took place in July 2006.

17.4. The management/cooperation plan/policy

17.4.1 Is there a management/cooperation plan/policy for the biosphere reserve as a whole?

As mentioned in Part 4.7b a proposed management plan will cover the entire biosphere reserve. The plan is intended to facilitate and support relevant initiatives of bodies in the partnership, other groups and businesses, helping them to connect with existing delivery programmes wherever possible. The plan will be developed following nomination paper submission and acceptance, and will elaborate how the Biosphere Isle of Man concept can support the continuation of a "vibrant community, healthy environment, and thriving economy".

17.4.2 Which actors are involved in preparing the management/cooperation plan? How are they involved?

The main authors of the plan are likely to be comprised of the Steering Group members, with input from various parties in their areas of expertise for their respective Thematic Groups, for example Marine Biodiversity Officers and Manx Fish Producers Organisation for marine topics. This draft plan would then be consulted on using standard procedures for key policies.

17.4.3 Do local authorities formally adopt the management/cooperation plan? Are local authorities making reference to it in other policies and/or plans? If so, please provide details.

The Isle of Man Government and its Strategic Plan 2007 covers the entire jurisdiction. The main partners include the Department of Infrastructure (responsible for Strategic Plan and land use policy, as well as being the technical owner of the territorial waters, rather than the UK Crown Estate), the Department of Environment, Food and Agriculture (responsible for managing agricultural and marine management policy as well as owning more than 19% of the land surface and responsible for setting and monitoring management plans for ASSI sites), the Department of Education and Children (responsible for all state schools and education policy), Manx National Heritage (responsible for large land holdings as well as several museums, cultural archives and records) and Manx Wildlife Trust (the largest nature conservation charity on the island and owner of over 20 nature reserves). As representatives of all these bodies and the Chief Minister have formally signed this nomination, there is formal commitment to developing and adopting a management plan and regime for the Biosphere reserve, using existing statutory and administrative instruments.

17.4.4 What is the duration of the management/cooperation plan? How often is it revised or renegotiated?

The management plan would run for 5 years from autumn 2016. During this time it will be monitored, adapted if necessary, and then completely reviewed and revised by early 2020.

17.4.5 Describe the contents of the management/cooperation plan. Does it consist of detailed measures or detailed guidelines? Give some examples of measures or guidelines advocated by the plan? *(Enclose a copy).*

The Biosphere Management Plan will be prepared following nomination paper submission.

The metrics for the medium to long term management plan will be a refinement of the following Performance Indicators:

Table 33: Performance Metrics for UBIOM

Dimensions	*Criteria/potential benefit*	*Identified benefit*
A healthy environment		
Biodiversity	species diversity, range and abundance	Contribution to management of core and buffer areas. Volunteer engagement and management. Greater awareness.
	habitat extent and condition	"
	structural diversity and connectivity	"
Landscape	character, condition and qualities	"
Ecosystem services	quality and productivity of soil, water, air	"
	carbon sinks	", link to Uplands Strategy
	other ecosystem services	", land and marine
Other	any other environmental impacts	# of participants in events and excursions

Dimensions	*Criteria/potential benefit*	*Identified benefit*
A vibrant society		
Recreation and access	active recreation	Management of lands and routes, e.g. uplands, green lanes, glens/plantations, footpaths. Volunteer programme
	Access	"
	passive recreation and inspiration	Website, publicity in tourist and inward Where You Can literature. Links to historic and cultural events, tourism events
Understanding and awareness	understanding and awareness	Eco-school projects, public involvement in cultural and community activities. Greater understanding through use of UBIOM Pledge, Project Overview and communication materials
Community	engagement of UBIOM *with* community	Links with DEFA, DED, DEC and community partners
	involvement *of* community with UBIOM	Eco-schools activity and use of IOM specific data – Citizen Science

	vitality and cohesion	Sense of pride in place and shared value; agreed vision
The quality of places to live	near environment (greenspace)	Footpath usage, public park quality
	houses and gardens	To do, some good examples
Education/Learning	Research	# of research projects ranging from abiotic, biotic and socio-cultural research at U/G, P/G and PhD levels
Education/Learning	Participants in public/partner events	School visits, business training, Educational sessions pa – Eco-schools, FWAG, MNH, MWT, other partners
Education/Learning	Education/Learning	# of participants, education events
Other	*any other social impacts*	

Dimensions	***Criteria/potential benefit***	***Identified benefit***
A Thriving Economy		
Employment and income	direct employment and income	Diverse economic activity figures, as measured by annual digest of economic statistics
	indirect employment and income	"
	job quality	"
Business/Development	business opportunities and constraints	Branding associated with UBIOM status?
	enhancing marketing opportunities	"
	long term investment	Anticipated as a result of enhanced image and profile of IOM as a jurisdiction
	human resources	Ability to attract inward investment and business relocation
Resource use	conservation of resources with tangible and potential economic value	Appropriate management of natural resources
Economic activity	CO2 emissions vs Economic activity	Continued decoupling of economic activity (GNP) vs CO2

		emissions/per capita emissions
	Number of businesses with Environmental Management Systems e.g. ISO 14001 and/or active Corporate Social Responsibility Programmes	Environmental improvement works within businesses
Publicity	Media Articles	No of media articles in newspapers, journals and other media, total outreach figure

17.4.6 Indicate how this management/cooperation addresses the objectives of the proposed biosphere reserve (as described in section 13.1).

The three Biosphere objectives of 1) nature (and cultural conservation);
2) sustainable socio-economic development;
3) logistic support;

will be covered in the planned management/co-operation plan, as shown by the performance indicators listed in Section 17.4.5.

17.4.7 Is the plan binding? Is it based on a consensus?
The management plan will not be considered as binding in a strict legal sense. However, it is being/will be signed up to by all Biosphere partners including through formal decision-making procedures (e.g. Ministers and Chief Executives of Government Departments and Directors or Chief Executives of Businesses and NGO partners). Hence the strategy is based upon a consensus across our Partnership (and to some extent beyond this) and partners are committed to it to the extent possible without it being a statutory document or process itself. Some parts of the strategy would be directly derived from existing statutory policies and would thus be binding in their own right.

17.4.8 Which authorities are in charge of the implementation of the plan, especially in the buffer zone(s) and the transition area(s)? Please provide evidence of the role of these authorities.

The Government's Department of Environment Food and Agriculture has overall responsibility and is leading on this.

Implementation in the terrestrial buffer and transition zones will be dependent on land ownership, but exist using statutory and administrative instruments allow for effective implementation under the guidance of the Council of Ministers, with cooperation for private landholders as relevant/necessary.

Implementation of our prospective strategy in the marine areas will generally be led by DEFA in partnership with the Department of Infrastructure (seabed owners) and Manx Fish Producers Organisation.

17.4.9 Which factors impede or help its implementation (e.g.: reluctance of local people, conflicts between different levels of decision-making).

The key consideration is the extent to which the biosphere reserve initiative is known about, including the relevance of the zones, the principles of sustainability and biodiversity conservation, and the management plan. The initiative needs to be assimilated into projects by local partner organisations, and by individuals as something that they actively wish to use to further their agendas and our common objectives. The first challenge is one of communicating the concept.

The second challenge is finance. Government is currently striving to balance the Island's budget and a dedicated fund for the biosphere reserve is not currently available, outside of normal departmental outlays, all of which contribute to the effective management of the Island as a biosphere reserve.

Implementation will be assisted by the social cohesiveness of the Island and its various local communities, their pride in the island and its wildlife and culture.

17.4.10 Is the biosphere reserve integrated in regional/national strategies? Vice versa, how are the local/municipal plans integrated in the planning of the biosphere reserve?

In the regional context, the proposed biosphere reserve will be linked to the UK national network of Biosphere Reserves under the UK MAB Committee, and efforts made to link with the biosphere reserve activities of the Republic of Ireland. Communication is already rich with Dyfi and Galloway and South Ayrshire Biosphere Reserves. The Project Officer is investigating the scope for combining research efforts with academic partners at the Solway Centre in Galloway and Southern Ayrshire biosphere reserve.

This nomination was supported in May 2013 by Tynwald and is a government priority. This high profile should ensure that all parts of government are aware of the initiative. The prospective biosphere reserve features, and is integrated, in several strategic policies of the Isle of Man Government and is complementary to many other concurrent work-streams.

17.4.11 Indicate the main source of the funding and the estimated yearly budget.

There is no dedicated ring-fenced budget for the Biosphere Isle of Man project, however, the value and merit has been self-evident with the support from Tynwald, and the range of supporting organisations willing to sign letters of endorsement and/or join the Steering Group. The fact that the project is explicitly mentioned as a strategic target for the Isle of Man Government gives confidence funding would be forthcoming, which may also be by virtue of benefits in kind,

sponsorship and non-cash contributions, which would also apply to EcoVannin as a third sector delivery partner.

17.5 Conclusions

17.5.1 In your opinion, what will ensure that both the functioning of the biosphere reserve and the structures in place will be satisfactory? Explain why and how, especially regarding the fulfilment of the three functions of biosphere reserves (conservation, development, logistic) and the participation of local communities.

The developing Biosphere Partnership for the proposed UNESCO Biosphere Isle of Man has demonstrated its flexibility and site-specific approach to zonation and stakeholder engagement from its earliest days. This started with pan-governmental (public sector) approval to progress with the project and then engaging with a range of civil sector organisations and businesses. The partnership extends across sectors that deal with all three objectives of biosphere reserves, and is working to develop a balanced representation including more private sector inclusion. This was particularly the case for business partners such as fishermen and farmers who were inspired by how biosphere reserves in Germany and Switzerland had used the UNESCO accolade as a means to emphasise how their produce and the management of their sites are of interest to customers. It has been particularly challenging approaching zonation and a nomination for an entire jurisdiction, but by understanding stakeholders' perspectives, innovative and pro-active suggestions were made. This also meant an unusually broad range of stakeholders were keen for the project to succeed, as they saw it had merit. This seems to also be well captured in the all Island Strategic Plan subtitled "Towards a Sustainable Island".

18. SPECIAL DESIGNATIONS:

[*Special designations recognize the importance of particular sites in carrying out the functions important in a biosphere reserve, such as conservation, monitoring, experimental research, and environmental education. These designations can help strengthen these functions where they exist or provide opportunities for developing them. Special designations may apply to an entire proposed biosphere reserve or to a site included within. They are therefore complementary and reinforcing of the designation as a biosphere reserve. Check each designation that applies to the proposed biosphere reserve and indicate its name]*

Internationally important sites:

- Name: **Ballaugh Curragh Ramsar Site**

(√) Ramsar Wetland Site

- Ballaugh Curragh

Ballaugh Curragh was designated as a good representative site for Curragh – Manx wetland, on peat. It has been an important hen harrier winter roost site. It is also important for conservation, monitoring and environmental education. [5]

2006 Ramsar information appended.

- Name: **Ramsey Bay Marine Nature Reserve**

(√) OSPAR Marine Protected Area

It covers maerl beds, horse mussel reef and seagrass beds. It is also important for conservation, monitoring, research and environmental education.

1. Name: **Dark Sky Discovery Sites**

26 Milky Way Class Dark Sky Discovery Sites have been identified on the Isle of Man, which has the largest concentration of Dark Skies sites in the British Isles. These are awarded by the UK Science and Technology Facilities Council and are given the status on the basis of being "accessible and free enough from light pollution to get a good view of the stars". At these sites, the Milky Way is visible to the naked eye. There is scope to investigate links with the UNESCO Starlight Initiative.

Nationally important sites

[5] *https://www.gov.im/categories/the-environment-and-greener-living/protected-sites/ballaugh-curragh/* and *http://www.ramsar.org/ballaugh-curragh*

2. Name**: The Calf Bird Observatory**

(√) Long-term monitoring (birds)

Since 1959, organised ornithological work has been carried out on the Calf of Man under the supervision of appointed wardens and in 1962 it became an officially recognised Observatory. This rocky islet of 616 acres is important for sea birds and migrants which are ringed. [6] The rat eradication programme has improved breeding conditions for Manx shearwaters from 76 occupied burrows in 2013 to 424 occupied burrows in 2014 (over 500% increase) although it is too early to say if the trend will continue.

3. Name**: Sea water monitoring series**

(√) Long term monitoring (surface sea temperature). Port Erin Breakwater (54 05.113(N), 04 46.083(W)) - Surface sea temperature monitoring. Daily measurements have been taken at a depth of 2.9m since 1 January 1904. Temperature was measured by means of certified mercury thermometers supplied by the UK Met Office until September 2006 when temperature autologgers were deployed in the vicinity of Port Erin Lifeboat slip.

The data comprise measurements of temperature at 0, 5, 10, 20 and 37m; salinity, dissolved oxygen, phosphate, nitrate, nitrite, silicate and ammonia at 0 and 37m; and chlorophyll-a at the surface. Total dissolved nitrogen was also measured at 0 and 37m, while total dissolved phosphorus was measured at 0 and 37m. Daily measurements have been taken since 1 January 1904. These are important for climate change monitoring and predictions.[7]

4. Name: **Douglas meteorological station**

(√) Long term monitoring (rainfall and air temperature)

Two long-term, continuous meteorological records extend back to 1870 for precipitation and to 1878 for air temperature in Douglas, and are monitored by the Isle of Man meteorological service. These data are used to assess if global trends are occurring at the regional scale of the Isle of Man.

[6] http://manxbirdlife.im/info/the-calf-of-man/

[7] http://data-search.nerc.ac.uk/search/full/catalogue/grid.bodc.nerc.ac.uk__NERC_DMS_0.7__EDMED4850.xml

19. SUPPORTING DOCUMENTS

(to be submitted with nomination form):

(1) Location and zonation map with coordinates

[Provide the biosphere reserve's standard geographical coordinates (all projected under WGS 84).
Provide a map on a topographic layer of the precise location and delimitation of the three zones of the biosphere reserve (Map(s) shall be provided in both paper and electronic copies). Shapefiles (also in WGS 84 projection system) used to produce the map must also be attached to the electronic copy of the form. If applicable, also provide a link to access this map on the internet (e.g. Google map, website).]

(2) Vegetation map or land cover map

[A vegetation map or land cover map showing the principal ecosystems and land cover types of the proposed biosphere reserve should be provided, if available].

Phase 1 ecosystem map

(3) List of legal documents *(if possible with English, French or Spanish synthesis of its contents and a translation of its most relevant provisions)*

[List the principal legal documents authorizing the establishment and governing use and management of the proposed biosphere reserve and any administrative area(s) they contain. Provide a copy of these documents.

Isle of Man Strategic Plan – Towards a Sustainable Island, adopted 2007, under the Town and Country Planning Act 1999. Land Use Planning Policy.
https://www.gov.im/media/189489/strategicplan_finalversion.pdf

Designation Documents for terrestrial and marine protected area, along with Statutory Powers can be found in Appendix 1

Core
Designation document - Ayres National Nature Reserve
Curraghs Ramsar Information Sheet
ASP – Point of Ayre gravel pit
Declarations of Areas of Special Scientific Interest

(4) List of land use and management/cooperation plans

[List existing land use and management/cooperation plans (with dates and reference numbers) for the administrative area(s) included within the proposed biosphere reserve. Provide a copy of these documents. It is recommended to produce English, French or Spanish synthesis of its contents and a translation of its most relevant provisions]

ASSIs and other sites under statutory conservation measures and ownership are subject to government management and protocols in place from time to time to ensure appropriate management is in operation.

Buffer
Manx Wildlife Trust has written reserve plans for:

Ballamooar Meadow
Barnell
Breagle/Cronk Aash
Close e Quayle
Close Sartfield (in Ballaugh Curragh ASSI and Ramsar site)
Close Umpson (in Ballaugh Curragh ASSI and Ramsar site)
Cooildarry
Cronk y Bing (ASSI)
Curragh Feeagh
Dalby Mountain
Dalby Mountain Fields
Earystane
Fell's Field
Onchan wetlands
Goshen (in Ballaugh Curragh ASSI and Ramsar site)
Glen Dhoo
Miss Guyler's Meadow
Moaney and Crawyn's meadows (in Ballaugh Curragh ASSI and Ramsar site)

These reserves have management plans which were updated and had an annual review at the start of 2014. These management plans are available on request rather than being appended. They are extensive working documents.

(5) Species list (to be annexed)

[Provide a list of important species occurring within the proposed biosphere reserve, including common names, wherever possible.]

TAXON GROUP	**Number of species recorded in the database****
acarine (Acari)	1
alga	123
amphibian	5
annelid	37
bacterium	1
bird	171

bony fish (Actinopterygii)	60
bryozoan	65
cartilagenous fish (Chondrichthyes)	3
centipede	20
chromist	81
clubmoss	5
coelenterate (=cnidarian)	64
comb jelly (Ctenophora)	3
conifer	34
crustacean	61
echinoderm	31
false scorpion (Pseudoscorpiones)	4
fern	45
flatworm (Turbellaria)	5
flowering plant	1156
foraminiferan	23
fungus	1233
harvestman (Opiliones)	9
hornwort	2
horsetail	7
insect - alderfly (Megaloptera)	1
insect - beetle (Coleoptera)	464
insect - booklouse (Psocoptera)	3
insect - bristletail (Archaeognatha)	3
insect - butterfly	45
insect - caddis fly (Trichoptera)	10
insect - dragonfly (Odonata)	17
insect - earwig (Dermaptera)	1
insect - flea (Siphonaptera)	2
insect - hymenopteran	120
insect - lacewing (Neuroptera)	8
insect - mayfly (Ephemeroptera)	11
insect - moth	486
insect - orthopteran	7
insect - stonefly (Plecoptera)	11
insect - true bug (Hemiptera)	80
insect - true fly (Diptera)	318
jawless fish (Agnatha)	1

lichen	436
liverwort	50
marine mammal	8
millipede	17
mollusc	187
moss	192
reptile	1
ribbon worm (Nemertinea)	3
slime mould	30
spider (Araneae)	130
sponge (Porifera)	53
springtail (Collembola)	1
stonewort	4
terrestrial mammal	8
tunicate (Urochordata)	27
TOTAL	**5984**

(6) List of main bibliographic references (to be annexed)
[Provide a list of the main publications and articles of relevance to the proposed biosphere reserve over the past 5-10 years].

Allen, D E (1984) **Flora of the Isle of Man**. Published by Manx Museum and National Trust.

Bates, M, Thompson, R, Veale, L (1998) **Isle of Man Sublittoral Survey 1994-97** Port Erin: Port Erin Marine Laboratory.

Brander, L and McEvoy, P (2012) **The economic value of ecosystem services from the terrestrial habitats of the Isle of Man**. Unpublished report for Isle of Man Government

Chiverrell, R and Thomas, G (2006) **A New History of the Isle of Man. Volume 1 The Evolution of the Natural Landscape.** Published by Liverpool University Press

Fullen, MA, Harris, J and Kear, BS (1996) **Soils of the Isle of Man**. Published by Centre for Manx Studies

Garrad, LS (1972) ***The Naturalist in the Isle of Man****. Published by David and Charles*

Gubbay, S (2000) **A Review of Sites of Marine Nature Conservation Importance around the Isle of Man** St John's: Manx Wildlife Trust,

Harris, J (2001) **Agricultural Soils of the Isle of Man.** Published by the Centre for Manx Studies

Holt, T.J. **An Intertidal survey of the Isle of Man 1996-99 (2000)** Report to the Manx Wildlife Trust St Johns: Manx Wildlife Trust

Kang, MJ (2012) ***Scoping Study of the Isle of Man as a potential UNESCO Biosphere Reserve (BR): Can BR designations improve the status of ecosystem services on the Island?*** *MSc Environmental Sustainability Dissertation, University of Edinburgh, School of Geosciences.*

Kinvig, RH (1975) ***The Isle of Man A Social, Cultural and Political History****. Published by Liverpool University Press.*

Isle of Man Government (2008) **Isle of Man Landscape Character Assessment** by Chris Blandford Associates https://www.gov.im/media/633635/iomlanscapecharacterassessment.pdf

Mead A, Beaumont N and Austin M (2014) **An approach to valuing the marine ecosystem services of the Isle of Man.** Plymouth Marine laboratory unpublished report for the Isle of Man Government

Sayle T, Lamb J, Colvin A and Harris B (1995) **Isle of Man Ecological Habitat Survey**. Published by Department of Agriculture, Fisheries and Forestry

Sharpe, C (2007) **Manx Bird Atlas.** Published by Liverpool University Press. Isle of Man A Sense of place

Wilson, G N., Johnson, H and Sallabank, J (2014). **'I'm not dead yet': a comparative study of indigenous language revitalization in the Isle of Man, Jersey and Guernsey.** Current Issues in Language Planning

(7) Original Endorsement letters according to paragraph 5

Please see Appendix 6a – Letters of Support
Appendix 6b – Formal Indications of Support by email
Appendix 6c – Formal Indications of Support by email, schools

(8) Further supporting documents.

Copy of landscape character assessment map

20. ADDRESSES:

20.1 Contact address of the proposed biosphere reserve:
[Government agency, organization, or other entity (entities) to serve as the main contact and to whom all correspondence within the World Network of Biosphere Reserves should be addressed.]

Name: **Department of Environment, Food and Agriculture (DEFA)**

Street or P.O. Box: **Thie Slieau Whallian, Foxdale Road**

City with postal code: **St John's, IM4 3AS**

Country: **Isle of Man - UK**

Telephone: 00 44 1624 685149

E-mail: peter.longworth@gov.im

Web site: www.biosphere.im

DEFA has major responsibility for core areas, and some of the Buffer zone. It remains the key government co-ordinating department for activities in all the zones, terrestrial and marine."

20.2. Administering entity of the core area(s):

Name:

Street or P.O. Box: _____

City with postal code: _____

Country: _____

Telephone: _____

E-mail: _____

Web site: _____

20.3. Administering entity of the buffer zone(s):

Name:

Street or P.O. Box: _____

City with postal code: _____

Country: _____

Telephone: _____

E-mail: _____

Web site: _____

20.4. Administering entity of the transition area(s):

Name:
Street or P.O. Box: _____
City with postal code: _____
Country: _____
Telephone: _____
E-mail: _____
Web site: _____

Common name	Scientific name	International significance (eg IUCN)	Protected on Isle of Man under Wildlife Act 1990	Status on Isle of Man	Mentioned in nomination paper text
Mammals					
Bottlenose dolphin	*Tursiops truncatus*	CMS, ASCOBANS	Schedule 5	Regular sightings	yes
Short beaked common dolphin	*Delphinus delphus*	CMS, ASCOBANS	Schedule 5	Regular sightings	yes
Grey seal	*Halichoerus grypus*	IUCN Least concern	Schedule 5	Good breeding population	yes
Leisler's bat	*Nyctalus leisleri*		Schedule 5	Regularly recorded	
Minke whale	*Balaenoptera acutorostrata*	CMS, ASCOBANS	Schedule 5	Regular sightings	yes
Risso's dolphin	*Grampus griseus*	CMS, ASCOBANS	Schedule 5	Regularly seen in summer.	yes
Stoat	*Mustela erminia*		Schedule 5	Occasionally recorded	
Harbour porpoise	*Phocoena phocoena*	CMS, ASCOBANS, OSPAR Threatened/declining species	Schedule 5	Most common cetacean, thought to be resident	yes
Orca	*Orcinus orca*	CMS, ASCOBANS	Schedule 5	Occasionally recorded	
Humpback whale	*Megaptera novaeangliae*	CMS, ASCOBANS, IUCN Least Concern	Schedule 5	Occasionally recorded	

Fin whale	*Balaenoptera physalus*	CMS ASCOBANS, IUCN Endangered	Schedule 5	Occasionally recorded	

Birds

Little tern	*Sternus albifrons*	Amber-list of Birds of Conservation Concern in the UK, Bonn EAWA Annex 2 species	Schedule 1	One breeding colony on the Ayres foreshore	
Osprey	*Pandion haliaetus*	Amber-list of Birds of Conservation Concern in the UK	Schedule 1	Regular passage migrant	
Corncrake	*Crex crex*	Red-list of Birds of Conservation Concern in the UK, Bonn EAWA Annex 2 species	Schedule 1	Recently ceased breeding as far as is known.	yes
Curlew	*Numenius arquata*	IUCN Near threatened, Amber-list of Birds of Conservation Concern in the UK, Bonn EAWA Annex 2 species	Schedule 1	Resident. Currently population is steady.	yes
Hen harrier	*Circus cyaneus*	Red-list of Birds of Conservation Concern in the UK CMS Raptor's MOU	Schedule 1	Population has declined recently but still 20+ pairs? Good numbers roost in winter.	yes
Lapwing	*Vanellus vanellus*	Red-list of Birds of Conservation Concern in the UK, Bonn EAWA Annex 2 species	Schedule 1	Population in decline	yes

Manx shearwater	*Puffinus puffinus*	Amber-list of Birds of Conservation Concern in the UK	Schedule 1	Small breeding population	yes
Peregrine	*Falco peregrinus*	Annex III of Bern Convention	Schedule 1	Healthy breeding population	yes
Red billed chough	*Pyrrhocorax pyrrhocorax*	Amber-list of Birds of Conservation Concern in the UK	Schedule 1	Healthy resident population	yes
Yellowhammer	*Emberiza citronella*	Red-list of Birds of Conservation Concern in the UK	Schedule 1	Very small and declining population	yes
Grasshopper warbler	*Locustella naevia*	Red-list of Birds of Conservation Concern in the UK	Schedule 1	Small stable population	
Skylark	*Alauda arvensis*	Red-list of Birds of Conservation Concern in the UK	Schedule 1	Small stable population, declining in lowlands	yes
Starling	*Sturnus vulgaris*	Red-list of Birds of Conservation Concern in the UK	Schedule 1	Healthy resident population	
House sparrow	*Passer domesticus*	Red-list of Birds of Conservation Concern in the UK	Schedule 1	Healthy resident population	
Tree sparrow	*Passer montanus*	Red-list of Birds of Conservation Concern in the UK	Schedule 1	Local small resident population	yes
Herring gull	*Larus argentatus*	Red-list of Birds of Conservation Concern in the UK		Healthy resident population	

Song thrush	*Turdus philomelos*	Red-list of Birds of Conservation Concern in the UK	Schedule 1	Healthy resident population	
Linnet	*Carduelis cannabina*	Red-list of Birds of Conservation Concern in the UK		Healthy resident population	yes
Redwing	*Turdus iliacus*	Red-list of Birds of Conservation Concern in the UK		Regular passage migrant	
Grey partridge	*Perdix perdix*	Red-list of Birds of Conservation Concern in the UK		Very small and declining population	yes

Fish

Atlantic cod	*Gadus morhua*	IUCN Red list Vulnerable, OSPAR Threatened/declining species		No longer common. Approx 1 tonne per year landed commercially	yes
Basking shark	*Cetorhinus maximus*	IUCN Vulnerable (globally) Endangered (NE Atlantic), OSPAR Threatened/declining species, Convention on Migratory Species MoU on Sharks species (IOM has signed up via UK)	Schedule 5	Regular visitor	yes
Brook lamprey	*Lampetra planeri*	IUCN Least concern		Occasionally seen	yes
Brown trout	*Salmo trutta*	IUCN Least concern		Common	yes

European eel	*Anguilla anguilla*	IUCN Critically endangered, OSPAR Threatened/declining species. CITES listed		Frequently found in some areas	yes
River lamprey	*Lampetra fluviatilis*	Only found in western Europe, IUCN Least concern		occasionally seen	yes
Salmon	*Salmo salma*	OSPAR Threatened/declining		Three main salmon rivers and found elsewhere. Annual monitoring in Manx rivers.	yes
Skates, rays and other sharks	*Elasmobranchs*	OSPAR listed		Occasionally recorded	yes
Common skate	*Dipterus batis*	OSPAR Threatened/declining		Occasionally recorded	
Spotted ray	*Raja montagui*	OSPAR Threatened/declining		Status unknown	
Porbeagle	*Lamna nasus*	OSPAR Threatened/declining		Occasionally recorded. No longer commercially targetted. Convention on Migratory Species MoU on Sharks species (IOM has signed up via UK)	yes

Thornback ray	*Raja clavata*	OSPAR Threatened/declining		Occasionally recorded. Occasionally caught as bycatch in queen scallop fishery.	
White skate	*Rostroraja alba*	OSPAR Threatened/declining		Occasionally recorded	
Northeast Atlantic Spurdog	*Squalus acanthias*	OSPAR Threatened/declining. Convention on Migratory Species MoU on Sharks species (IOM has signed up via UK)		No longer taken commercially. Small numbers recorded as bycatch in queen scallop fishery.	yes
Angel shark	*Squatina squatina*	OSPAR Threatened/declining		Status unknown	
Sea lamprey	*Petromyzon marinus*	OSPAR Threatened/declining		Occasionally recorded	
Allis shad	*Alosa alosa*	OSPAR Threatened/declining		Occasionally recorded	
Reptiles					
Leatherback turtle	*Dermochelys coriacea*	OSPAR Threatened/declining species	Schedule 5	Occasionally recorded	yes
plants					
Least willow	*Salix herbacea*		Schedule 7	One small population on Snaefell	yes

Elm species	*Ulmus glabra* and other spp and vars.			Healthy population largely unaffected by DED	yes
Isle of Man cabbage	*Coincya monensis ssp monensis*	Scarce *	Schedule 7	2-3 small populations in the north of island	yes
Killarney filmy fern	*Vandenboschia speciosa*	IUCN Red List - rare, GB Red Data Book - vulnerable	Schedule 7	One site in ASSI	yes
Pennyroyal	*Mentha pulegium*	Red data book species. Rare*	Schedule 7	Very few sites in North of island	yes
Scottish filmy fern	*Hymenophyllum wilsonii*	Red Data Book species Threatened	Schedule 7	One site in upland plantation	yes
Common Spotted orchid	*Dactylorhiza fuchsii*		Schedule 7		yes
Heath spotted orchid	*Dactylorhiza ericetorum*		Schedule 7		yes
Greater butterfly orchid	*Platanthera chlorantha*		Schedule 7		yes
Bee orchid	*Ophrys apifera*		Schedule 7	Two sites	yes
Pyramidal orchid	*Anacamptis pyramidalis*		Schedule 7	now only at the Ayres, not seen recently at Ronaldsway	yes
Northern marsh orchid	*Dactylorhiza purpurea*		Schedule 7		yes
Early purple orchid	*Orchis mascula*		Schedule 7	limited to the Ayres now.	yes
Early marsh orchid	*Dactylorhiza incarnata*		Schedule 7	Scarce	yes
Common twayblade	*Listera ovata*		Schedule 7		yes

Lesser twayblade	*Listera cordata*		Schedule 7	2 sites (recently refound abfter 100 years)	yes
Spring sandwort	*Minuatia verna*		Schedule 7	One site on mine waste	yes
Eelgrass	*Zostera marina*	OSPAR Threatened/declining habitat	Schedule 7	At least 3 sites for eelgrass. New sites discovered recently.	yes
Maerl	*Phymatolithon calcareum*	OSPAR Threatened/declining habitat	In Ramsey Marine Nature Reserve	A number of maerl beds recorded.	yes

Invertebrates					
Scarce crimson and gold moth	*Pyrausta sanguinalis*	Red Data list Endangered	Schedule 5	Known from Ayres where locally common	yes
Lesser beefly	*Bombylius minor*		Schedule 5	Known from Ayres where locally common	yes
Ocean quahog	*Arctica islandica*	OSPAR Threatened/declining species		Healthy population locally	yes
Lesser mottled grasshopper	*Stenobothrus stigmaticus*		Schedule 5	Found on Langness peninsula and nowhere else in the British isles.	yes

Ash-black slug	*Limax cinereoniger*	Red data list Vulnerable		One woodland site in north	
Dog whelk	*Nucella lapillus*	OSPAR Threatened/declining species		Abundant but thought to be in decline.	
Native oyster	*Ostrea edulis*	OSPAR Threatened/declining species		Very few records.	
Horse mussel	*Modiolus modiolus*	OSPAR Threatened/declining habitat	In Ramsey Marine Nature Reserve	Significant areas of reef in at least 3 sites. Individuals common in Manx waters.	yes
Edible mussels (intertidal)	*Mytilus edulis*	OSPAR Threatened/declining habitat	In Ramsey Marine Nature Reserve	Common at a number of sites, including Ramsey and Peel (but can be ephemeral).	

* Scarce plants of Britain, Stewart, Pearman and Preston

Common name	Scientific name	International significance (eg IUCN)	Protected on Isle of Man under Wildlife Act 1990	Status on Isle of Man	Mentioned in nomination paper text
Mammals					
Bottlenose dolphin	*Tursiops truncatus*	CMS, ASCOBANS	Schedule 5	Regular sightings	yes
Short beaked common dolphin	*Delphinus delphus*	CMS, ASCOBANS	Schedule 5	Regular sightings	yes
Grey seal	*Halichoerus grypus*	IUCN Least concern	Schedule 5	Good breeding population	yes
Leisler's bat	*Nyctalus leisleri*		Schedule 5	Regularly recorded	
Minke whale	*Balaenoptera acutorostrat*	CMS, ASCOBANS	Schedule 5	Regular sightings	yes
Risso's dolphin	*Grampus griseus*	CMS, ASCOBANS	Schedule 5	Regularly seen in summer.	yes
Stoat	*Mustela erminia*		Schedule 5	Occasionally recorded	
Harbour porpoise	*Phocoena phocoena*	CMS, ASCOBANS, OSPAR Threatened/decling species	Schedule 5	Most common cetacean, thought to be resident	yes
Orca	*Orcinus orca*	CMS, ASCOBANS	Schedule 5	Occasionally recorded	
Humpback whale	*Megaptera novaeangliae*	CMS, ASCOBANS, IUCN Least Concern	Schedule 5	Occasionally recorded	
Fin whale	*Balaenoptera physalus*	CMS ASCOBANS, IUCN Endangered	Schedule 5	Occasionally recorded	
Birds					
Little tern	*Sternus albifrons*	Amber-list of Birds of Conservation Concern in the UK, Bonn EAWA Annex 2 species	Schedule 1	One breeding colony on the Ayres foreshore	
Osprey	*Pandion haliaetus*	Amber-list of Birds of Conservation Concern in the UK	Schedule 1	Regular passage migrant	
Corncrake	*Crex crex*	Red-list of Birds of Conservation Concern in the UK, Bonn EAWA Annex 2 species	Schedule 1	Recently ceased breeding as far as is known.	yes
Curlew	*Numenius arquata*	IUCN Near threatened, Amber-list of Birds of Conservation Concern in the UK, Bonn EAWA Annex 2 species	Schedule 1	Resident. Currently population is steady.	yes
Hen harrier	*Circus cyaneus*	Red-list of Birds of Conservation Concern in the UK CMS Raptor's MOU	Schedule 1	Population has declined recently but still 20+ pairs? Good numbers roost in winter.	yes
Lapwing	*Vanellus vanellus*	Red-list of Birds of Conservation Concern in the UK, Bonn EAWA Annex 2 species	Schedule 1	Population in decline	yes
Manx shearwater	*Puffinus puffinus*	Amber-list of Birds of Conservation Concern in the UK	Schedule 1	Small breeding population	yes
Peregrine	*Falco peregrinus*	Annex III of Bern Convention	Schedule 1	Healthy breeding population	yes
Red billed chough	*Pyrrhocorax pyrrhocorax*	Amber-list of Birds of Conservation Concern in the UK	Schedule 1	Healthy resident population	yes
Yellowhammer	*Emberiza citronella*	Red-list of Birds of Conservation Concern in the UK	Schedule 1	Very small and declining population	yes
Grasshopper warbler	*Locustella naevia*	Red-list of Birds of Conservation Concern in the UK	Schedule 1	Small stable population	
Skylark	*Alauda arvensis*	Red-list of Birds of Conservation Concern in the UK	Schedule 1	Small stable population, declining in lowlands	yes
Starling	*Sturnus vulgaris*	Red-list of Birds of Conservation Concern in the UK	Schedule 1	Healthy resident population	
House sparrow	*Passer domesticus*	Red-list of Birds of Conservation Concern in the UK	Schedule 1	Healthy resident population	
Tree sparrow	*Passer montanus*	Red-list of Birds of Conservation Concern in the UK	Schedule 1	Local small resident population	yes

Herring gull	*Larus argentatus*	Red-list of Birds of Conservation Concern in the UK		Healthy resident population	
Song thrush	*Turdus philomelos*	Red-list of Birds of Conservation Concern in the UK	Schedule 1	Healthy resident population	
Linnet	*Carduelis cannabina*	Red-list of Birds of Conservation Concern in the UK		Healthy resident population	yes
Redwing	*Turdus iliacus*	Red-list of Birds of Conservation Concern in the UK		Regular passage migrant	
Grey partridge	*Perdix perdix*	Red-list of Birds of Conservation Concern in the UK		Very small and declining population	yes

Fish

Atlantic cod	*Gadus morhua*	IUCN Red list Vulnerable, OSPAR Threatened/declining species		No longer common. Approx 1 tonne per year landed commercially	yes
Basking shark	*Cetorhinus maximus*	IUCN Vulnerable (globally) Endangered (NE Atlantic), OSPAR Threatened/declining species, Convention on Migratory Species MoU on Sharks species (IOM has signed up via UK)	Schedule 5	Regular visitor	yes
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Brown trout	*Salmo trutta*	IUCN Least concern		Common	yes
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Reptiles					
Leatherback turtle	*Dermochelys coriacea*	OSPAR Threatened/declining species	Schedule 5	Occasionally recorded	yes

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Heath spotted orchid	*Dactylorhiza ericetorum*		Schedule 7		yes
Greater butterfly orchid	*Platanthera chlorantha*		Schedule 7		yes
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Pyramidal orchid	*Anacamptis pyramidalis*		Schedule 7	now only at the Ayres, not seen recently at Ronaldsway	yes
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Common twayblade	*Listera ovata*		Schedule 7		yes
Lesser twayblade	*Listera cordata*		Schedule 7	2 sites (recently refound abfter 100 years)	yes
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Ocean quahog	*Arctica islandica*	OSPAR Threatened/declining species		Healthy population locally	yes
Lesser mottled grasshopper	*Stenobothrus stigmaticus*		Schedule 5	Found on Langness peninsula and nowhere else in the British isles.	yes
Ash-black slug	*Limax cinereoniger*	Red data list Vulnerable		One woodland site in north	
Dog whelk	*Nucella lapillus*	OSPAR Threatened/declining species		Abundant but thought to be in decline.	
Native oyster	*Ostrea edulis*	OSPAR Threatened/declining species		Very few records.	
Horse mussel	*Modiolus modiolus*	OSPAR Threatened/declining habitat	In Ramsey Marine Nature Reserve	Significant areas of reef in at least 3 sites. Individuals common in Manx waters.	yes
Edible mussels (intertidal)	*Mytilus edulis*	OSPAR Threatened/declining habitat	In Ramsey Marine Nature Reserve	Common at a number of sites, including Ramsey and Peel (but can be ephemeral).	

* Scarce plants of Britain, Stewart, Pearman and Preston

Annex I

Annex I to the Biosphere Reserve Nomination Form, January 2013
MABnet Directory of Biosphere Reserves
Biosphere Reserve Description[8]

Administrative details
Country: United Kingdom, Isle of Man
Name of BR: Biosphere Isle of Man
Year designated: (*to be completed by MAB Secretariat)*
Administrative authorities: (17.1.3) Department of Environment Food and Agriculture, Isle of Man Government
Name Contact: (20.1) Peter Longworth
Contact address: *(+441624685149* Department of Environment Food and Agriculture, Isle of Man Government, Thie Slieau Whallian, Foxdale Road, St Johns, IM4 3AS peter.longworth@gov.im, info@biosphere.im
(20.1)
Related links There are two – one as an Isle of Man Government webpage, which also directs interested parties to the external website.

http://www.gov.im/about-the-government/departments/environment,-food-and-agriculture/biosphere-vannin/

www.biosphere.im

Social networks (16.4.3) https://www.facebook.com/biosphereisleofman
https://twitter.com/biospherelOM

Description
General description: *(Site characteristics in 11.1; human population in 10)*

The Isle of Man is situated in the centre of the Irish Sea. Its land mass is 572 sq km with a population of 85,000 (census 2011). The area includes spectacularly beautiful and varied coastline of cliffs, stacks, islets and long beaches (at the Ayres National Nature Reserve), and fine views of the central hills to a high point of 621 m at Snaefell. The hills hold important peat reserves and are deeply cut by wooded glens in the east. The coastal plain in the north holds pockets of unimproved grassland, pools and wetlands including the internationally important Ballaugh Curragh Ramsar site.

Biosphere Isle of Man extends out into the Irish Sea to cover all of the Isle of Man's territorial waters.
The sea bed has areas of great richness, horse mussel and Sabellaria reefs and maerl and seagrass beds, many of which are protected in the Ramsey Bay Marine Nature Reserve.

The core is made up of the legally protected areas of national significance both on land and in the sea. These are mainly Areas of Special Scientific Interest. Additional designations include National

[8] To be posted on the MABnet once the nomination has been approved. The numbers refer to the relevant sections of the nomination form.

Nature Reserve, Marine Nature Reserve, Area of Special Protection for Birds and Fisheries Protection Areas.

The whole area is under the administration of the Isle of Man Government
The use and enjoyment of UNESCO Biosphere Isle of Man is diverse. The countryside is farmed, with sheep, beef and dairy cows, as well as arable areas. The sea is harvested for shellfish. Tourism focuses on the distinctive island culture and landscape.

The area has a rich natural beauty and cultural heritage, a strong farming and maritime tradition and a distinctive sense of identity amongst its diverse population. The Manx language is enjoying a renaissance. The economy has now become remarkably diverse. (295 words)

Major ecosystem type: (14.1)
Shallow marine ecosystems, upland heath and moor, semi-natural grasslands, conifer plantations, deciduous woodland, wetland, built up areas.

Major ecosystems & land cover types: (11.6)
Major ecosystems and land covers types comprise: Shallow marine ecosystem , Upland heath and moorland, Semi-natural lowland grassland, Lowland heathland and mire, Wooded glen, Wetland, Built-up areas (urban greenspace).

Bioclimatic zone (11.5)
Moist sub-humid 'Temperate Coastal/ Marine Zone' with notably mild wet winters and cool wet summers, due to the oceanic influence.

Location (latitude & longitude): (6.1)

Cardinal points:	**Latitude**	**Longitude**
Most central point:	54° 13' N	4° 35' W

Total Area (ha): (7) 457,000

Core area *(s):* (7) 15,398

Buffer zone *(s):* (7) 114,670

Transition area *(s) :* (7) 326,932

Different existing zonation: (7.4) N/A

Altitudinal range (metres above sea level): (11.2) 0-621m

Zonation map(s): (6.2)

Main objectives of the biosphere reserve
Brief description (13.1)

"UNESCO Biosphere Isle of Man" will visibly demonstrate sustainable economic development through showing how a vibrant community, healthy ecosystems and a thriving, modern, diverse economy can co-exist and complement each other. The overall aim is to see the Isle of Man become an even better place for people and nature: the more our community gets involved, the more we can help the Island to stay special.
Three technical aims:
1) Conservation; taking care of our amazing landscapes, wildlife, culture, heritage and communities,
2) Development; improving our infrastructure and economy in ways that respect and support our unique environment,
3) Knowledge, learning and awareness; Helping more people to understand what makes the Island so special and encouraging active involvement in keeping it that way.

Research
Brief description (16.1.1)

A wide variety of research is taking place on the physical ('abiotic'), living ('biodiversity') and socio-economic environments which is relevant to the management of the biosphere reserve through the local higher education bodies and off-island research institutions. The Biosphere Steering Group plans to identify specific research questions and the needs to effectively understand and carry out key management activities in the area, to be supported through applied student research projects, alongside invaluable "Citizen Science" research programmes.

Monitoring
Brief description (16.1.1)

Various environmental, socio-cultural and economic monitoring programmes are carried out by a range of local public and voluntary organisations, contributing to knowledge of the present (baseline) situation set out in the nomination form and plans for forthcoming management strategy. The research plan will seek to strengthen the attributes of which Isle of Man residents are most proud, covering a range of factors that sustain a vibrant community, healthy environment and thriving economy.

Annex I Specific variables being researched or monitored (fill in the table below and tick the relevant parameters)

Abiotic		Biodiversity	
Abiotic factors		Afforestation/Reforestation	
Acidic (marine pH) Phdeposition/Atmospheric factors	√	Algae	√
Air quality		Alien and/or invasive species	√
Air temperature	√	Amphibians	
Climate, climatology	√	Arid and semi-arid systems	
Carbon stores	√	Autoecology	
Contaminants	√	Beach/soft bottom systems	√
Drought		Benthos	√
Erosion	√	Biodiversity aspects	√
Geology		Biogeography	√
Geomorphology		Biology	
Geophysics		Biotechnology	
Glaciology		Birds	√
Global change	√	Boreal forest systems	
Groundwater		Breeding	√
Ecosystem issues	√	Coastal/marine systems	√
Heavy metals	√	Community studies	
Hydrology	√	Conservation	√
Indicators	√	Coral reefs	
Meteorology	√	Degraded areas	
Modelling		Desertification	
Monitoring/ methods		Dune systems	
Nutrients	√	Ecology	
Physical oceanography	√	Ecosystem assessment	√
Pollution, pollutants	√	Ecosystem functioning/structure	√
Siltation/ sedimentation	√	Ecosystem services	√
Soil		Ecotones	
Speleology		Endemic species	
Topography		Ethology	
Toxicology		Evapotranspiration	
UV radiation		Evolutionary studies/Palaeoecology	
Soil temperature	√	Fauna	√
Tide heights	√	Fires/fire ecology	
		Fishes	√
		Flora	√
		Forest systems	
		Freshwater systems	√
		Fungi	√
		Genetic resources	
		Genetically modified organisms	

		Home gardens	
		Indicators	√
		Invasive species	√
		Invertebrates	√
		Island systems/studies	
		Lagoon systems	
		Lichens	
		Mammals	√
		Mangrove systems	
		Mediterranean type systems	
		Microorganisms	√
		Migrating populations	
		Modelling	√
		Monitoring/methods	
		Mountain and highland systems	
		Natural and other resources	
		Natural medicinal products	
		Perturbations and resilience	
		Pests/Diseases	√
		Phenology	√
		Phytosociology/ Succession	
		Plankton	√
		Plants	√
		Polar systems	
		Pollination	
		Population genetics/dynamics	
		Productivity	
		Rare/Endangered species	√
		Reptiles	√
		Restoration/ Rehabilitation	√
		Species (re) introduction	√
		Species inventorying	√
		Sub-tropical and temperate rainforest systems	
		Taxonomy (Marine)	√
		Temperate forest systems	
		Temperate grassland systems	
		Tropical dry forest systems	
		Tropical grassland and savannah systems	
		Tropical humid forest systems	
		Tundra systems	
		Vegetation studies	√
		Volcanic/Geothermal systems	
		Wetland systems	
		Wildlife	√

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

Role of women			
Sacred sites			
Small business initiatives	√		
Social/Socio-economic aspects			
Stakeholders' interests	√		
Tourism	√		
Transports	√		

Annex II

Annex II to the Biosphere Reserve Nomination Form, January 2013
Promotion and Communication Materials
For the Proposed Biosphere Reserve

Provide some promotional material regarding the proposed site, notably high quality photos, and/or short videos on the site so as to allow the Secretariat to prepare appropriate files for press events. To this end, a selection of photographs in high resolution (300 dpi), with photo credits and captions and video footage (rushes), without any comments or sub-titles, of professional quality – DV CAM or BETA only, will be needed.

In addition, return a signed copy of the following Agreement on Non-Exclusive Rights. A maximum of ten (10) minutes on each biosphere reserve will then be assembled in the audio-visual section of UNESCO and the final product, called a B-roll, will be sent to the press.

United Nations Educational, Scientific and Cultural Organization

Organisation des Nations Unies pour l'éducation, la science et la culture

Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura

Организация Объединенных Наций по вопросам образования, науки и культуры

منظمة الأمم المتحدة للتربية والعلم والثقافة

联合国教育、科学及文化组织

UNESCO Photo Library
Bureau of Public Information

Photothèque de l'UNESCO
Bureau de l'Information du Public

AGREEMENT GRANTING NON-EXCLUSIVE RIGHTS

Reference:

1. a) I the undersigned, copyright-holder of the above mentioned photo(s) hereby grant to UNESCO free of charge the non-exclusive right to exploit, publish, reproduce, diffuse, communicate to the public in any form and on any support, including digital, all or part of the photograph(s) and to licence these rights to third parties on the basis of the rights herein vested in UNESCO

   b) These rights are granted to UNESCO for the legal term of copyright throughout the world.

   c) The name of the photographer will be cited alongside UNESCO's whenever his/her work is used in any form.

2. I certify that:
   a) I am the sole copyright holder of the photo(s) and am the owner of the rights granted by virtue of this agreement and other rights conferred to me by national legislation and pertinent international conventions on copyright and that I have full rights to enter into this agreement.

   b) The photo(s) is/are in no way whatever a violation or an infringement of any existing copyright or licence, and contain(s) nothing obscene, libellous or defamatory.

Name and Address: Peter Longworth, DEFA, Thie Sleiu Whallian, Foxdale Road, St John's, Isle of Man. IM4 3AS

Date : 20/8/15

Signature :

(sign, return to UNESCO two copies of the Agreement and retain the original for yourself)

Mailing address: 7 Place Fontenoy, 75352 Paris 07 SP, Direct Telephone: 00331 – 45681687
Direct Fax: 00331 – 45685655; e-mail: photobank@unesco.org; m.ravassard@unesco.org

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