THE SOCIO-ECONOMIC POTENTIAL OF THE GALLOWAY AND SOUTH AYRSHIRE BIOSPHERE RESERVE

FINAL REPORT
for
DUMFRIES AND GALLOWAY COUNCIL
EAST AYRSHIRE COUNCIL
SOUTH AYRSHIRE COUNCIL
SCOTTISH NATURAL HERITAGE
FORESTRY COMMISSION SCOTLAND

by
MACKAY CONSULTANTS
and
RSK ERA

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SUMMARY

The purpose of this study has been to identify the social and economic potential of the Galloway and South Ayrshire Biosphere Reserve (GSABR) and to develop a strategy for maximising the area's sustainable social and economic development. The GSABR's primary aim is to "develop the Galloway and Southern Ayrshire Biosphere Reserve as a model region for sustainable community planning and economic development".

This study is intended to form a key part of a submission to UNESCO for Biosphere Reserve re-designation status. Biosphere Reserves globally have three stated complementary functions:

- Conservation of landscapes, ecosystems, species and generic variation
- Sustainable development of economic and human resources
- Logistic support for research, monitoring, education & information exchange

Whilst Biosphere Reserves require a balance to be struck amongst all three functions, the concept as recently developed is in essence a sustainable regional development tool. There is one other Biosphere Reserve in the UK in Devon, one under development in Wales and several others active in Europe.

In Germany Biosphere Reserves are used to help promote the quality of the environment to tourists, bringing additional income into the rural economy. In France, the Cevennes Biosphere Reserve brand adds value to local food and dying regional craft skills have been reinvigorated. In Switzerland, the Entebuch Biosphere Reserve has established a sustainable development forum which promotes local wood as a construction material and energy source for the 21st century.

This study tries to identify the uniqueness and potential of the Galloway and Southern Ayrshire Biosphere Reserve (GSABR), suggests priorities for its sustainable development and indicates the likely economic, social and environmental impacts of implementing a proposed outline action plan. It is also anticipated that the GSABR would also contribute potentially to wider regeneration objectives.

Section 2 of the report gives the background to Biosphere Reserves and the GSABR. It mentions examples and describes the proposed area, possible boundaries and main features.

Section 3 describes the approach and methodology used in the study. It is important to note that it is very difficult to forecast the impact of something which does not already exist and that might happen in the future, and consequently various assumptions have had to be made.

Section 4 discusses the environmental aspects. It assesses the likely environmental benefits of designation and also considers the potential carbon trading benefits.

Section 5 covers the social and economic aspects. It gives information on the existing situation, including baseline indicators, and sets out an outline strategy/action plan.

Section 6 assesses the potential impacts of the GSABR. The key sectors expected to provide economic benefits and which can provide quantifiable impacts are tourism, angling, renewable energy, small and medium-sized enterprises (SMEs) and food.

There would also be benefits for research and development, community participation and environmental projects but in this study it is very difficult to put economic values on such benefits.

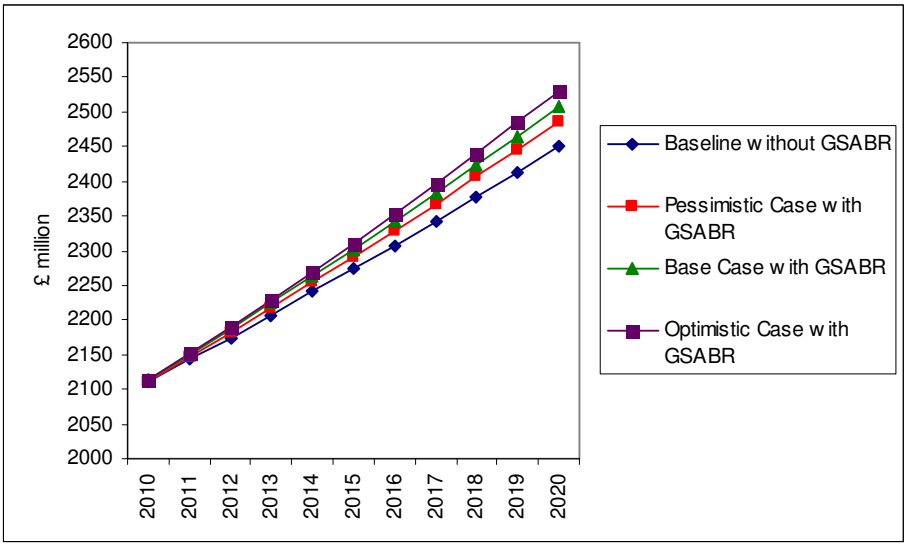
Several, tangible, potential flagship projects have been identified and suggested for inclusion in the GSABR. For the purposes of valuation, it has been assumed that most of the benefits from these projects and other projects would start during or soon after 2010, although river improvements can take up to 10-15 years or longer to provide a return in terms of fish stocks and angling impacts.

Section 7 sets out the conclusions of this study. Three scenarios have been provided: a base case, an optimistic case and a pessimistic case, with the base case considered to be the most realistic. The results suggest that, between 2010 and 2020, the development of the re-designated GSABR could provide an additional economic output (defined as gross value added GVA or gross domestic product GDP) from the base case of £56 million, with an annual average of about £5 million.

The results for the optimistic case are £80 million and £7 million annually, and for the pessimistic case £36 million and £3 million annually.

The figure below shows that without the GSABR it is assumed that economic growth in the area would average about +1.5% per year and with the GSABR it is estimated that: base case growth could be about +1.7% per year. The equivalent estimates for the optimistic scenario are about + 1.8% per year and for the pessimistic scenario about + 1.6% per year. The forecast additional GSABR growth is therefore +0.2% base case, +0.3% optimistic case and + 0.1% pessimistic case.

Estimated Economic Forecasts for the GSABR Area, 2010-2020: GDP £million



This economic growth would require to be funded by an estimated £9 million investment over 10 years from public and private sources. If the benefits are valued at £56 million they would provide a return or leverage of 6:1; if valued at £80 million, a leverage of 9:1; and if valued at £36 million, a leverage of 4:1. All of these are considered positive and encouraging benefit:cost ratios, bearing in mind that there will also be non-quantified environmental and other benefits.

The overall conclusion is that the re-designation of the Galloway and South Ayrshire Biosphere Reserve (GSABR) would result in very substantial economic, environmental and other benefits for the proposed area and that an estimated investment of £9 million would be very worthwhile, providing positive economic impacts for at least a 10 year period.

1.0 INTRODUCTION

The Study Brief

1.1 The purposes of this study were:

- to identify the social and economic potential of the Galloway and Southern Ayrshire Biosphere Reserve (GSABR) and
- to develop a strategy for maximising the area's sustainable social and economic development.

The client group comprises Dumfries and Galloway Council, East Ayrshire Council, South Ayrshire Council, Scottish Natural Heritage (SNH) and the Forestry Commission Scotland (FCS).

1.2 The study and strategy will then be used by the client group as a key part of its submission in September 2009 to the UNESCO "Man and the Biosphere" (MAB) Programme for Biosphere Reserve (BR) re-designation, according to the revised 1995 "Seville criteria" which were developed particularly to ensure the involvement of local communities.

1.3 Biosphere Reserves have three basic but complementary functions:

- a conservation function contributing to conservation of landscapes and eco-systems;
- a development function fostering socio-economic development which is sustainable;
- and a logistic function supporting research, monitoring, demonstration, education and training.

1.4 Biosphere Reserves are also organised geographically into three inter-related zones or areas:

- the core area with statutory environmental designations;
- the buffer zone where the logistic function would mostly occur;
- and the transition area where the socio-economic development is largely targeted.

1.5 The boundaries of these Galloway and South Ayrshire Biosphere Reserve (GSABR) zones or areas are still being considering. If approved by UNESCO, it is assumed for this study that the GSABR could start or be launched in 2010.

1.6 It should be stressed that as background to this study there are no published studies or clear data regarding the quantification of the economic and social benefits to BR areas nor is there any agreed methodology to measure them, although there is a UNESCO support team based in Paris and an international BR network underpinned by UNESCO.

1.7 Therefore the client group commissioned this study through a Steering Group in an attempt to estimate and quantify the potential benefits of a Biosphere Reserve in South West Scotland. At a meeting of some of the member organisations' representatives on 9th May 2008 the principle of taking forward the proposed GSABR was also strongly supported.

1.8 Two previous studies into BRs were commissioned by SNH and undertaken by Hambrey Consulting, one specifically into the Galloway Biosphere Reserve in 2005 and the other into the benefits of World Heritage Sites, Biosphere Reserves and Geoparks in 2007. Both of these studies were very helpful but mainly descriptive rather than quantitative.

1.9 During 2007, consultation regarding the proposed GSABR re-designation was also conducted by the Southern Uplands Partnership and East Ayrshire Woodlands, resulting in general support for the re-designated GSABR. That was followed in late November 2007 by a group visit to the Cevennes Biosphere Reserve in France.

1.10 The Steering Group for this study required further clarity about the benefits of BR re-designation for this area, particularly by
[1] identifying the additionality and synergy which it could provide, for rural areas, its local towns and smaller communities and
[2] by indicating how the BR might be delivered and monitored effectively, thereby maximising sustainable community and economic development.

1.11 The revised Biosphere Reserve re-designation, as with the existing designation, does not introduce any additional statutory powers nor does it provide any new funding resources but it confers UNESCO's internationally recognised status. Its socio-economic and environmental benefits will arise from the opportunities which this status will facilitate, but only if these opportunities can be accessed and maximised by the active participation of public, business and community stakeholders, with support from the various agencies through projects, initiatives and linkages throughout the GSABR area and indeed beyond its boundaries.

1.12 The study was time limited so it has required to focus on exemplar opportunities and flagship projects. We were asked by the Steering Group not to "go over old ground" so that has not been done except to undertake substantial background reading and the necessary research required. Indeed in this study we have tried to "plough new ground" and it will be for the Steering Group and others to cultivate that ground, sow the seeds, nurture the crop and reap the benefits.

1.13 During the study Mackay Consultants consulted as widely as possible within the time available and took on board the views of consultees to whom we are very grateful. However, the conclusions are those of Mackay Consultants, unless clearly indicated otherwise.

1.14 One of the main messages which seems to dominate is that for the GSABR to be meaningful and to fulfil its potential, there requires to be very tangible or specific projects throughout the GSABR and which can be clearly recognised or can specifically demonstrate GSABR success. The possibilities for some have been attempted to be identified and evaluated by creating a suitable framework.

1.15 An outline strategy and action plan was also required to be formed from this framework and was partly based on the activities of other Biosphere Reserves in Europe. The framework was also targeted at helping to quantify the benefits of BR status and to facilitate the use of baseline/monitoring indicators. This framework was drafted and used as the basis of discussion with consultees. In the absence of an existing strategy, there was general consensus with this approach, which seems to have given a clear focus to the study.

1.16 The Hambrey Consulting study of 2007 considered BR designation, including descriptive case studies which suggested various key benefits of BR designation, although none were quantified. These benefits were: enhanced leverage of funding for a range of purposes; stimulus to awareness raising and educational initiatives; enhanced tourism image and profile of the area; opportunities for niche branding of local products; sustainable development of socio-economic resources; environmental protection of landscapes and eco-systems.

2.0 BACKGROUND TO THE GSABR

2.1 The primary aim is summarised as **"developing the GSABR as a model region for sustainable community planning and economic development" and the study objectives were:**

- Identify and assess the economic potential of underlying assets in the GSABR area
- Develop a strategy, delivery process and actions to maximise sustainable development
- Identify opportunities to add value to existing activities and develop new activities
- Identify constraints restricting development of these new activities and opportunities
- Specify existing support available and additional support to encourage development
- Identify and specify baseline indicators for assessing development of the GSABR
- Identify a monitoring system to measure the additionality/synergy of the GSABR
- Recommend options for improved communication/marketing of the BR products.

Biosphere Reserves

2.2 The characteristics for Biosphere Reserve (BR) status are applied globally and have been described briefly, these characteristics being the basis of re-designated Biosphere Reserves throughout the world. There are many originally designated Biosphere Reserves, some of which, like South West Scotland, are now seeking re-designation.

2.3 There is a world network of both original sites dating back to the 1970s and now re-designated sites which are being restructured. BRs are said to be "living laboratories" for testing and demonstrating integrated management and sustainable development on a regional scale or as commented on "10% place and 90% process".

2.4 There were about 500 Biosphere Reserves sites throughout the world, some of which have a high tourism profile and are already known worldwide to the tourist industry, probably by destination name rather than by BR designation. Such sites include: Tenerife, in the Canary Isles; the Cevennes Region, France; Galapagos Biosphere Reserve, Ecuador; Uluru (Ayres Rock), Australia; and the Golden Gates Biosphere Reserve, USA. With original BRs, only areas of national statutory environmental designations were nominated where "the conservation role was kept prominent and the logistic and development roles were largely forgotten".

2.5 In the UK, 13 National Nature Reserves (NNRs) were originally nominated by the UK Government through the Nature Conservancy Council. By the late 1980s there were eight BRs including four in Scotland, three in England and one in Wales. The current status and future intentions of all of these BRs is somewhat unclear in relation to the 1995 "Seville criteria" and there is now a 2008 "Madrid Plan".

2.6 Braunton Burrows in North Devon, the Dyfi River Valley in Wales and the GSABR in South West Scotland now appear likely to be the only UK BRs in the foreseeable future. The 1995 "Seville strategy" for Biosphere Reserves also proposes the term "quality economies" to describe re-designated Biosphere Reserves which balance conservation and development. However there seems to be limited accessible information which was identifiable as specifically quantifying expected outcomes of Biosphere Reserves re-designation.

2.7 In 2002 an interesting survey was undertaken by UNESCO into the development of "quality economies" in 46 Biosphere Reserves worldwide. Most BRs are located in relatively poor rural areas where the local population also requires to exploit the natural resources for their living. The proportions of BRs conducting various economic activities were: 67% agriculture; 61% tourism; 39% forestry; 39% fishing/hunting; 26% services; 24% "industry"; 12% mining; 9% construction; 9% handicrafts; and 7% food processing.

2.8 In addition, this survey considered the use of eco-labelling to increase market prices of products from BRs: for primary products in 39% of BRs; for tourism in 36%; for other commercial entities in 11%; for publications in 4%; and for handicrafts in 2%. Chinese BRs were also surveyed in 2004 regarding eco-labelling as a way to increase market prices, which showed that: 73% of logo users were commercial enterprises; 11% were local people; 9% were nature reserves; 4% were local government; but that 33% of labelled products brought no benefit to local residents.

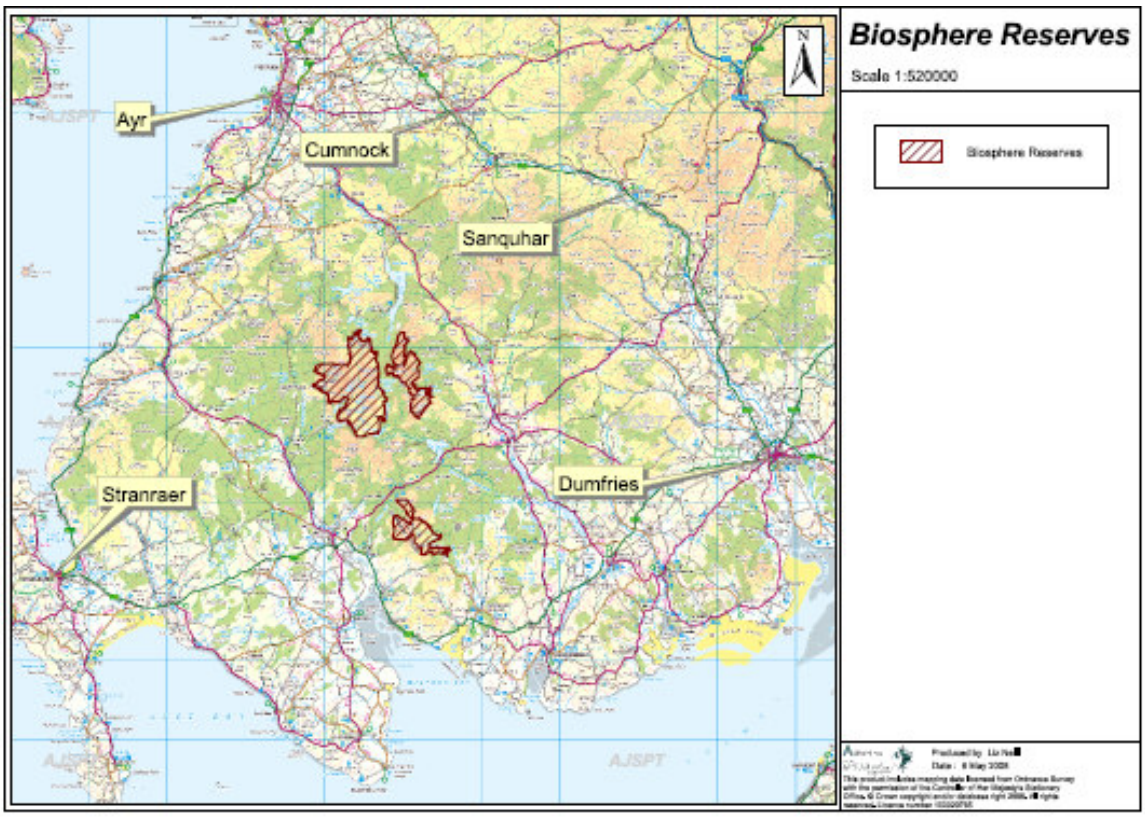
GSABR Background

2.9 The GSABR core area was first designated in 1976 and is composed of two, remote, discrete, publicly owned areas of moor, mountain and bog. The two core sites are Silver Flowe/Merrick Kells and Cairnsmore of Fleet. The sites total 10,000 hectares of almost totally unpopulated uplands within the Galloway Forest Park, in the geographical centre of South West Scotland.

2.10 Silver Flowe is a National Nature Reserve (NNR) within the Merrick Kells Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC), owned by the Forestry Commission and leased to SNH. Cairnsmore of Fleet is an NNR owned by SNH, with a visitor centre attracting about 5,000 visitors per year, although it is estimated by SNH that another 10,000 visitors per year walk directly to the summit.

2.11 There is no final agreement yet on the exact boundaries of the GSABR core area, buffer zone and transition area. For example, Luce Bay and Loch Doon may be included as part of the core area. Furthermore, although the 76,000 hectares publicly owned FCS Galloway Forest Park, which surrounds the designated core area, is the obvious buffer zone, the Park may be extended to include areas such as the Kyle Forest block. There are also many other areas with environmental designations within the proposed re-designated GSABR, particularly SACs and Special Protection Areas (SPAs) to the west and SSSIs to the south, which could form a more complex mosaic of multi-core areas and related buffer zones.

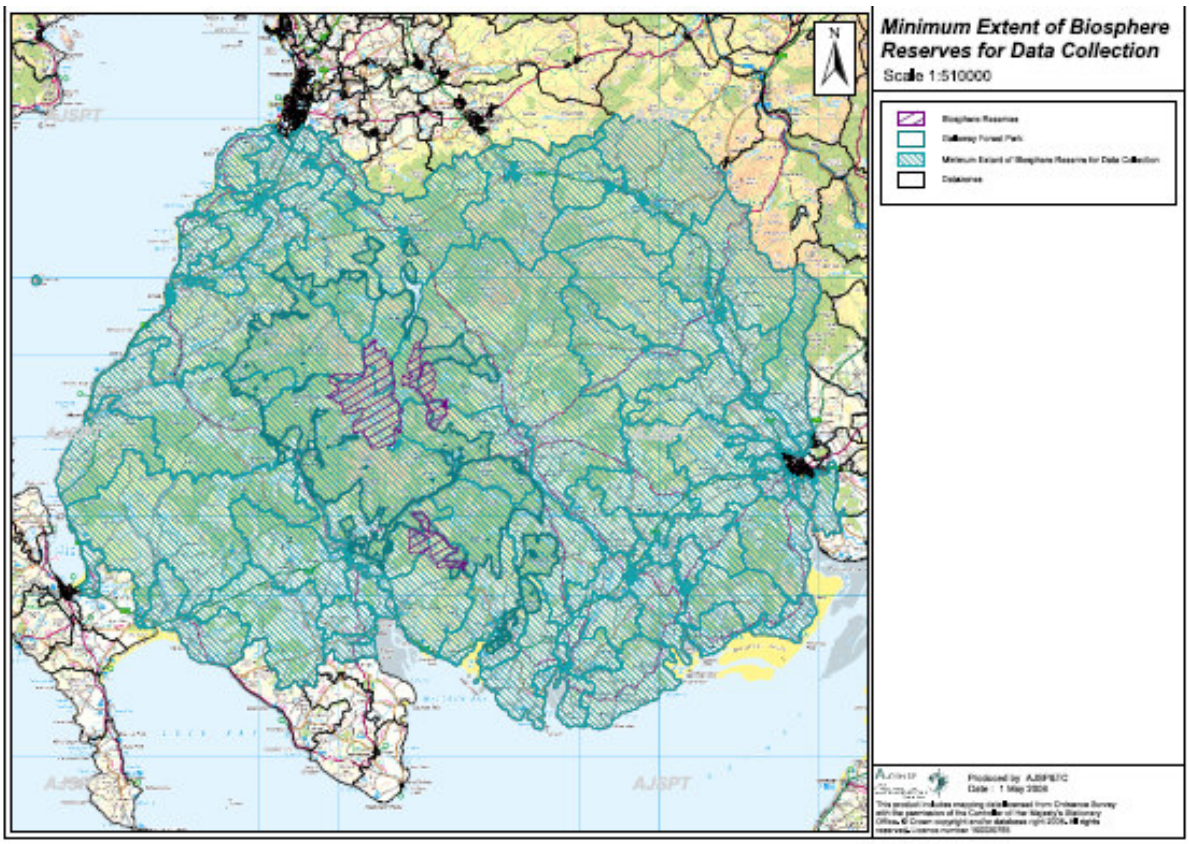
Loch Doon



2.12 Most members of the Steering Group considered that for this study a mosaic of core areas and a fragmented buffer zone would be confusing. However, others emphasised that what constitutes the buffer zone is still under discussion. The GSABR buffer zone is therefore best defined for this study as being the Galloway Forest Park, which is a commercial forest, mainly owned by the Forestry Commission Scotland, with a nearby population of 25,000. There are three existing visitor centres, and attracting about 167,000 actual visitors or 850,000 visitor days per year.

2.13 The GSABR transition area is not completely defined either, with its outer boundary having "fuzziness" around its edges. The minimum outer transition boundaries for this study were specified as including areas of Dumfries and Galloway, East Ayrshire and South Ayrshire, bounded by the coast of South Carrick and Galloway to the west and south, by the A76/Nith Valley to the east and by the River Ayr Valley to the north. Extensions to the outer boundary, including eastwards, could be added in future.

2.14 The river systems are also very important assets and help define the GSABR area. They are the Water of Girvan, the Stinchar, the Water of Dee, the Bladnoch, the Cree, the Kirkcudbright Dee and the Nith. Several lochs are in the GSABR area including: Lochs Doon, Braden, Riecawr in Ayrshire; Lochs Ken, Clatteringshaws, Crannoch, Dee and Trool in Galloway; and Afton Water in East Ayrshire. The wet central hills and the number of radiating rivers and lochs are an important part of the GSABR's character, marking its global uniqueness.



2.15 The economic additionality of the re-designated Biosphere Reserve will largely occur in the GSABR transition area but for this study we excluded the main towns of Dumfries and Ayr. The transition area has two contrasting characteristics, one a largely rural and coastal area and the other a once populous deep coalmining area. These areas individually probably lack the critical mass of population and demand required for many economic activities, and so the GSABR could provide a level of cohesion by bringing these areas closer together.

2.16 The main towns in the area are Maybole, Girvan, Stranraer, Newton Stewart, Wigtown, Whithorn, Kirkcudbright, Castle Douglas, Dalbeattie, Cumnock, Auchinleck, Dalmellington, Patna, New Cumnock, Sanquhar and Thornhill. Others such as Muirkirk and Catrine may be included later.

2.17 The upland rural part of the area is largely unpopulated, with a few small villages and very few roads. East Ayrshire is different. There were once about 10,000 coalminers employed in the deep mining industry before it was decimated in the 1980s and now there are only about 500 people employed in opencast mining.

2.18 The GSABR transition area is a proposed area and therefore cannot provide historical socio-economic data because it does not presently exist. In order to identify likely impacts and to develop a possible strategy for the reserve, impacts and benefits of other active re-designated BRs were reviewed but quantified data is very limited. The best sources of BR case studies are the Braunton Burrows BR, its environmental consultancy Envision, the Swiss Entlebuch BR, and the Cevennes National Park BR. Mention should also be made of the impacts of the well-known Eden Project in England, although it is appreciated that it is not a Biosphere Reserve.

2.19 It may be worthwhile providing a thumbnail sketch of the North Devon BR, which is the most advanced UK Biosphere Reserve and which serves as an exemplar for scene setting of the GSABR. The North Devon Biosphere Reserve covers the entire northern half of Devon, including Lundy Island, and is supported and funded by Devon County Council, North Devon District Council, Torridge District Council and Natural England. It was re-designated in 2002. Its core area is Braunton Burrows, which is a unique dunes system owned privately by Christie Devon Estates.

2.20 In the North Devon BR there is a Green Tourism Business Scheme, which is introducing branding and accreditation, provides environmental advice through Envision, operates agri-environmental advice schemes and provides free conservation advice to small-holders.There are also various conservation and educational initiatives.

2.21 The 13 staff are not all full-time BR staff and are mainly countryside ranger and AONB staff. The manager is also the chairman of the UNESCO Biosphere Reserves UK Committee. In addition to the core budget provided by the public sector, the North Devon BR has received project funding from Natural England, LEADER Plus, DEFRA, Environment Agency, Regional Arts Lottery, South West Arts, Devon County Council, the Tarka Trust and Millennium Commission.

3.0 APPROACH AND METHODOLOGY

3.1 Our proposal for this study included an outline work programme indicating our approach and methodology and subdividing the work programme into three phases:

[1] Preliminary research;
[2] Analysis; and
[3] Report and plan production.

3.2 Phase 1 Preliminary research included tasks 1-6:

(1) Meeting the Steering Group
(2) Reviewing existing information
(3) Reviewing existing UK BRs
(4) Finalising study methodology
(5) Assessing area's characteristics/trends
(6) Consulting local stakeholders.

3.3 Phase 2 Analysis included tasks 7-9:

(7) Impact assessment
(8) Development plan
(9) Monitoring framework.

3.4 Phase 3 Report and plan production included tasks 10-13:

(10) Preparation of draft report,
(11) Discussion of draft report
(12) Completion of final report,
(13) Participation in workshop(s).

3.5 The study brief stated that "there appears to be no published studies quantifying the economic and social benefits of specific Biosphere Reserves (BR) or any agreed methodology to measure them. In particular there are no studies which try to measure the benefits of BR designation itself as distinct from the benefits of developing the underlying assets in an area."

3.6 Because of this situation there was no framework against which to achieve the study objectives. Therefore we initially adopted the Hambrey Consulting 2007 six unquantified benefits of BR designation and translated them into quantifiable strategic aims, namely:

- enhanced leverage of funding for a range of purposes
- stimulus to awareness raising and educational initiatives
- enhanced tourism image and profile of the area
- opportunities for niche branding of local products
- sustainable development of socio-economic resources
- environmental protection of landscapes and eco-systems.

3.7 Furthermore, it was generally recognised by the Steering Group that a BR needs some flagship projects to demonstrate Biosphere Reserve success and to highlight the character of the region. Therefore we formulated an outline strategy and action plan to act as a framework for this study, partly based on the activities of other BRs in Europe, building on the Hambrey conclusions and incorporating the Steering Group's suggestions. This framework was targeted at helping to quantify the benefits of BR status and to facilitate the use of baseline/monitoring indicators. It was discussed with consultees who generally agreed that this approach provided focus.

3.8 The finalisation of the methodology was Task 4 and it required innovative thinking to provide the clarity and focus required, because of the lack of methodology referred to previously. Having reviewed existing information sources and other Biosphere Reserves, along with area familiarisation visits and from our own experience, it was obvious that

- there was enormous potential for overload from a wide range of unquantified or descriptive information and
- there are many existing initiatives in the area from which the Biosphere Reserve re-designation would need to distinguish itself and/or would require to add value, without substitution or displacement, and to become a regeneration catalyst.

3.9 In order to quantify the GSABR benefits required by the study brief, a pragmatic approach was taken to the study by working back to or thinking through benefits and strategy from outcomes and impacts. The BR framework was devised as a two stage matrix: stage [1] comprising possible BR components and applying/scoring these components for added value without displacement against sectors and activities; with stage [2] being the ranking and weighting these BR components and sectors/activities to identify those with most potential for providing added value. This framework was used as the basis of consultation with stakeholders and their comments helped to direct the study.

3.10 In the time available, the consultees, mostly in Ayrshire and Dumfries and Galloway, were:

1. Ayrshire Joint Structure Plan & Transportation Managers
2. East Ayrshire Council, Corporate Support and Neighbourhood Services
3. Dumfries & Galloway Council Planning & Development
4. Forestry Commission Scotland, Galloway Forest District
5. East Ayrshire Woodlands
6. SNH, Newton Stewart and Dumfries
7. Southern Uplands Partnership (SUP)
8. Ayrshire Rivers Trust
9. Galloway Fisheries Trust
10. Galloway Angling Centre
11. Joan Mitchell, Visit Scotland, SNH, SUP
12. Graeme Hume, ex Savour the Flavours
13. David & Wilma Finlay, Cream of Galloway/Caledonian Organics
14. Mark Gibson, Craigengillan Estate/Dumfries House
15. Robert Gladston, Stair Estate
16. Catstrand, New Galloway
17. Scottish Enterprise, Dumfries
18. Scottish Rural Development Programme, Dumfries & Galloway
19. Scottish Rural Development Programme, Ayrshire
20. Lowlands & Uplands Programme Scotland/ESEP Limited
21. Interreg 1V and Leader + Programmes

22. Andy Bell, Biosphere Manager, North Devon; Chairman UK MAB
23. Ros McNay, Leader, Dumfries & Galloway
24. Co-ordinators of Spring Fling, Open Doors, Music Festivals, Ayrshire Makers, Environment Week, Food Festival, Gael Force and other rural events managers.

3.11 The framework of the possible BR components and their potential additionality for sectors and communities was discussed with consultees, which resulted in general agreement with the framework and some additions to it being suggested. In each consultation it was attempted to identify the likely impact of the GSABR on each consultee's activity and sector, specifically and generally, sometimes successfully, sometimes unsuccessfully.

Dumfries House

3.12 Impacts were unidentifiable if consultees were unsure about the benefits of the GSABR but, overall, as indicated previously, consultees were in favour of the GSABR and its potential additionality. Many consultees felt that if the Biosphere Reserve re-designation did not proceed not much would be lost, whilst if it did proceed, a critical mass could be developed but tangible projects would also be required.

3.13 The culmination of Phase 1 was Task 5 which was an assessment of the GSABR's key characteristics and trends, also informed by the framework and the consultations. As mentioned, one of the main messages from the consultations was that if the Biosphere Reserve re-designation did not proceed, little would be lost with other initiatives filling the gap but if it did proceed it could result in additionality, cohesion and synergy which other initiatives could not provide.

3.14 The framework was also used as the basis for the Phase 2 analysis, informing the tasks of undertaking [7] the impact assessment, [8] the development plan or outline strategy and [9] the monitoring framework.

The Study Framework

3.15 The framework was necessary to anchor the study, to undertake effective consultation, to quantify potential impacts, to relate to locations and to suggest a strategy. From our research into Biosphere Reserves elsewhere, subsequently from our consultations and from our own experience, a range of possible GSABR components was developed, applied to economic sectors and other activities and scored for additionality.

3.16 Because there was not an existing GSABR strategy to evaluate and because many consultees were uncertain of possible outcomes of the GSABR, a framework was required to drive the study forward. Nevertheless, in the time available, it was never intended to provide a definitive study but was more designed to generate indicative components, which would support the Steering Group and its constituent members to progress the GSABR and indeed provide a model as a basis of further discussion and future adaptation by the Steering Group.

3.17 This scoring for additionality was undertaken in relation to a range of economic sectors, community activities and environmental opportunities. It then allowed the components and the sectors, activities and opportunities to be ranked and weighted, thereby providing a means of focusing the study in an attempt to quantify the best impacts.

3.18 The scoring was undertaken as objectively as possible and it inherently targeted impacts which would have limited substitution or displacement effects. It was also based on local consultations, our own experience and Hambrey's three "considerations" with which Mackay Consultants agree of [1] potential business opportunities, [2] socio-economic needs and [3] local engagement capacity.

3.19 The main issue when applying the framework was whether or not the BR would bring additionality to the GSABR area. Additionality tests commonly used include:

- a Legal and Regulatory Test: is the BR being implemented to fulfil policies, regulations or standards?
- an Investment Test: would the BR have gone ahead without a push from the agencies?
- a Barriers Test: does the BR overcome barriers such as local resistance, lack of know how or institutional barriers?
- a Common Practice Test: does the BR employ innovative methods which would not likely have happened otherwise?

3.20 Any additionality test, no matter how quantitative and seemingly objective, creates some false positives (projects which appear additional although they are not) and some false negatives (projects which appear not to be additional although they are). The judgement as to which is more acceptable is usually determined by policy. In the case of a BR, many potential components or developments could occur as a normal part of sustainable development. However, by using tests like those above in combination, it was identified that BR status would confer greater additionality on some BR components than on others and the framework and its matrices were developed to quantify the amount of additionality.

3.21 The ranking of the potential impact of GSABR components was also weighted to provide additional clarity and then the impacts of the GSABR were quantified or evaluated against baselines, such as increased tourist expenditure, increased economic output (GVA, gross value added), value of environmental advice, number of new businesses, etc. The aim of this impact evaluation was ultimately to aggregate the best impacts which can be justified and which would contribute clearly, or indeed otherwise, to the total impact of the GSABR.

3.22 The framework matrices are provided in Appendices 1 and 2, showing the scored/ranked components of the GSABR.

3.23 <u>GSABR Components</u>

- UNESCO Biosphere Status: international recognition with inherent marketing value
- Gateways to the GSABR: longer term, two or three gateways, perhaps partnerships
- Public Information Points: shorter term, 30-50 information points in shops, garages
- GSABR linked Website: a new dedicated, interactive, linked website, counting hits
- GSABR Public Signage: provided by public agencies to inform, direct, retain visitors
- Access to Funding Sources: quality applications for project funding with additionality
- Biosphere Eco-Labelling: entry level, labelling scheme, paid-up/approved members
- Biosphere Eco-Accreditation: accredited, branded logo for local products and services

- Eco-Transport Schemes: biofuel buses; tourist/community transport; Biosphere tours
- Public Agencies' Support: local councils, other agencies support/community planning
- Eco-Business Advice: environmental business advice, cost savings & increased sales
- Eco-Training Opportunities: provision of eco-skills training: awareness to vocational
- Research & Development: in the buffer zone, with a need for r & d projects/facilities
- Eco-SME Start-Up Fund: pilot project, re-cycling loans for 25 eco-approved start-ups
- Business Co-op Events: meet the buyer events, local producers selling to local buyers
- International Conferences: hosting larger events, generating income and networking
- Local Biosphere Clubs: for local communities to participate actively in opportunities
- Rural Biosphere Networks: for rural communities to develop/network opportunities

3.24 These components were scored 0-3 for additionality to sectors, communities, environment:

Economic Sectors

- Accommodation: tourist accommodation and sub-sectors, with potential in E Ayrshire
- Visitor Attractions: important sub-set of tourism market contributing visitor numbers
- Arts & Crafts: very active sector, with themed towns, Spring Fling and music/drama
- Walking sub-sector: largest tourism sub-sector, almost 60% of visitors being walkers
- Cycling sub-sector: important sub-sector for Galloway with part of 7stanes bike trails
- Angling sub-sector: key sub-sector with great potential, good impacts across the BR
- Shooting sub-sector: part of country sports on large estates, may be linked in future
- Agriculture: key economic sector with increasing environmental contribution
- Food Products: active sector, high quality, small producers, no mass, small abattoir
- Forestry: Galloway Forest District of 97,500 hectares is UK largest commercial forest
- Timber Products: 500,000 t/a timber harvested, 85% sold to local sawmills/processors
- Renewables: scope for more renewables from timber and hydro (and wind farms)
- SME Businesses: Dumfries&Galloway dominated by SMEs, 87% employ <10 staff
- Shops & Retail: E/S Ayrshire has a good retail sector, D & G has local, quality shops
- Manufacturing: Manufacturing is important in all three of the local authority areas.

Social Economy

- Rural: rural environment with small, distributed population, potential for networking
- Towns: built heritage varies within area, notably between E Ayrshire and elsewhere
- Initiatives: many existing initiatives, good community partnerships are major assets
- Housing: provision of affordable/improved housing is a key need for communities
- Transport: scope for capitalising on existing rail stations and community transport
- Education: potential to increase/organise environmental awareness/education locally
- Recreation: opportunities for improvement of recreation & health of local populations
- Volunteering: opportunities for participation and a measure of interest by locals in BR

Environmental Opportunities

- Flood management: climate change and increased flooding; hazard management work
- Conservation work: many people are employed in nature conservation in BR area
- Water Supply: catchments provides the basic water resource for a much wider area
- Carbon Trading: carbon sequestration expected to provide income during this decade
- Landscape Management: maintains resources underpinning tourism and in-migration

3.25 These brief descriptions of the possible components, economic sectors, social economy and environmental opportunities, summarise the characteristics of these categories which were scored and ranked in the Stage 1 matrix. Having discussed the matrix during the interviews, the categories were re-scored, weighted and re-ranked in the Stage 2 matrix to reflect intelligence gathered from the consultees. That enabled the study to focus tightly on the best, specific, quantifiable impacts and to generate an outline strategy and action plan.

3.26 The scoring and ranking matrices are provided in Appendices 1 and 2. In order to provide additional clarity and underline justification of the selection of particular components, all the BR components were ranked and placed in the top 50% or bottom 50%, as were the BR sectors/activities. Other combinations are important but, for this study, the consensus was that most of the best combinations provided the suitable and measurable targets for a GSABR strategy. Sectors or sub-sectors and components which did not score highly enough, at least in this study, could - and indeed should - be reviewed in the future as the BR strategy develops.

3.27 Components were also scored low or zero and ranked low or excluded when: in the absence of a BR they were already being well serviced (such as agriculture, forestry, cycling and shooting); or because there would be an uncertain return from a high initial cost (such as expensive gateways and labelling/branding); or because there would be a strong element of substitution or displacement involved; or because some sectors or sub-sectors (such as tourist expenditure in shops) are already included in baselines and therefore impacts and would constitute double-counting.

3.28 The initial results are summarised in Table 3.1 below.

Table 3.1: First Rankings of GSABR Components and Sectors

COMPONENTS	first ranking	no. 3s	% 3s	weighted ranking	SECTOR	first ranking	No. 3s	% 3s	weighted ranking
Global Status	1	6	33	**1**	Attractions	1	6	33	**1**
Funding Sources	1	5	28	**3**	Initiatives	2	4	22	**2**
Co-op Events	2	2	11	**8**	Angling	2	4	22	**2**
Start-Up Fund	3	5	28	**4**	Arts/Crafts	3	4	22	**3**
Website	4	7	39	**2**	Rural	3	2	11	**5**
Planning Support	5	0	0	**13**	Food	4	1	6	**6**
Eco-Advice	5	4	22	**6**	SMEs	4	2	11	**5**
Eco-Training	6	4	22	**7**	Recreation	4	0	0	**8**
GSABR Netwks	7	2	11	**9**	Accomm.	5	2	11	**5**
50% of first ranking									
Large Events	8	1	6	**11**	Cycling	6	1	6	**6**
GSABR Clubs	8	1	6	**11**	Towns	6	2	11	**5**
Research & Dev.	9	6	33	**5**	Volunteers	6	0	0	**8**
Gateways	10	2	11	**10**	Walking	7	1	6	**7**
Information Points	11	1	6	**11**	Conservn.	7	5	28	**2**
Signage	12	1	6	**12**	Rnewables	8	3	17	**4**
Eco-Labelling	13	0	0	**13**	Carbon Tr.	8	2	11	**5**
Eco-Transport	14	1	6	**12**	Education	9	2	11	**6**
Eco-Accreditation	15	0	0	**13**	Land Man.	10	1	6	**7**
100% of first ranking									

3.29 The components and sectors were also weighted by applying "% of 3s" scored to the rankings and then re-ranked to provide greater clarity, as set out in Table 3.2. The rankings indicated that the study should focus on the impacts derived from the top 50%, or to be more inclusive the top 75%, of re-ranked combinations, most of which have quantifiable impacts against estimated baselines.

3.30 From this analysis, the components and impacts focused on, and quantified later demonstrate, the potential of the GSABR and are in: tourism including accommodation, attractions, arts & crafts and shopping; angling, renewable energies, small and medium-sized enterprises (SME), food, research and development (R &D), communities and environment.

Table 3.2: Weighted Rankings of GSABR Components and Sectors

GSABR Components	Weighted Re-Ranking	**GSABR Sectors**	Weighted Re-Ranking
Global Status	**1**	Visitor Attractions	**1**
Website	**2**	Local Initiatives	**2**
Funding Sources	**3**	Angling	**2**
Start-Up Fund	**4**	Nature Conservation	**2**
Research & Develop.	**5**	Arts & Crafts	**3**
Eco-Advice	**6**	Renewables	**4**
Eco-Training	**7**	Rural Areas	**5**
Business Co-op Events	**8**	Small SMEs	**5**
GSABR Networks	**9**	Tourist Accommodation	**5**
50% of weighted ranking			
Gateways	**10**	Local Towns	**5**
Large Unesco Events	**11**	Carbon Trading	**5**
GSABR Clubs	**11**	Local Food	**6**
Information Points	**11**	Cycling	**6**
Signage	**12**	Education	**6**
75% of weighted ranking			
Eco-Transport	12	Walking	7
Planning Support	13	Landscape Management	7
Eco-Labelling	13	Recreation	8
Eco-Accreditation	13	Volunteers	8

3.31 Funding provided via the GSABR is not strictly a GSABR component, yet is necessary to resource and deliver GSABR components. It was therefore classed as a component and additionality from that funding was classed as an impact. We recognise the danger of double-counting here, but consider that quality project development would potentially lead to additional match funding.

4.0 ENVIRONMENT

Environmental Character

4.1 The environmental character of the GSABR has been outlined in preceding sections. In summary, the key environmental assets of the area are the hills, the lochs, the rivers, the peatlands, the glens, the forest and the farmlands. This is a gentle green Scottish landscape with a wild upland heart.

4.2 The core area of the GSABR contains nationally important natural assets, UK National Nature Reserves and EC SACs, unique because they are wet, high and remote:

- Cairnsmore of Fleet and the Merrick – mountain plateaux of exposed moorland, blanket bog, acid grassland, wet heath, crags, rocky lochans, heather, raptors
- Silver Flowe – mire of peat moss with ribbon pools, quaking bogs, dragonflies, carnivorous plants. Ecologically significant but comparatively inaccessible to visitors: bog surface is unsafe for walking.

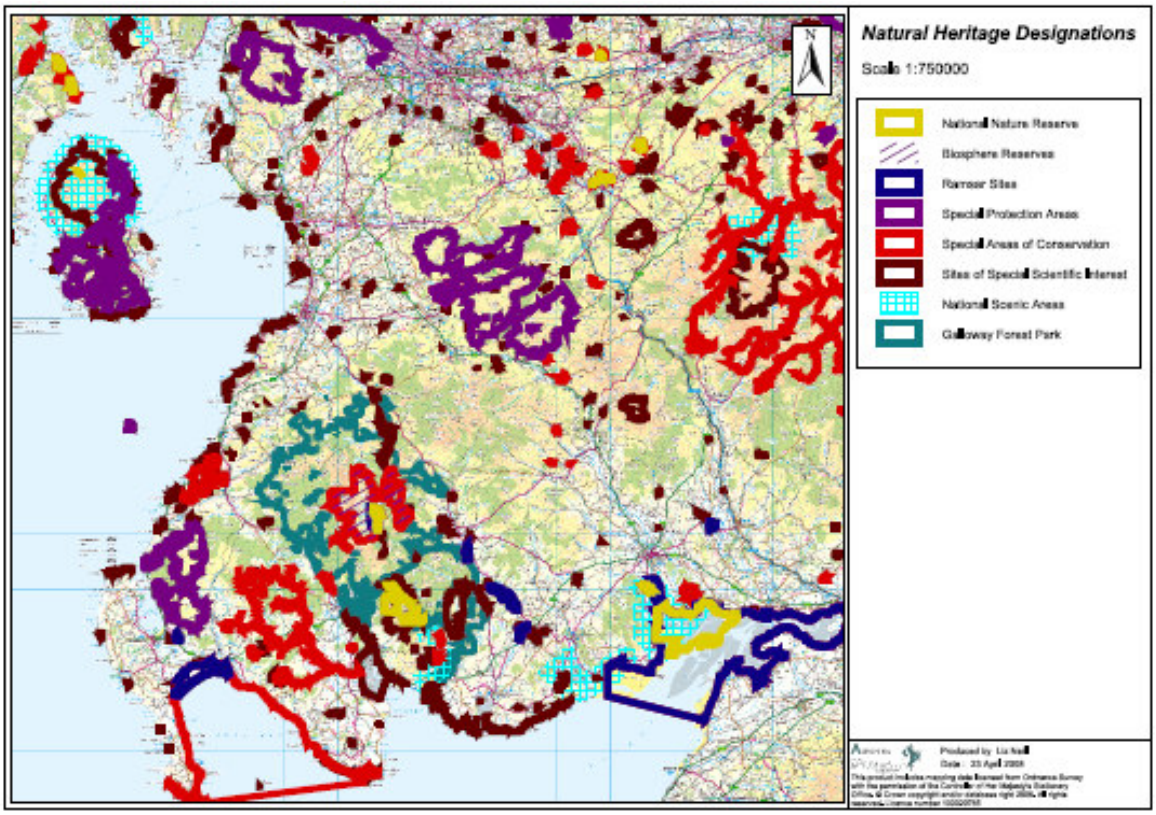
4.3 The buffer and transition areas of the GSABR also contain some globally important assets, including:

- Many moorland Special Protection Areas (especially moors above Muirkirk, Catrine, Kirkonnel and Cairnryan)
- River Bladnoch – comparatively unspoilt salmonid river (EC SAC)
- Parts of Loch Ken and Solway Firth – winter-time wildfowl sanctuaries for migratory birds (EC SPA, international RAMSAR)
- Several semi-natural woodlands along river valleys and gorges.

4.4 Natural resources derived from these assets include abundant water, food (meat and dairy), fuel (timber, wind energy, hydro energy), minerals (especially coal), building materials (stone, timber, slate). The region is naturally deficient in arable land, as a result of a wet climate, and is comparatively remote from cities and transport. The main drivers of change for the environment are policy, economics, and climate change. These drivers change how land is used, and change the pattern of natural assets and hazards.

4.5 In the last fifteen years, the main land use trend has been towards increased afforestation and the loss of acid grassland. The Common Agricultural Policy had caused upland agriculture to intensify with increased sheep numbers and some upland overgrazing, but more recent policy and economic changes have resulted in sheep numbers decreasing, cattle numbers increasing and some areas becoming unused. These trends are well referenced in many reports and in the Scottish Agricultural Census. In 2008, as a result of increasing food and energy prices, arable crops are increasing in the lowlands, and windfarms have been developed over moorlands and forests in the uplands.

4.6 Built heritage trends have been driven by house price rises, which have resulted in the renovation and reclamation of old farm buildings for housing, and the spread of new housing, some sporadic, and some on the outskirts of towns and villages. However, the GSABR area has fewer new houses than many other areas of the UK.


Natural Heritage Designations
Scale 1:750000
National Nature Reserve
Biosphere Reserves
Ramsar Sites
Special Protection Areas
Special Areas of Conservation
Sites of Special Scientific Interest
National Scenic Areas
Galloway Forest Park

Environmental character of the GSABR:
Edited excerpts from the Southern Uplands Partnership website (www.sup.org)
The "Southern Uplands" is the entire south of Scotland range of hills, and includes all uplands across Ayrshire, Lanarkshire, Dumfries and Galloway and Scottish Borders. Likewise, the SUP covers all south Scotland. However, references to the Borders and Lanarkshire were removed from this extract.

Uplands
The Southern Uplands landscape of high domed hills and plateau is recognised as a European mountain massif, just like the Scottish Highlands, the Pyrenees and the Alps. Up on the tops, the windswept moorlands that blanket the plateau are riddled with streams and sprinkled with lochs. As snow lies later here than anywhere else south of the Highlands, the mountain heaths are refuges for Arctic and alpine species at the southern limit of their range, like the woolly hair moss that grows amongst lichen-rich blaeberry heaths. Dark, peaty pools are scattered amongst blanket bogs' drier hummocks of springy heather that sprout tufts of cotton grass. The drops fringing sundew plants glitter in sunshine and azure hawker dragonflies provide iridescent flashes. Wider expanses of heather and bog moss cover deep peat. Golden eagles survive.

Mid altitude moors, like those above Muirkirk and Cairnryan, are vast moorlands of big skies and long views. Much moor has become forest or grass, but some heather moorland is still 'muir' burned to maintain the habitat for red grouse, creating strange banded patterns. Peregrines, hen harriers, buzzards and merlins soar through the open skies. Rare black grouse (and black cock leks) may be seen on the moorland margins. The evocative calls of curlew pierce the air, and other waders - golden plover, dunlin and redshank - wheel over the wetlands.

Down from the moors, the hill slopes and undulating foothills are cloaked with green pastures dotted with sheep, or swathed in dark green coniferous plantations. Cattle and sheep grazed these hills for over 5,000 years, with sheep and conifer forest becoming dominant during the last half century. This has reduced heather cover, allowing bracken and moorgrass to take over. The reintroduction of cattle and diversification of woodland would allow more diverse plant communities to regenerate.

Woodlands
Until 6,000 years ago, woodland covered valley floors, slopes and hilltops - only the high tops and some wetlands were treeless. Since then, almost all of the original woodland has been cleared from the Southern Uplands and today much of the land is farmed, grazed by sheep. Distinctive remnant native woodlands surviving in gorges and glens, and fragments of ancient wood pasture are refuges for birdlife and internationally important mosses, liverworts and lichens. Scattered fragments of ancient juniper and willow scrub still exist.

Tree plantations have a long history, starting hundreds of years ago with Scots pine and oak. In the 17th century, landowners began planting within the 'policies' of large estates, using a wide range of non-native species. Designed parklands 18th and 19th century continued this process, with scattered mature trees set within grassland providing an important habitat. Since the mid-1980s, there has been increased interest in the protection of native woods as many are nearing the end of their natural lives. A number of Community Woods have been established across the south of Scotland and this initiative is growing.

After the Second World War, there was a major expansion of conifer forests, mainly introduced Sitka spruce. These productive forests provide the vast majority of the tree cover in the Southern Uplands and have had a major impact on the landscape. Since the late 1980s, Forest Enterprise has been combining timber production and landscape enhancement, and now forest design plans have more broad-leaved trees, Scots pine and open ground. Short-eared owls and black grouse are found in young and re-stocked forests. Mature forests are home to crossbills, siskins, goshawks and long-eared owls. At the northern limit of their range, nightjars may be heard in the late evenings. Red squirrels still thrive as they can extract conifer seeds more efficiently than grey squirrels and ways of discouraging greys are being trialled by forest managers. Sika and roe deer are widespread and red deer are found in the west. Sika deer have been introduced to the east.

Farmlands
Since Neolithic times over 6,000 years ago, farmers have influenced the landscape of the Southern Uplands. The lowland farm landscapes have richly coloured soils, flat or gently sloping ground, bounded by drystone dykes, mature hedges and tree avenues. Varied cropping provides seasonal varieties of colours and textures. Around Ayr, mixed and arable farming have created larger, more open fields. Many farms have remained in the ownership of the same family for generations. The oldest farm buildings date back to the 17th century and use local stone and traditional building designs. Farmers in the south of Scotland are famed for the excellence of the dairy and beef cattle and the sheep they breed. Lowland livestock and dairy farms are intensively managed with ryegrass pasture and fodder crops for the cattle. The mild, wet west is particularly good grass growing country and favoured by dairy farmers.

Arable cropping is largely restricted to the lighter, drier soils of the lower river valleys and coastal plains. Winter wheat and barley are the main crops with smaller areas of oilseed rape, well known varieties of potatoes and root crops. Arable land sustains birds like the skylark, linnet, tree sparrow, reed bunting, song thrush and grey partridge that are declining in other agricultural areas. Annual weeds attract insects and provide seeds while stubble offers vital winter-feeding. Red kites have been reintroduced in Galloway, and are proving a visitor attraction. Delicate wild flowers, including orchids, devil's-bit scabious and hawkbit thrive in older grassland and roadside verges, where voles are hunted by kestrels and barn owls. Deciduous trees, hedges, stone dykes and boundary habitats created by farmers are important wildlife refuges and can act as wildlife corridors, allowing wildlife to disperse or colonise new areas.

Ditches, streams and areas of wetland, including rushy low-spots in pastures, river-valley meadows and lowland raised bog, are all important habitats for freshwater invertebrates and birds. Ragged Robin, Marsh Marigold and Meadow Sweet are among the plants found in the wetland areas.

Water
Running water shapes the landscape, provides power and is an essential habitat for freshwater plants, insects, fish, birds and otters. From lochs that fill troughs gouged by glaciers and peaty pools on the mountaintop bogs, the uplands are drained in all directions by an extensive network of river systems.

In the numerous rivers, pike, perch and grayling are widespread, and lampreys and eels also occur, all providing good hunting for otters. Aquatic plants flourish in the clean, clear waters; goosanders, dippers and grey wagtails thrive, sand martins colonise sandbanks in summer, and ospreys have recently returned. The River Cree and its estuary support very rare fish - the sparling, the allis shad, and the twaite shad. High in the Galloway hills and western moors, the lonely call of the black-throated diver carries over remote lochs. Loch Doon has the only southern Scottish population of Arctic char, a fish that used to migrate to the sea before becoming isolated as temperatures rose after the last Ice Age.

In summer the coastal cliffs of the Rhinns Peninsula and the Ayrshire coast are splashed with pink thrift, white sea campion and golden yellow gorse. Cormorants, kittiwakes, guillemots and razorbills form raucous colonies. On stormy days, the Ailsa Craig gannets dive dramatically close to the shore. Puffins and black guillemots may be seen around the Mull of Galloway while in winter, red-throated divers, grebes and scaup gather in Loch Ryan.

The Solway Firth's mudflats and adjacent grasslands support 120,000 wintering wildfowl and waders, including the entire Svalbard population of barnacle geese from Spitzbergen, Norway. The sand and mud flats, saltmarsh and dunes provide rich feeding grounds and roosting sites and are a vital resting and wintering area for birds that migrate along the eastern Atlantic seaboard every year.

Environmental Trends

4.7 **Climate change** is regionally causing increased storminess, warmer and shorter winters, and more frequent droughts. That results in increased flooding, increased river and slope erosion, and a longer growing season for grass, trees and crops. Droughts are causing increased short-term pressure on water supplies. Winter rain is causing soil damage in areas where cattle are out-wintered. Water tanks and cattle sheds are being built.

4.8 **Sea level** rises are slowly affecting the region; the region will be affected worse than the rest of Scotland, but better than England. Higher tides and westerly storms will cause estuaries to expand inland: muddy inlets and soft coasts will erode, and low fields will become saline. This will result in changes to the areas of mudflats and merse, loss of farmland, especially along wet flat lands along the Solway estuary and inlets, and exacerbation of flooding at estuarine towns (Dumfries, Newton Stewart). Rocky coasts will be less affected. Increased storminess will result in storm damage to seawalls and piers (Ayr, Girvan, Cairnryan, Stranraer, Garlieston, Kirkcudbright). Increased salinity is unlikely to affect drinking water quality, since most of the region's water comes from upland lochs and springs.

4.9 **Fuel price** rises are causing the region to increase its energy self-sufficiency. Land use in the uplands is trending towards more production of timber energy (heat and electricity from forestry waste), hydro energy (electricity from existing reservoirs and new micro run-of-river systems), and wind energy (electricity from wind farms on hills). Open cast coal production is becoming economic in previously uneconomic locations. Most of the area is not served by gas pipelines, and wood is now cheaper as a fuel than oil. Petrochemical fertilisers have become more expensive. These trends may accelerate as oil prices rise.

4.10 **Ecosystems** are beginning to be valued according to the social/economic/environmental services they provide. For example, despite their intrinsic and biodiversity value, moors have long been seen as unproductive and even when drained and fertilised they do not produce much food. As a result, many moors have been converted to conifer forests, and some are now being used as sites for windfarms. However, moors are now becoming recognised as carbon stores (peat and organic soils store carbon which would otherwise be released as a greenhouse gas) and as flood protection (organic soils soak up water after heavy rain, helping reduce flooding). It is not clear whether this additional recognised value will remain intrinsic, or whether climate change policy (such as carbon offset payments) will result in moorlands having greater economic value.

4.11 **Food prices** are increasing. This should increase agricultural profitability (increased cereal, lamb, beef and dairy prices), but is being counterbalanced by higher fuel, bought-in feed and fertiliser costs. Silage making, tillage, spraying and harvesting will become comparatively expensive, leading to further polarisation between low intensity minimal-fuel farming (hill sheep, hill cattle) and high intensity farming (high input, high output).

BR Designation Benefits

Potential Additional Benefits of
Biosphere Reserve Designation on Environmental Assets

	Benefits of BR designation (environmental opportunities)	**Disadvantages of BR designation (weaknesses and threats to the environment)**
Core:	More ecological and climate research	None
Buffer:	Better use of natural resources – timber, water, wind Easier development of carbon offset zone? Better recreational planning	None
Transitional:	More sustainable development More appreciation of the core environment	Possible increase in house prices, increase in second homes, lack of affordable housing

4.12 Biosphere Reserve re-designation could help crystallize certain economic values. "Ecosystem services" such as flood management, biodiversity production, water filtration and oxygen production are provided free by the ecosystem. Environmental economists now recognise that ecosystem services have value, and should therefore be costed into regional finance models (often through taxes, laws, and incentives). A recent government report[1] valued the ecosystem functions of land such as the core area of the GSABR as being worth £1.3 million per hectare[2]. While many economists consider these arguments misleading, because the economic benefits cannot be realised by the local economy, others look to payments made by US cities to their hinterlands, and recognise that when ecosystem services are under threat or in short supply, their values can indeed be realised.

4.13 Given that the GSABR core is more than 10km x 10km, ie 10,000ha, the GSABR core area provides 'free' benefits worth more than £13,000 million, ie £13 billion per year. However most ecosystem services will continue to have the same value whether or not they are designated as a Biosphere Reserve. Furthermore, until ecosystem services are under threat, the price for 'free' ecosystem services need never be paid. Nevertheless, some services will be easier to quantify and the finance will be easier to crystallize if they are within a bio-geographical area like a Biosphere Reserve which is particularly the case for carbon trading.

[1] Office of the Deputy Prime Minister (2002) 'Valuing the external benefits of undeveloped land – a review of the literature'

[2] Rural afforested and amenity land, natural and semi-natural land, and wetland provides external benefits worth £1.3m per hectare; extensive agricultural land provides £0.6m per hectare, intensive agricultural land provides £0.02 per hectare.

Carbon Trading Benefits[3]

4.14 It is not yet clear how much carbon trading will affect rural economics. However, because it may be very significant, and because it may be critical to economically ring-fence high-environmental value areas such as Biosphere Reserves and National Parks, it is included in this section. Carbon trading is the system by which organisations wishing to produce greenhouse gases (measured as carbon dioxide equivalents, 'tonnes carbon') can buy permits from non-greenhouse gas producing initiatives.

4.15 Carbon trading occurs under both compliance schemes and voluntary programmes. The international compliance regime is often referred to as 'carbon credits', and voluntary schemes tend to be called 'carbon offsets'. Some analysts claim the carbon exchange will eventually become as big as the stock exchange, and that rural carbon offset can be worth more per hectare than European farm subsidies.

4.16 International carbon reduction regimes include the Kyoto Protocol and the European Union's Emissions Trading Scheme. This carbon market traded more than € 20 billion in 2006 and has become a substantial economic force. Voluntary offset markets operate outside the compliance markets and enable companies and individuals to purchase carbon offsets on a voluntary basis. The voluntary market is much smaller than the compliance market (€62 .6 million in 2006) and is also growing rapidly: it grew 200% between 2005 and 2006 [4].

4.17 Europe's emission trading scheme channels money from Europe's heaviest polluting factories and oil producers to carbon positive developments in the developing world. Beneficiaries need to prove that the money enables them to not emit carbon that would otherwise have been emitted. The scheme is obligatory, but only for the 'dirtiest' companies. The United States has two obligatory federal systems (but not yet a national one) as well as the voluntary Chicago Climate Exchange.

4.18 The voluntary offset market has been criticised for its lack of transparency, quality assurance and third-party standards, and as a result is fast improving[5] [6]. More than ten different standards are used globally. European voluntary offset programmes (such as the Clean Development Mechanism and the Gold Standard) usually invest in carbon-positive projects in Africa and Asia. DEFRA and the Forestry Commission are building confidence in trading credits. Rural areas are almost uniquely placed to benefit.

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[3] Please note interest – the author of this section is a trustee of the Crichton Carbon Centre, Dumfries.

[4] Kollmuss A, Zink H, Polycarp C, (for WWF by the Sotckholm Environment Institute) 2008: Making Sense of the Voluntary Carbon Market: A Comparison of Carbon Offset Standards

[5] The International Standards Office is currently developing and refining standards. ISO 14064 is an offset protocol . ISO 14065 was released in 2007 and spells out the requirements for greenhouse gas validation and verification bodies for project accreditation and emissions reductions verifications. ISO 14066 will outline how individuals can get accredited auditors and how auditors will be reviewed.

[6] Code of best practice for carbon offset providers
http://www.businesslink.gov.uk/bdotg/action/layer?r.l1=1079068363&r.l3=1079335745&topicId=1079068363&r.l2=1079363464&r.s=m

4.19 Most beneficiaries have been in the developing world because it is cheaper to offset carbon here, and more carbon can be offset for the same money. However, the Chicago Climate Exchange invests in regional carbon-beneficial projects, including renewables and extensive farming. Two-thirds of the offsets that entered the voluntary market in the US in 2006 came from managing land to soak up carbon, known as sequestration projects[7].

4.20 Some UK organisations, including the Scottish Forestry Alliance/Borders Forest Trust[8], and the Natural Trust for Scotland (conserving moorland on Arran) have set themselves up to receive voluntary carbon offset money and provide good carbon sequestration projects with several hundred hectares of new broadleaved woodland having been planted using these 'voluntary' donations.

4.21 Cream O' Galloway (the organic ice-cream company and visitor attraction, Gatehouse of Fleet) has received carbon offset finance in exchange for planting a wood that would not otherwise have been planted. The North West Climate Fund, set up by agencies from Cumbria to Cheshire, will receive carbon credits from regional companies and individuals and it plans to spend the money in NW England (e.g. managing the Pennine Moors for carbon) and in the developing world[9]. National Parks in England and Scotland are looking at ways in which they can receive carbon credits.

4.22 A Biosphere Reserve would be an ideal place for carbon offset. Voluntary carbon offset finance could be available for projects proven to trap carbon. Native wood planting, wetland creation, organic/very extensive farming, and moorland re-wetting (by blocking up the twentieth century drains, grips and ditches) are all proven to lock atmospheric carbon into the soil[10].

4.23 Any GSABR project to sink carbon and receive money would need to be monitored and regulated (to ensure project quality and longevity) by an approved scheme. Coal mining, coal power stations and coalfield restoration companies might pay for local peatlands to be managed better for carbon. Links could be developed with the Cumnock and Doon Valley Minerals Trust, or with local carbon emitting businesses such as Prestwick Airport. An international designation (such as BR) might also attract investment from distant organisations and individuals keen to invest in a globally important environment.

[7] Kollmuss A, Zink H, Polycarp C 2008 (ibid)
[8] Edinburgh Centre for Carbon Management http://www.eccm.uk.com/)
[9] http://www.moorsforthefuture.org.uk/mftf/research/Carbon.htm

[10] The amount of carbon sequestered by forests depends upon tree age, growth rate, local climate, and soil quality. Clear felling causes disturbed soils and decomposing debris to emit large quantities of carbon. Planting trees on arable/mineral soils locks up carbon. Draining/ drying peaty soils (like in the GSABR) to plant trees or improve farming causes carbon emissions, although the trees themselves will lock up carbon. Minimal drainage and permanent broad-leaved woodlands would be most carbon efficient. In ponds and lochs, algae locks the carbon and settles it into the mud. Projects that protect and enhance existing old woods and wetlands will provide the greatest carbon mitigation benefits

4.24 Evaluating the possible value of carbon sequestration in the GSABR is difficult because the science is young, there are many variables, and the statistics are "noisy". Un-harvested native woods sequester 2 tonnes carbon per hectare per year in the timber, the litter, and the soil. A commercial forest (averaging from planting to harvest) accumulates 3 tonnes carbon per hectare per year[11] in the timber - which is then harvested. Scottish moors in good condition can sequester 1-4 tonnes carbon per hectare per year[12].

4.25 Applying a carbon value of £15 per tonne, forestry stores £2,100 worth of carbon per hectare. The GSABR's 76,000 hectares of publicly owned forest therefore contains £160m worth of carbon. Whether this value could be realizable depends on whether or not the carbon is considered additional. Additionality is the key to how could the GSABR sequester additional carbon and there are two obvious methods:

- Moorland restoration: in the Peak District, it was estimated that blocking grips/ditches/gullies on the moors (to re-wet the peat and reduce erosion and flooding) would sequester an additional 1 tonne/ha/yr[13]. Prof Pete Smith (Aberdeen University, carbon soil scientist member of IPCC) suggests that organic soil restoration can sequester up to 60 tonnes CO2/ha/yr. This is exactly the type of work which could be done in the core of the GSABR, and which would have the additional benefits of improving fish biodiversity and angling revenue.

- Woodland conversion: the best way of conferring additionality would be to convert harvested forest into un-harvested forest, i.e. in some areas, once sitka spruce has been harvested, replant with native trees such as oak, birch and willow. Such new woods attract carbon rights payments of about £800 per hectare[14]. Such a conversion, if carried out along the tributaries and ditches in the headwaters of salmon rivers, would also provide biodiversity and economic benefits.

[11] http://www.hm-treasury.gov.uk/media/E/E/climate_change__forestry.pdf - The Forestry Commission (2005). The maximum potential for carbon accumulation in 100 year old woodland is approximately 200 tonnes of carbon per hectare. Commercially managed stands can be expected to accumulate an average of approximately 100 tonnes of carbon per hectare during their 30 year lifetime.

[12] Moors for the Future suggest best case scenario18.9 tonnes CO2 fixed/km2 (i.e. 0.189 tonnes/ha/yr) (max 35±12.6 tonnes/km2/yr), worse case 7 tonnes/km2 lost (max 100 tonnes/km2 lost following wildfires); Prof Pete Smith (2007, at Moors for the Future Conference) suggests a range of values for Scottish peats from 0-7 tonnes CO2/ha/yr, averaging 4 tonnes.

[13] University of Durham calculated a range 64-135 tonnes carbon/km2/year

[14] this is a one-off payment payable by the carbon broker at planting, and subject to several additionality checks and conditions.

Price of carbon?
New woods in Scotland attract one-off carbon rights payments in the range £600-£1000 per hectare. WWF suggest that voluntary offsets are worth 10-20 € per tonne CO2, and assumes 30 year lifespan projects[15]. The Forestry Commission notes that the value of carbon offsets climbed from £6 to £20 in the past 5 years, (although offset carbon's 'real' value to society is considered to be more like £70/tonne) [16]. DEFRA accept a shadow price of carbon at £25/tonne[17]. For this study, we therefore use a carbon offset value of £15 as being an average price being paid for voluntary carbon offsets in the UK, and/or a one-off figure of £800 per hectare for new woods.

4.26 This study recognises that designating a Biosphere Reserve will not mean that the whole area will immediately benefit from carbon payments. However, moorlands will miss out from the carbon economy if they are marginalised. Large-scale carbon trading should be easier if the carbon-rich peat, soils and forests of a geographical region can be ring-fenced, and if there is incentive for research and action into improving carbon sequestration in those areas. A Biosphere Reserve (or a National Park, or a Forestry Commission/Moorland partnership) could encourage this, and should prosper if the carbon economy develops.

[15] Kollmuss A, Zink H, Polycarp C, (for WWF by the Sotckholm Environment Institute) 2008: Making Sense of the Voluntary Carbon Market: A Comparison of Carbon Offset Standards
[16] Stern Review on Economics of Climate Change – Response from the Forestry Commission 8 December 2005 http://www.hm-treasury.gov.uk/media/E/E/climate_change__forestry.pdf
[17] www.sac.ac.uk - Scottish Agricultural College Farm Business News May 2008

5.0 SOCIO-ECONOMY

Economic Structure

5.1 The proposed, re-designated GSABR comprises a large rural area of about 6,500 sq kms composed of parts of the three council areas, in alphabetical order, Dumfries and Galloway, East Ayrshire and South Ayrshire. This triple, trans-council area makes it difficult to obtain accurate, consistent data without undertaking significant research and/or making some assumptions.

5.2 One of the main sources of disaggregated information, although much of it seems very dated for analytical and monitoring purposes, is the Scottish Neighbourhood Statistics (SNS), which provides some economic and social data at council ward level and "data zone" level and which has been used to estimate baselines.

5.3 The outer boundary of the transition area was stated as being a minimum boundary with "fuzziness" attributed to it but for the purposes of this study it was indicated initially by the Steering Group that the GSABR covered 35 wards, excluding the two main towns of Ayr and Dumfries.

5.4 The three wards of Cumnock West, Cumnock East and Auchinleck are also important to include because of Dumfries House and Knockroon Farm being strongly associated with the GSABR. The core area and buffer zone of the GSABR are assumed to be within the wards of Creetown, Gatehouse of Fleet, Glentrool, Glenkens and Dalmellington, although they may not coincide exactly with the Galloway Forest Park.

5.5 For the original 35 wards of the GSABR, the SNS shows a population at the 2001 census of 115,158. Two of the wards are only partly in the transition area, so the population can be adjusted downwards to around 113,000. If Cumnock West, Cumnock East and Auchinleck (with a combined population of 10,783) are included in the transition area, then the population of the GSABR was almost 124,000.

5.6 However the adjoining ward of Ochiltree, Skares, Netherurd and Cragens also needs to be included to geographically link the other three wards to the original GSABR wards. It has a population of 3,750, so therefore the total estimated GSABR population at the 2001 census was 127,500.

5.7 The GROS populations of Dumfries and Galloway, East Ayrshire and South Ayrshire at the 2001 census were 147,780, 120,310 and 112,160 respectively, giving a total of 380,250. Therefore the GSABR accounted for 34% or about one third of the population of the three local authority areas. Although historical, this proportion and other proportions have been applied as a proxy to generate information for the GSABR area from local authority data.

5.8 By mid 2006 the population of Dumfries and Galloway had increased very slightly to 148,030 whilst the populations of East Ayrshire and South Ayrshire had decreased slightly to 119,290 and 111,670 respectively, totalling 378,990, which is overall a slight decrease, with all populations ageing.

5.9 The latest GROS population projections for the next 10 years for Dumfries and Galloway, East Ayrshire and South Ayrshire are 147,578, 117,950 and 111,717. The population is projected to decrease slightly in Dumfries and Galloway, to decrease by 1% in East Ayrshire and to be stable in South Ayrshire. The population of Scotland as a whole is projected to increase over the next 10 years from 5,157,069 to 5,294,260, or by over 2.5%.

5.10 The two main descriptors of economic structure are employment and output. The unemployment rates in Dumfries and Galloway, East Ayrshire and South Ayrshire in November 2008 were 2.8%, 4.1% and 3.1% respectively, compared with 2.8% for Scotland. Because of the rundown of coal mining in the 1980s, there remain unemployment black spots in East Ayrshire, particularly in Dalmellington, New Cumnock and Patna.

5.11 Of Scotland's 32 local authorities, unemployment in East Ayrshire was the 5th highest, in South Ayrshire the 10th highest and in Dumfries and Galloway the 13th highest. Unemployment in Dumfries and Galloway at 2.8% was the same as the Scottish average. These rankings can change a little from month to month but the above ones are representative of the recent past.

5.12 It is not possible to obtain unemployment statistics just for the GBASR area but those above suggest that the level of unemployment is probably a little higher than the national average.

5.13 The Office for National Statistics (ONS) undertakes an Annual Survey of Hours and Earnings (ASHE), which produces statistics for every local authority area in the country, by both place of work and place of residence. There can be significant differences because of commuting, particularly in and around the cities such as Glasgow and Edinburgh.

5.14 In 2007 average gross weekly earnings by place of work in East Ayrshire were £388.50, in South Ayrshire £406.80 and in Dumfries and Galloway £388.80. All those figures were below the Scottish average of £426.0, which should not be surprising given the rural nature of the areas.

5.15 It is not possible to produce earnings statistics for just the GSABR area but the average is likely to be lower than the Dumfries and Galloway average, again because of the rural nature of the local economy. Agriculture and tourism are normally low earnings industries.

5.16 By place of residence, the average gross weekly earnings in East Ayrshire were £417.40, in South Ayrshire £452.40 and in Dumfries and Galloway £391.30. The Scottish average was £424.1. The relatively high figure for South Ayrshire must reflect commuting patterns.

5.17 Mention should also be made of the Scottish indices of multiple deprivation (SIMD). Considering the local shares of data zones in 2006 in the most deprived data zones, in East Ayrshire the local share was 26.0%, in South Ayrshire was 14.3% and in Dumfries and Galloway 8.3%. The worst area of Scotland was Glasgow City, where the local share was 53.5%.

5.18 The outputs of the economies of the three local authority areas included in the GSABR can be summarised and described, with the baseline economy of the GSABR being estimated by applying proportions of % of population to each local economy and then aggregating them. Whilst this methodology has defects, in the time available it can provide an acceptable proxy of the GSABR economy.

5.19 In order to assess the overall impact of the additionality of the GSABR, the population proportions applied to the economies of each local authority area provide estimates of the economic characteristics of its part of the GSABR, those proportions being 63% for Dumfries and Galloway; 20% for East Ayrshire; and 17% for South Ayrshire. According to the Analytical Services Division of the Scottish Government, in Dumfries and Galloway of the working population of 86,000 there are 70,000 people economically active, with 67,000 people actually employed. In East Ayrshire, of the working population of 74,000 there are 57,000 people economically active, with 53,000 people actually employed. In South Ayrshire, of the working population of 66,000 there are 54,000 people economically active, with 52,000 people actually employed.

5.20 Therefore in the GSABR area it is assumed that there are about 64,700 people economically active and over 61,600 actually employed, including 42,200 in Dumfries and Galloway, 10,600 in East Ayrshire and 8,800 in South Ayrshire. Of the 61,600 people employed in the GSABR area, about 8,300 or over 13% are estimated as being self employed, including in Dumfries and Galloway 6,300, East Ayrshire 1,000 and South Ayrshire 1,000.

5.21 It is also estimated that there are over 5,200 small businesses in the GSABR area, including about 4,100 in the Dumfries and Galloway part, over 570 small businesses in the East Ayrshire part and almost 570 in the South Ayrshire part.

5.22 Table 5.1 gives a breakdown of employment by sector and industry in each of the three local authority areas. As usual, public administration is the largest employer in the local economy, followed by the retail/wholesale/hotels sector, which includes tourism. This sector is much smaller in East Ayrshire than in the other two areas but it is estimated that across South West Scotland about 7% of employment is in tourism. In Dumfries and Galloway, the manufacturing and primary sectors are both more important than in the other two areas.

5.23 It has also been noted about the dominance of the self-employed and small business sector in Dumfries and Galloway. Since 1999 in Dumfries and Galloway there have been decreases in employment in every sector except the public sector, in East Ayrshire there have been decreases in employment in the primary and manufacturing sectors and in South Ayrshire there have been decreases in the manufacturing and finance sectors.

Table 5.1: Employment by sector, 2006

Sectors by "employee jobs"	**Dumfries & Galloway Council Area**		**East Ayrshire Council Area**		**South Ayrshire Council Area**	
	000s	%	000s	%	000s	%
Primary Industries	3.5	6.0%	0.8	2.0%	0.8	2.0%
Energy & Water	0.7	1.0%	0.8	2.0%	n/a	1 ?%
Manufacturing	7.5	13.0%	4.5	11.0%	5.3	11.0%
Construction	3.3	6.0%	2.7	7.0%	n/a	3 ?%
Retail/W/sale/Hotels	14.7	25.0%	8.9	22.0%	13.9	29.0%
Transport/Comm.	2.9	5.0%	1.4	4.0%	3.0	6.0%
Finance/Business	4.3	7.0%	4.5	11.0%	3.4	7.0%
Public Admin.	20.9	36.0%	16.1	40.0%	19.2	40.0%
Total	**57.7**	**100%**	**40.0**	**100%**	**47.5**	**100%**

5.24 If the same %s for the sectors in each local authority area are averaged and applied to the estimated 61,600 jobs in the GSABR area (including 42,200 in Dumfries and Galloway, 10,600 in East Ayrshire and 8,800 in South Ayrshire), then the economic contribution to or economic structure of the potential GSABR area can be estimated (with rounding errors) as: primary industries 3.3% or 2,000 jobs; energy and water 1.3% or 800 jobs; manufacturing 11.7% or 7,200 jobs; construction 5.3% or 3,300 jobs; retail/hotels 25.3% or 15,600 jobs; transport 5.0% or 3,000 jobs; finance 8.3% or 5,100 jobs; and public sector 38.7% or 23,800 jobs.

5.25 Mackay Consultants produce annual estimates of economic output (as measured by gross domestic product, GDP) for each of the 32 local authority areas in Scotland. The 2006 estimates are shown in Table 5.2 below. The total GDP of the GSABR area can be estimated from these figures in 2006 as approximately £2.0 billion, comprising GSABR Dumfries and Galloway £1,249 million, GSABR East Ayrshire £361 million and GSABR South Ayrshire £379 million.

Table 5.2: GDP and other key indicators

	Dumfries & Galloway		**East Ayrshire**		**South Ayrshire**	
	LA Area	Est GSABR	LA Area	est GSABR	LA Area	est GSABR
GDP, 2006	£2,314 m	£1,249 m	£1,673	£361 m	£1,921 m	£379 m
Population	148,030	79,907	119,290	25,739	111,670	22,045
GDP/person	£15,632	£15,632	£14,025	£14,025	£17,202	£17,202
GWE, 2007						
work	£388.80		£388.50		£406.80	
residence	£391.30		£417.40		£452.40	
GWE Scotland						
work	£426.00		£426.00		£426.00	
residence	£424.00		£424.00		£424.00	

5.26 On the assumption that the GSABR would begin operations in 2010, we need to project the 2006 GDP estimates forward to 2010. Mackay Consultants also produce annual forecasts of economic output for local authority areas and the same forecasts can be applied to the GSABR area.

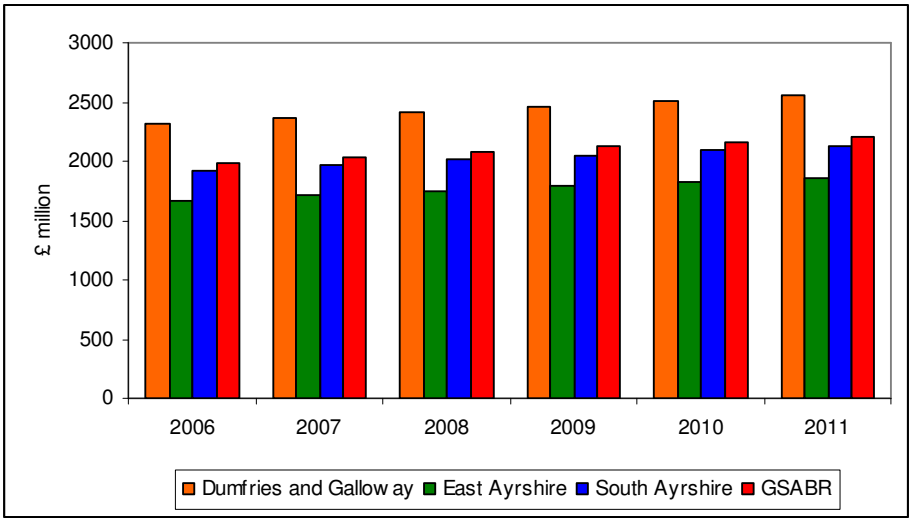
5.27 However, the latest forecasts were made in 2007 before the full effects of the current economic and financial crisis were clear. New forecasts will be made in early 2009, which will inevitably be much lower than the last ones. Nevertheless, that is not significant in the context of this analysis because our main focus is the **incremental impact** of the biosphere reserve designation.

5.28 Table 5.3 shows that, assuming the same forecast rates as for the local authority areas, the area economic output for the GSABR would increase to £2,161 million by 2010, which can be regarded as the baseline output if the GSABR starts in that year. The calculations are also illustrated in Figure 5.1.

Table 5.3: Forecast GDP of Council Areas and GSABR Area, 2006-2011

	GDP D&G		GDP E Ayrshire		GDP S Ayrshire		GDP GSABR	
Year	**£m**	**%**	**£m**	**%**	**£m**	**%**	**£m**	**%**
2006	2,314		1,673		1,921		1,989	
2007	2,368	2.3	1,713	2.4	1,967	2.4	2,037	2.4
2008	2,419	2.2	1,751	2.2	2,011	2.2	2,082	2.2
2009	2,468	2.0	1,786	2.0	2,051	2.0	2,123	2.0
2010	2,515	1.9	1,819	1.8	2,088	1.8	**2,161**	1.8
2011	2,560	1.8	1,852	1.8	2,126	1.8	2,200	1.8

Figure 5.1: Forecast GDP of Council Areas and GSABR Area, 2006-2011



5.29 The GSABR area has been characterised by estimated baseline indicators as an area with a population of 127,500, of whom 64,700 are economically active and 61,600 are employed, including 8,300 self employed and 5,200 small businesses. There are an estimated 23,800 jobs in the public sector but that is probably an over-estimate because some urban areas are excluded, 15,600 jobs in the retail/wholesale/hotels sector, of which it is estimated that 5,200 jobs are in tourism, and 2,000 jobs in the primary sectors, which is probably an under-estimate. There was an estimated GSABR area GDP of £1,989 million in 2006, which is forecast to increase to £2,111- £2,161 million by 2010, depending on assumed growth.

Key Sectors and Assets

5.30 Applying this framework, we have identified or focused on key sectors or activities or assets which it appears will provide the best opportunities for additional impacts, without substitution or displacement, compared with those benefits which are already accruing or will develop from a wide range of existing initiatives. Identifying and evaluating this additionality or synergy has been the most challenging part of this study because there was no existing strategy or programme and therefore an outline strategy was required to be developed both to identify the potential of the benefits of the GSABR and to facilitate our consultations with a range of interests.

5.31 In the framework, following discussion with consultees, scoring was undertaken, rankings were made and weighted, and opportunities were identified. The top 50%/75% of rankings and the bottom 50%/25% of rankings were classified using this approach.

5.32 Some of the tourism sub-sectors were discounted because of a lack of sufficient additionality. For example, golfing is already well developed and the markets are well serviced, and therefore the Biosphere Reserve would not provide much additional boost.

5.33 Sectors and sub-sectors offering less additionality from a Biosphere Reserve included mainstream agriculture, forestry, timber, retailing, manufacturing, parts of the social economy including housing and transport and parts of the environmental economy.

5.34 The key sectors or activities or assets likely to benefit from a Biosphere Reserve are those which survived the matrix analysis within the framework, specifically: tourism, angling, arts and crafts, renewable energy, small and medium-sized enterprises (SME), local food, education/recreation, nature conservation and carbon trading. Some of these can be quantified specifically for additionality or synergy, particularly the economic activities, whilst others are more difficult to quantify, such as the social activities. It is believed the portfolio of sectors/activities suggested provides direct benefits and shows clear additionally for the GSABR from its suggested components.

5.35 Following consideration of this study by the Steering Group, other sectors, activities and assets can be added, tested, amended or deleted from the framework, which is designed to be used for this review purpose by the promoting organisations. The GSABR sectors and activities are derived from the GSABR key assets and are activated by the GSABR components, as summarised in Table 5.4 below..

Table 5.4: GSABR Targeted Sectors and Key Assets

Targeted Sectors/Activities	**GSABR Key Assets**
Economic	
Tourism/Accommodation	Visitor Attractions: expanding range of attractions
Angling Tourism	Rivers Potential: future increase in angling activities
Arts & Crafts	Local Initiatives: many existing marketing projects
Renewables	Rural Economy: linked to tourism and food industry
Small SMEs	SMEs Growth: large sector and potential to develop
Local Food	Area's Towns: centres of socio-economic activities
Social	
Education & Recreation	Community Initiatives: existing community projects
Local Volunteering	Community Participation: strong community spirit
Environmental	
Nature Conservation	Environmental Biodiversity: existing/future projects
Carbon Trading	Wetland/Flood Management: potential opportunities

5.36 The GSABR components which indicated the best potential were identified as the priorities:

- **Global status** of UNESCO re-designation, increasing market profile, more tourists
- New, linked, interactive **GSABR website**, promoting the GSABR and opportunities
- Access to **funding sources** for tourism, angling, arts & crafts, renewables and food
- Pilot eco-SMEs **start-up fund** which would become self-funding and be developed
- Importance of undertaking **research and development** opportunities in buffer zone
- Provision of environmental **business eco-advice** with cost savings/increased sales
- Provision of environmental **training for individuals** from awareness to vocational
- Meet-the buyer, **business co-operation events**, with local sales and less "food " miles
- Establishment of **GSABR networks** for communities in rural areas to "exchange"
- Consideration of **GSABR gateway centres**, but very expensive and longer term
- Hosting larger Biosphere-related **international events** every few years in the GSABR
- Establishment of GSABR clubs mainly in towns, promoting **education & recreation**
- **System of signage** throughout the GSABR to direct/retain visitors in the area.

5.37 It should be noted that eco-labelling and accreditation are not included, at least initially, as priority components of the GSABR for the reasons stated previously and subsequently. However, for marketing purposes and awareness raising, the GSABR will require a name and a logo which can be used throughout the area and be placed in information points for promotional purposes, without it being an expensive branded or accredited scheme.

5.38 Clearly the "Galloway and South Ayrshire Biosphere Reserve" is not an appropriate name for marketing. The eventual name, tag-line[18] and logo need to be properly explored, professionally reviewed, and market tested; perhaps that could be done by competition. Because of Scotland's international reputation as a country and a destination, we recommend that the name should have a strong Scottish flavour, ideally including the words Scottish or Scotland.

5.39 One suggestion was "Green-Heart Scotland"; other suggestions included "The Loch District", or names based on forest or moor. The words "Galloway" and/or "Ayrshire" provide regional focus and marketing opportunities, although they are less known internationally. Any branding should confer authenticity and rurality. Some consultees also suggested linking the area's cultural aspects to the GSABR, whatever it is named, including historical figures such as Robert Burns or Robert the Bruce.

5.40 In addition the GSABR may wish to identify ambassadors, including a high profile ambassador or even a future GSABR chairman. Someone who has expressed an interest in the GSABR and who has already invested heavily in the area is The Prince of Wales or, titled correctly in Scotland, The Duke of Rothesay.

[18] Braunton Burrows tags itself "North Devon's Biosphere Reserve: World class by nature". However, this does not give much information about the character of the place.

Baseline Indicators

5.41 Macro baseline indicators for the GSABR of economic output and employment have already been suggested, along with public funding leverage, and it is now required to consider similar sectoral baseline indicators to quantify and monitor the suggested GSABR components, which it is recommended could be applied successfully to the GSABR sectors or activities. From the framework, the priority GSABR components suggest a range of quantifiable impacts, some of the proposed components being well tested and some being quite innovative. These are summarised in Table 5.5.

Table 5.5: GSABR Sectors, Components, Baselines/Impacts

Sectors/activities	GSABR components	Baselines/impacts
Tourism: visitor attractions	International marketing status	£exp/£GVA/no. of jobs
Tourism: accommodation	International marketing status	£exp/£GVA/no. of jobs
Tourism, local, other benefits	Interactive, linked, website	No. of hits by sectors/enquiries
Tourism: angling	Funds for river improvements	£exp/£GVA/no. of jobs
Nature Conservation	Advice, training, r & d projects	No. of jobs/projects
Arts & Crafts	Marketing and funding opps	£exp/£GVA/in tourism
Small Businesses	Start-up loan fund for eco-SMEs	No. of SMEs/£GVA/no. of jobs
Small/Other Businesses	Environmental eco-advice	No. of projects/£saved
Renewable Energy	Timber and hydro schemes	No. of SMEs/£GVA/no. of jobs
Food & Drink	GSABR marketing status	£exp/£GVA/in tourism
Food & Drink	"Meet the Buyer" local events	£sales/£GVA
Research & Development	Research projects and facilities	No. of projects/£exp
Community Projects	GSABR clubs and networks	No. of projects/members
Environmental Projects	Carbon Trading	£carbon offset sales

Outline Strategy/Action Plan

5.42 An outline strategy and/or action plan in the time available can only be suggested and it would require to be discussed more and developed further by the promoting organisations and local communities. The primary aim is stated as "developing the GSABR as a model region for sustainable community planning and economic development". If approved, it could be the only re-designated Biosphere Reserve in Scotland and it should be promoted as such for Scottish Government support.

5.43 An outline strategy requires a number of key objectives and a related action plan. The framework has provided some good indicators, although not definitive proposals, for a strategy and plan which did not exist previously. When developed further by the Steering Group and its constituent members, each objective and action should be identified by its relationship to the core area, the buffer zone and the transition area.

5.44 There has also been discussion regarding the various models of governance and management of the GSABR and the study was asked to provide a view on this aspect. This is an appropriate point to give an opinion because vigorous governance and effective management are required to implement a strategy and to action a plan. This opinion is based on our extensive experience of project management and, whilst it may not be accepted by some members of the Steering Group, it should be recognised as providing a basis which did not exist previously for further discussion.

5.45 Clearly the promoting organisations including local authorities would require to form a Policy and Management Committee. It would be important to include or co-opt representatives from local communities and the private sector because it is local stakeholders who will ultimately respond to and benefit from the GSABR. It is the private sector and local businesses which will "make or break" the GSABR and therefore communication with and participation of the private sector, in jargon "engagement", is vital for success.

5.46 We do not believe that the GSABR should be managed operationally by existing public organisations or use existing staff, nor that this approach would necessarily save money. In our opinion that would not do justice to the GSABR, and it would be unlikely to provide required clarity and it might confuse the stakeholders in business and communities. However, support from the public sector is essential for its successful implementation and there must be clear lines of communication established and nurtured amongst the public sector to achieve the potential of synergy.

5.47 There are also related organisations with whom partnerships would be formed and there are other organisations, such as the Southern Uplands Partnership and East Ayrshire Woodlands, which could initially contribute to the management, with SUP in particular and other initiatives eventually becoming key partners in the GSABR.

5.48 An effective management team responsible to the Policy and Management Committee requires to be established quickly at a reasonable budget and we would recommend that initially it comprises three staff, a small office and a marketing budget. The team must promote a sense of pride in the GSABR and make it synonymous with quality and, along with appropriate professional skills, must be excellent communicators particularly with the private sector.

5.49 The core budget should be about £250,000 per year (py), provided by the promoting organisations but that could be offset or increased by, for example, Scottish Government and/or ERDF funding. The staff costs would be about £130,000 py, the office costs £20,000 y and the marketing budget £100,000, including a quality, interactive, linked website at £10-15,000.

5.50 Some members of the Steering Committee told us that it will be very difficult to establish such an organisation in the present financial climate for local authorities. We understand that and accept that other arrangements may be necessary in the short run.

Suggested Objectives

1. Improving the biodiversity of the GSABR
2. Promoting sustainable development of the GSABR
3. Maximising the opportunities for growth and employment
4. Ensuring the inclusion and participation of all stakeholders
5. Contributing positively to the issues relating to climate change
6. Being a strong, healthy community, promoting recreation and education

Outline Strategy

1. Target priority sectors which will provide the greatest, tangible, quality impacts
2. These priority sectors can be sub-divided into economic, social and environmental
3. Economic sectors are tourism, angling, arts & crafts, renewables, SMEs and food
4. Social sectors through local communities are education, recreation and volunteering
5. Environmental sectors are in carbon trading activities and nature conservation work
6. The GSABR can provide additionality and profile to these sectors through its actions

Action Plan

1. Capitalise on marketing opportunities of GSABR status for tourism, arts&crafts, food
2. Establish and manage a new, interactive GSABR website, linked to other websites
3. Develop programmes and source funding for river improvements to maximise angling
4. Advise, train, research and develop nature conservation & carbon sinks in buffer zone
5. Establish and manage a pilot start-up recycling loans fund for eco-"approved" SMEs
6. Enhance the existing environmental business advice to save costs and increase sales
7. Promote opportunities for rural renewable energy projects using timber and hydro
8. Arrange "meet the buyer"/business co-operation events to improve local buying
9. Develop networking opportunities, particularly rural areas, through local initiatives
10. Establish GSABR town clubs to deliver educational projects/community recreation
11. Utilise many, local information points for distributing GSABR brochures/information
12. Future review of GSABR gateways, larger events, eco-labelling, eco-accreditation.

6.0 BENEFITS

Key Opportunities

6.1 The key opportunities emerging from this study - namely tourism, angling, arts and crafts, renewables, SMEs, local food, education/recreation, nature conservation, and carbon trading - can be converted into tangible projects for the GSABR to initiate in its early years, with impacts assumed up to or in the following 10 years. These key opportunities have been selected for their potential tangibility and likely additionality to existing initiatives, activities and markets, and so that they do not obviously substitute or displace but enhance existing and other activities in the area. Other opportunities are bound to arise in time and most impacts would also extend beyond 10 years.

6.2 It is very difficult to forecasts these impacts. With the agreement of the Steering Group for the study, we have therefore used a conventional scenario approach with three scenarios:

- **base case**
- **optimistic case**
- **pessimistic case.**

Funding

6.3 The Steering Group identified, as others have, that the GSABR would provide access to funding and the recognition of this opportunity was also mentioned by consultees. It was therefore included in the framework as a component of the GSABR, although of course neither UNESCO nor the GSABR provide funding directly.

6.4 Clearly, it is anticipated but not certain that the GSABR will provide access to funding. Indeed it is obvious that GSABR projects could not proceed without such funding. In discussion with all the main funding sources, it seems likely that in a competitive situation for these funds, if GSABR projects were quality applications, they would likely be approved for funding.

6.5 The main sources of public funding which are relevant to the GSABR have all been consulted and have responded positively to the potential of the GSABR, providing good projects. These sources are well known and are all now running until 2013, notably: the ERDF Programme known as the Lowlands and Uplands Programmes Scotland (LUPS), which has global grants and challenge funds managed by ESEP Ltd; the Scottish Rural Development Plan (SRDP), with separate programmes for Dumfries and Galloway and Ayrshire; the separate Leader Programmes; and the Interreg IVA Trans-border Co-operation Programme. All of these programmes, through their priorities, are ideally placed to provide significant funding for GSABR projects, with the Biosphere Reserve being included specifically in the Ayrshire SRDP.

6.6 Match funding is required for all these Programmes, LUPS only from the public sector and SRDP mainly from the private sector, with the intervention rate normally being 40%. Interestingly for Interreg IVA it is 75% and with LUPS there is also a 10% variance or flexibility for border projects straddling the LUPS boundary.

6.7 With this range of funding available, particularly for rural development, there is also the potential for funding being duplicated but that would be monitored carefully by Programme managers. If GSABR projects are funded from these sources, it is of course difficult to attribute such funding as being additional. If the funding is ring-fenced for the area and bids are competitive and if funds are not used for GSABR projects they will be allocated to other projects in the area. Therefore there would be no or little additionality.

6.8 However, as Programme managers have expressed, GSABR projects may be better quality and receive funding in a competitive situation or possibly by negotiating ring-fenced funding and therefore produce better impacts which are clearly additional themselves but not the funding sources which could be regarded as being neutral. Co-match funders often claim additionality or at least leverage when reporting on projects but this approach does not account for displacement, with only the additional impacts or outcomes being truly additional.

6.9 This situation will be the same for the GSABR, although some additionality of funding could be claimed legitimately if its projects attract funds which otherwise would have been vired or, in the case of Interreg IVA, additionality could be claimed for the GSABR area because otherwise that funding may have gone elsewhere. Because of limited time, it was not possible to work up an Interreg project and therefore not possible to speculate about such funding.

6.10 Therefore, in this study the additionality of funding has been assumed as being largely neutral or included in or accounted for by the impacts of the following suggested GSABR projects, rather than miscounting or double counting funding itself as being additional. Nevertheless, the promoting organisations will require to consider their budgetary priorities for co-funding GSABR projects in relation to their own or other projects, whilst potential developer contributions such as wind farm contributions will also require to be identified.

6.11 Promoting organisations may require to be prepared to identify a certain amount of match funding or establish a structured mechanism for considering funding for GSABR projects from 2010 onwards. It is difficult in this study to identify the amounts of match funding or co-funding until GSABR projects are proposed in more detail but some indications are provided later and public agencies should be planning ahead for this eventuality starting in 2010.

Economic Benefits

Tourism

6.12 The latest tourism statistics available from Visit Scotland for Dumfries and Galloway and Ayrshire are for 2006. It is estimated that in 2006 UK residents took 920,000 tourist trips and overseas visitors 60,000 tourist trips to Dumfries and Galloway, involving 3.4 million bednights and expenditure in the area of £167 million. It is also estimated that in 2006 UK residents took 800,000 tourist trips and overseas visitors 17,000 trips to Ayrshire and Arran, involving 3.7 million bednights and expenditure in the area of £204 million.

6.13 The statistics also show that in 2006 tourism-related employment in Dumfries and Galloway was 6,700 or 11.5% of the workforce and in Ayrshire and Arran 14,200 or 11% of the workforce. The equivalent figure for Scotland as a whole was 9.2% of the workforce, so the industry is an important part of the local economy. It was estimated previously that the tourism-related employment of the GSABR area was about 5,200 or 25% of the combined total tourism-related employment of 20,900.

6.14 UK tourist expenditure in Scotland is typically 30% on accommodation, 23% on travel in UK, 19% on eating/drinking, 10% on general shopping, 6% on buying clothes, 6% on packages/tours, 5% on entertainment, and 1% other. UK holiday trips in Scotland overall comprise 50% walking, 23% visitor attractions, 16% shopping, 14% sightseeing, 9% wildlife watching, 8% performing arts, 5% adventure sports, 4% fishing, 3% golfing, and 3% cycling.

6.15 The percentages of tourist expenditure on activities are differently distributed for overseas visitors in Scotland but the information quoted for UK visitors in Scotland provide a reasonable indication of expenditure and activities, with UK tourists in 2006 comprising 83% of trips and 66% of expenditure.

6.16 In Dumfries and Galloway the most popular visitor attraction in 2007 was the Old Blacksmith's Shop at Gretna Green with 717,400 visitors, followed by Mabie Farm Park, Cream O' Galloway, Threave Castle Gardens and the Gracefield Arts Centre. The Galloway Forest Park figures are recorded separately for each visitor centre, which together total 167,000 visitors and would make it one of the top attractions. In Ayrshire and Arran the most popular visitor attraction in 2007 was the Burns National Heritage Park, Ayr with almost 302,900 visitors, and the next most popular were Dean Castle Country Park, Culzean Castle Country Park, Heads of Ayr Park and Kelburn Castle Country Centre.

6.17 In the GSABR area in 2007 the top 10 visitor attractions were Culzean Castle Country Park (190,423), Cream of Galloway (70,900), Threave Garden (59,949), Forest of Ae (50,000 est), Clatteringshaws Visitor Centre (48,644), Glentrool Visitor Centre (36,629), Caerlaverock Castle (35,251), Gem Rock Museum (31,931), Galloway Wildlife Park (30,407) and Tolbooth Arts Centre (27,378). Culzean Castle Country Park in South Ayrshire is by far the most popular and all the other attractions are in Dumfries and Galloway. The new tourist attraction at Dumfries House, and the possibility of linking that with Culzean Castle, Craigengillan and Drumlanrig Castle, including their estates and food products, may provide future growth.

6.18 It was estimated previously that the tourism employment of the GSABR area was about 25% of the Dumfries and Galloway and Ayrshire and Arran total. As a proxy, therefore, it is assumed that the GSABR had 25% of the tourism output in 2006, which implies about 450,000 tourist trips, £93 million expenditure and over 5,200 jobs. In our consultations with tourism and related businesses in the area, it was concluded that by marketing the international designation of the GSABR area and by investing appropriately in infrastructure and interpretation, tourism could increase, particularly from its low profile internationally.

6.19 It is very difficult to predict what the increase in tourism activity will be. The range of possible increase discussed was between 1% and 5% per year, which is a similar range identified by both the Eden Project and Entebuch Biosphere. In the calculations which follow we have assumed annual growth in tourism activity of 1%, 2% and 3%.

6.20 Tourism actually declined in Scotland between 2005 and 2006 and it is difficult under the present market circumstances and domestic conditions to forecast with much certainty, but if, for example, the optimistic 3% py is applied to the 2006 figures, then the GSABR could annually generate an additional 13,500 tourist trips and £2.8 million expenditure. Those are equivalent to a £1.4 million increase in economic output (GVA) and 155 jobs (full-time equivalents, FTE).

6.21 Under present circumstances that rate may be too optimistic, but applied to a 2010 base without allowing for growth or inflation it is less optimistic. By comparison, Interreg IVA is targeting a 10% increase for each April-September period and a 5% increase for each October-March period. The Scottish Government is also targeting a 50% increase in tourism by 2015, equivalent to about 7% average annual growth.

6.22 If specific areas or regions of Scotland, including the GSABR, are to contribute towards and benefit from any growth, then there is a need for improved tourism infrastructure through both public and private investment which must be economically justified. Because competition from other areas is a possible threat, GSABR re-designation could provide a competitive advantage and a marketing opportunity for additional growth.

6.23 In addition to the accommodation (bednights) market, there are sub-sectors or segments of the market including walking, cycling, shooting, golfing and others which are being developed successfully by a range of public and private operators. There are new developments, including Dumfries House, and estates like Craigengillan Estate, planning to link with other estates throughout the GSABR as well as the many successful arts and crafts initiatives and very good quality local shops and facilities servicing tourists. They are too numerous to name but they all form the key part of the GSABR tourism product and it is believed that their outputs would be increased by the GSABR status and related provision, particularly by attracting and retaining more overseas visitors.

6.24 If the GSABR starts in 2010 and enables tourism activity to increase by 3% per year (py), the annual trips would rise by 13,500, related expenditure by £2.8 million (or an assumed 50% GVA of £1.4 million) and jobs by 155. Excluding inflation, over the following 10 years it is forecast that the tourism expenditure could increase by £35.7 million, the direct GVA by £17.85 million.

6.25 These would be the direct impacts. By applying a 1.75 multiplier to take account of the indirect and induced impacts, total GVA could increase by £31.2 million.

6.26 This is the optimistic case scenario. In response to comments from the Steering Group two alternative scenarios are provided later and are detailed in Table 7.3, one being a base case scenario of 2% py growth and the other a pessimistic case scenario of 1% py growth. Applying a 1.75 multiplier, the total increase in GVA of the base case, including indirect and induced impacts over the following 10 years is £20.8 million, with the total GVA of the pessimistic case including indirect and induced impacts over the following 10 years being £10.4 million.

6.27 It is assumed that the same level of additional employment would be retained throughout these years at 155 jobs in the optimistic case but that employment level would be less for the other scenarios, perhaps 100 jobs in the base case and about 50 jobs in the pessimistic case. s.

Angling

6.28 Angling is a segment or sub-sector of the tourism market which requires to be considered separately for development through the GSABR by promoting programmes and accessing funding for environmental river improvements. Statistics indicate that the angling market comprises about 67% visitors and 33% locals. It is estimated that about 4% of holiday trips are for angling, compared with 3% for cycling or golfing.

6.29 Angling is potentially a market providing good economic impacts and repeat angling trips. There is a lack of salmon and trout in many rivers in the South West of Scotland, which if remedied could potentially attract more anglers, both visitors and locals.

6.30 According to a study by TNS for Visit Scotland, in Scotland game angling is the most popular, accounting for 56% of trips, with sea angling 31% and coarse angling 8%. The most popular area is the Highlands with 35% of visits and then the south of Scotland with 32% of visits. There are now some excellent websites for anglers to book angling and accommodation.

6.31 The GSABR area is dominated by river systems, many sourcing in the GSABR core area and/or buffer zone. There has been well documented discussion about acidification of the upper reaches of river systems and other issues, particularly in Dumfries and Galloway, contributed to by the Galloway Forest Park, with resultant reductions in fish stocks and a negative impact on angling.

6.32 As recently as in the May 2008 edition of the widely read "Trout and Salmon" magazine there was a critical article on this topic entitled "Death by Trees", which stated that salmon catches on two beats on the Cree and Bladnoch had declined over the past 40-50 years from 71 and 116 salmon to 0 and 3 salmon respectively, which was a catastrophic decrease. Most people in the region can no longer remember the rivers being full of fish and have difficulty recognising that it is possible to restore this loss, at least partially, which could have significant economic as well as environmental benefits.

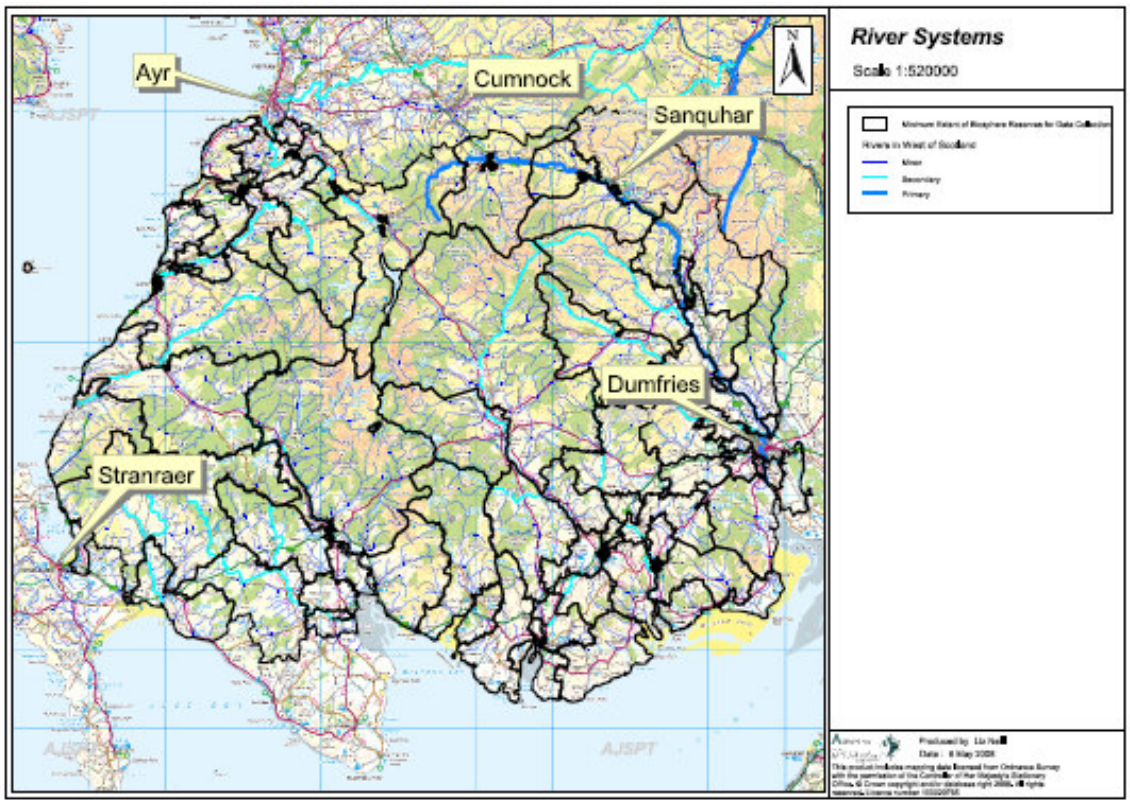
6.33 The issue of acidification is undoubtedly being addressed by the Forestry Commission Scotland (FCS), although there is also private forestry. We were told that FCS along with the local Fisheries Trusts and SEPA could achieve more. This seems to be an ideal project for the GSABR to champion, involving environmental improvements in the core area and buffer zone and the need for more research and development work in the buffer zone.

6.34 There is potential for accessing significant funding from various programmes. The positive impact that river improvements would make to fish stocks would result in more angling tourists with associated benefits and economic impacts. Mackay Consultants have done similar work on this with the Eden Rivers Trust in Cumbria.

6.35 The potential of environmental river improvements in the GSABR area was discussed during the consultations, particularly with the Galloway Fisheries Trust and the Ayrshire Rivers Trust. Both operate successfully with limited funding and with additional funding, and appropriate support, could undertake more significant river improvements.

6.36 The Galloway Fisheries Trust has responsibility for the Luce, Cree, Bladnoch, Fleet, Dee and Urr. We were told that about a third of the Cree and Bladnoch are not producing salmon because of acidification, the Dee has an issue with its hydro electric dams and Loch Ken has a crayfish problem. The Ayrshire Rivers Trust has responsibility for the Stinchar, Girvan and Doon, with some acidification in the Stinchar and Loch Doon, which is also a potential resource but underdeveloped for angling.

6.37 Both Fisheries Trusts (indeed most Fisheries Trusts) now produce Fisheries Management Plans for their rivers in consultation with interests, which provide an action plan for each river. Not only has the salmon catch and sea trout declined but so also has brown trout and rainbow trout. There is great potential to improve catches and values, particularly salmon, by targeted river restoration, diffuse pollution control, river acidification reduction and alien species control.



6.38 Over say 10-15 years, salmon catches in many rivers could increase by 30%-40% and sea trout could increase by 1000%, plus other benefits such as restoring spring salmon fishing on the Bladnoch (now a SAC) and the Cree, both presently unsustainable. Along with improved marketing, that could attract more anglers to these rivers, with hotels becoming viable between February-April.

6.39 According to a study entitled "The Economic Impact of Game and Coarse Fishing in Scotland, 2004", by Glasgow Caledonian University and Cogentsi Strategies, in Dumfries and Galloway the direct expenditure on salmon and sea trout angling was £2.96 million, including the Nith and the Annan. The latter is not in the GSABR area and therefore we were advised to reduce the salmon and sea trout angling expenditure by 25% to £2.22 million. The direct expenditure on brown trout angling was £1.19 million, on rainbow trout angling £1.21 million and on coarse angling £1.40 million. With salmon and brown trout that gives a total of just over £6 million, of which it was estimated that 77% or £4.64 million came from visitors.

6.40 From the same source, the East Ayrshire and South Ayrshire statistics were unavailable separately from "Central Scotland" but from the Government's "Scottish Salmon and Sea Trout Catches, 2006", the proportion of the Doon, Girvan and Stinchar salmon catch is about 48% and of sea trout catch is about 5% of "Central Scotland." Thus 48% was used to calculate the direct expenditure for salmon and sea trout angling, estimated at £1.62 million, of which 31% or £0.5 million came from visitors.

6.41 The Doon, Girvan and Stinchar are salmon rivers with potential for sea trout but there is no proportions given for brown trout, rainbow trout or coarse angling. Whilst these activities occur, related expenditure cannot easily be identified and it has been discounted.

6.42 The angling expenditure in the GSABR area is therefore estimated at about £7.64 million annually. The two Fisheries Trusts indicated that if major environmental improvement programmes could be promoted through the GSABR and funding accessed from, for example the SRDP, then, over about 10-15 years (or perhaps longer), in many rivers salmon numbers could increase by 30%-40% and sea trout could increase by 1000%. However, the reasons for the latter increase in particular are complex and are not all related to river improvements.

6.43 Let us assume that there is a £2 million programme of improvements for the Galloway Fisheries Trust and a £1 million programme for the Ayrshire Rivers Trust, which result in a 35% increase in both salmon and sea trout, but with at least a 5-10 years timelag. That could result eventually in additional direct annual expenditure (based on the 2004) figures of £2.67 million, beginning in 2015. On the 50% assumption, that is equivalent to an increase in local economic output (GVA) of £1.34 million in the GSABR area, and about 90 additional jobs.

6.44 If the GSABR starts in 2010 and the angling impacts are assumed to begin in 2015, for the following six years to 2020 it is estimated that angling expenditure could increase by an additional £17.2 million and GVA by an additional £8.6 million. These estimates do not differentiate between visitors and locals, which if adjusted would slightly reduce the total expenditure

6.45 In response to the Steering Group comments, two alternative scenarios are provided later, one a base case and the other a pessimistic case, as detailed in Table 7.4. The optimistic case scenario assumed a 35%-40% increase in fish stocks and angling expenditure by 2015 to 2020. The base case assumes a 17.5% increase and the pessimistic case a 8.75% increase.

6.46 The optimistic case indicated direct additional GVA over the period of £8.6 million, to which if a multiplier of 1.75 is applied, to take account of the indirect and induced impacts, would give total additional GVA of £15 million. If a lower multiplier of 1.45 is applied, as discussed in the next paragraph, the total additional GVA over the period would be £12.5 million.

6.47 The multipliers used in the Glasgow Caledonian University study are actually negative for Dumfries and Galloway and just over 1 for "Central Scotland" including Ayrshire. The reasons for that are not clear.

6.48 Multipliers of 1.75 and 1.45 were initially applied to the optimistic scenario. The latter is consistent with 1.45 applied to both a base case and a pessimistic case and which was used by Mackay Consultants for a separate study of angling on the River Eden in Cumbria. If a 1.45 multiplier is applied to all cases to estimate indirect and induced effects, then the additional total GVA of a GSABR promoted improvement programme between 2010-2020 could be for: the base case an additional £6.2 million; for the optimistic case an additional £12.5 million; and for the pessimistic case an additional £3.1 million.

Renewable energy

6.49 Renewable energy is a developing sector of the rural economy and an activity in which rural areas often have an advantage. Remoter areas tend to have higher oil/fuel prices than urban areas and are often without mains gas, so therefore there may be a financial incentive to switch from fossil fuels to renewable energy. Several innovative, but potentially risky, renewables initiatives are already underway; for example, the new Catstrand arts centre in New Galloway runs on wood chip heating; Cream O' Galloway has installed a community wind turbine; and several households take advantage of micro-hydro electricity.

6.50 The GSABR has good potential for the further development of renewable energy, particularly run-of-stream micro-hydro systems, possible renewal or improvement of existing hydro reservoir infrastructure and wood fuel biomass projects for heating. The best way to deliver this potential would be to ensure that good advice continues to be available through people such as the FCS wood energy adviser and via renewables experts in the Crichton Carbon Centre and the Ayr Energy Agency.

6.51 Biosphere Reserve status could also help focus and lever funding for the coastal and hill communities affected by wind farms. For example, South Ayrshire's Hadyard Hill Community Fund receives £120,000 each year from Scottish and Southern Energy to spend in Barr, Dailly and Pinwherry/Pinmore on health, poverty, training, culture, business, sport, environment and energy efficiency. Twenty projects in the first year included school environment projects, a river project and outreach projects from Girvan, each receiving up to £70,000. Using the fund, Ayr's Energy Agency has helped over 65% of the local households take up energy efficiency measures (cavity wall and loft insulation, solar water heating). The success of the project means that the Energy Agency is now encouraging other energy companies to roll out similar schemes elsewhere.

6.52 Barrhill Development Association is launching a Community Action Plan to raise and administer funds. The East Ayrshire Renewable Energy Fund (to be launched in autumn 2008) will ring fence community benefits contributions from wind farms to communities within 10km of the wind farm for the first 10 years, and also to the wider area thenafter. As in South Ayrshire, environmental and sustainable development projects will be targeted.

6.53 Many community councils along the Solway are preparing to distribute wind farm funds, and other communities (such as Glenkens and Dalmellington) have proposals awaiting planning decisions. If villages in Galloway and East Ayrshire were networked with the Hadyard Hill villages, all these communities would be more likely to gain the opportunity to benefit from wind farm funds, and would be more aware of best practice in using the funds wisely, with networking across local authorities' areas bringing genuine socio-economic benefits.

6.54 In future, developer contributions across all Scotland may be targeted more closely to government-preferred projects, including improvements to specific communities. Improvements to Cumnock town centre, and leisure facilities for Mauchline and Dalrymple are likely. However, although a GSABR might help plan how to spend and add value to existing funds, it would not necessarily directly bring attributable new developer contribution funds to the area.

6.55 Because renewable energy projects help to shift society away from fossil fuel-based electricity and heat production to more benign forms of energy production, they are crucial for the long term protection of the global climate. In theory, this makes renewable energy projects ideal for the carbon offset market providing a key source of start-up funding for renewables. For example, Chicago's Climate Exchange funds regional renewable energy projects including hydro, wind, photovoltaic solar power, solar hot water and biomass power and heat production.

6.56 Wood fuel is a substitute for fossil fuels for some uses and, provided harvested trees are replaced, subsequent crops of trees absorb the carbon released by burning the wood fuel. Although emissions are generated from the energy requirements for transport and processing, the use of biomass for energy still represents a substantial saving on emissions generated by use of fossil fuels. The FCS reports that wood fuel output from Scotland's forests could make an additional contribution of 0.6 – 1.5 million tonnes of avoided carbon emissions per year.

6.57 Therefore, forests within the GSABR could potentially contribute up to 0.5 million tonnes of avoided carbon emissions per year, as well as providing opportunities for local wood cutting, distribution and delivery businesses. If avoided carbon emissions are valued the same as carbon offsets at £15/tonne, then a value of £7.5 million per year could be obtained, although again this benefit could not be attributed directly to the GSABR.

6.58 However, if the GSABR specifically promoted business opportunities in wood fuel it could be assumed that 10 small businesses could be established or developed over 10 years at the rate of one per year to service this market, with average turnovers of £150,000 per year or GVAs of £0.09 million per year, accumulating after 10 years to a combined GVA of £0.9 million.

6.59 This scenario could be considered as being the optimistic case scenario and, in response to the Steering Group comments, two other scenarios have been estimated, one a base case scenario and one a pessimistic case scenario, which are outlined in Table 7.7. The base case scenario assumes a GVA of £0.11 million per year over 10 years which, including indirect and induced impacts, provides a total GVA of £1.1 million. The pessimistic case scenario assumes a total GVA of £0.05 million per year over 10 years which, including indirect and induced impacts, provides a total GVA of £0.5 million.

6.60 The GSABR could also provide an incentive for energy saving initiatives such as community insulation projects which have been very successful in pilot areas like Dundee, where voluntary and trainee labour has been used to insulate pensioners' homes. There would be potential to develop insulation installing businesses, perhaps using local sheep wool as in Cumbria. If three such businesses were established, with say 15 staff plus volunteers and trainees, and a collective turnover of £0.5 million per year or a GVA of £0.3 million per year, a multiplier of 1.75 applied for indirect and induced impacts, would provide a total GVA of £0.5 million. However, this possibility has not been specifically included in the forecasts.

Small and Medium-Sized Enterprises

6.61 Small and Medium-Sized Enterprises (SMEs) are very important to any economy and are particularly important, including self-employment, in the GSABR area. There are an estimated 5,200 small businesses and 8,300 self-employed people in the GSABR economy, particularly in the Dumfries and Galloway part. We believe there is a great opportunity to support and develop this sector through the GSABR. It would have been interesting to undertake a detailed study into the potential of SMEs in the area but the time and funds were not available for that.

6.62 In addition to marketing opportunities provided by the GSABR status, it is suggested that at least two small business programmes could be introduced through the GSABR, and others could be developed. The first two are [1] a pilot scheme providing re-cycling low interest or zero interest loans for start-ups which meet environmental criteria and remain eco-businesses and [2] an environmental advisory service for SMEs, and indeed for other larger businesses, by providing a "triple bottom line auditing" service which has proved very successful elsewhere and which could build from the Energy Agency's and Carbon Centre's work.

6.63 The start-up fund would require to be "pump primed" and added to subsequently if the pilot is successful and is extended, but it could be started at £200,000, part funded by ERDF funding at say £80,000. The GSABR fund would be sufficient to co-finance and administer, complementary to other sources, such as the WoSLF and/or commercial bank funding, 20-30 start-ups which had been environmentally advised, audited and "approved".

6.64 These new businesses could be in virtually any sector and/or targeted subject to normal viability assessment, and it is expected that demand would be high. Whilst the pilot would establish say 25 businesses employing say 50 people, with a turnover of £1.5 million annually, if extended by topping-up annually by £200,000 and recycling the repaying loans, it could finance this amount annually from a recycling fund, with management costs paid from the surplus.

6.65 The co-author of this study has extensive experience of managing small business funds. Over 10 years it is expected that the eco start-up fund could finance up to 250 new starts, say with 225 surviving, with growth employing 650-675 people. Accepting that investing in small businesses is cumulative because they grow, and assuming growth in turnovers to an average of £100,000 per year per business, then by 2020 for 225 businesses, turnover would be £22.5 million. That would be equivalent to total GVA of £13.5 million, with an average of £1.35 million per year.

6.66 This scenario could also be considered as the optimistic case scenario, although the co-author is quite confident that these outputs are achievable. However, in response to the Steering Group comments, two alternative scenarios have been estimated, one a base case scenario and the other a pessimistic case scenario, as shown in Table 7.5. The base case scenario assumes 200 SMEs over 10 years, providing a total GVA, including indirect and induced impacts, of £21 million, with an average of £2.1 million per year. The pessimistic case scenario assumes 175 SMEs over 10 years providing a total GVA, including indirect and induced impacts, of £18.4 million, with an annual average of £1.8 million.

6.67 In addition to these impacts, it is suggested that an environmental business advisory scheme, possibly managed by existing providers, would not only relate to this fund but would also work separately providing environmental advice/audits to small businesses and larger businesses, known as "triple bottom line accounting", the "triple" relating to the three elements of [1] business profitability, [2] environmental compliance and [3] community benefit.

6.68 In the North Devon BR an environmental advisory service is provided by Envision, with some excellent case studies being available. It seems that such environmental advice would cost about £500 per business and could provide cost savings/increased profits of 5-10%, as well as creating new markets and increased sales for approved businesses with environmental credentials.

6.69 This advice could be provided on energy efficiency, renewable energy, travel costs, regional inputs, water efficiency, CO2 emissions, waste management, staff training etc. Some examples quoted by Envision are: savings of £13,000 py by manufacturing bio-diesel; savings of £10,000 py by lower energy consumption; and savings of £2,000 py by recycling waste. Overall 650 SMEs have been advised by Envision, resulting in estimated £2.5 million benefits, averaging £3,846 per business per year.

6.70 Assuming 100 businesses are advised annually at a cost of £50,000 (which could be part ERDF funded at £20,000 py, although the £200,000 minimum eligible ERDF project size would need to be considered), if £300,000 of net savings/net profits are achieved py, over 10 years that would total £3 million.

6.71 As previously, two other scenarios have been examined and are included in Table 7.5. A base case scenario assumes £200,000 of net savings per year and over 10 years £2 million, which including indirect and induced impacts would be £3.5 million or £0.35 million per year. A pessimistic case scenario assumes £100,000 of net savings per year and over 10 years £1 million, which including indirect and induced impacts would be £1.75 million or £0.18 million per year.

6.72 Including the impacts together from both the eco-start-up fund and the advisory service, in Table 7.5 it is estimated that for SMEs, additional total GVA, including indirect and induced impacts, the impacts during 2010 to 2020 could be: for the base case scenario £24.5 million, with an annual average of £2.4 million; for the optimistic case scenario £28.9 million, with an annual average of £2.9 million; and for the pessimistic case scenario £20.1 million, with an annual average of £2.0 million.

Food

6.73 Every encouragement should be given in the GSABR to the local food sector and its linkages with the farming sector, thereby increasing local sales and improving quality products. There is already a quality food sector in the area and well known brands such as Cream O'Galloway, Rowan Glen Yoghurt, McLelland's "Seriously" Cheeses, Buccleuch Food Products and Galloway Lodge Preserves. There are/were various marketing initiatives such as Ayrshire's Slow Food network, the farmers markets, the Galloway Food Forum, Savour the Flavours, South of Scotland Organic Network, Food-Arts-Books, Food Futures Initiative, Castle Douglas Food Town and Ayrshire & Arran Food Networks.

6.74 From the statistics available it is difficult to identify the precise number and industry GVA for the GSABR area but the local food sector is assumed to be about 5% of the GSABR employment and output. That equates to about 3,000 people and £100 million sales per year, with an assumed 60% GVA of £60 million.

6.75 Larger food producers such as McLelland have branded products which they would not wish to re-brand and they do not generally require advice, whilst smaller food producers may not wish to re-brand because of the cost but they probably do require support. Therefore, food branding initiatives have generally had mixed success.

6.76 At present in Dumfries and Galloway there is no food network support, with Savour the Flavours having ceased, mainly because of funding ending. In that sense there is a gap but neither is there a critical mass of small food producers in the GSABR area. Support for them through a branding scheme would be expensive and require annual funding of say £250,000, with uncertain success. Co-production and retailing were suggested during our consultations but they would require detailed assessment.

6.77 If a GSABR branding and marketing scheme were to be introduced, it would probably have a mixed response, not all food producers would wish to be involved and it would probably require on-going funding. Therefore it is not recommended to introduce a branding or accreditation scheme for local food/products, at least initially, although that should be reviewed regularly and reconsidered in the future. However, the food sector and food sales would benefit from the assumed increase in visitor numbers buying food. We also recommend that an annual "meet the buyer" or business co-operation event is organised to help increase local sales, maximise tourist interest and reduce "food miles".

6.78 It is difficult in this study to evaluate this proposed project's impact within the time available but if budgeted at £50,000 it could be part funded by LEADER and if it involved 50 local producers and they increased sales by 5%, say by £10,000 per year each or by £0.5 million py in total, with an annual GVA increase of £0.3 million, then it would be worthwhile. It is recommended that this type of event is organised through the GSABR as a pilot and if successful it could be repeated annually, and then the potential for a branding marketing scheme subsequently revisited.

6.79 Over 10-11 years, an additional £3.3 million GVA of local food sales might be achieved, along with reduced "food miles". Additional jobs are more difficult to estimate although there would be some increase. If a multiplier of 1.75 is applied for the indirect and induced effects, then an additional GVA of £5.7 million might be achieved over 10-11 years.

6.80 This is now considered to be the optimistic case scenario and two alternative scenarios have been estimated and detailed in Table 7.6. The base case scenario is that this project could provide an additional £2.2 million of direct GVA, which plus indirect and induced impacts could provide a total GVA over the period of £3.8 million or £0.35 million per year. The pessimistic scenario is that this project could provide an additional ££1.1 million of direct GVA, which plus indirect and induced impacts could provide a total GVA over the period of £1.9 million or £0.18 million per year.

6.81 Another issue with the food sector is that there is no large abattoir in the south of the GSABR area and, since closure of local authority abattoirs, commercial abattoirs have become centralised to achieve economies of scale. This trend has also increased "food miles" and reduced the marketing opportunities for local farmers and food producers to provide local food to local shops and visiting tourists. The south west of Scotland is a livestock producing area and, although this matter is not strictly of GSABR interest, an investigation into abattoir viability would be consistent with the philosophy of, and could be supported by, the GSABR.

Research and Development

6.82 Research and development, education and training should occur or be promoted, particularly in the buffer zone of the GSABR, namely in the Galloway Forest Park. Training should be provided in various forms from awareness to vocational across the GSABR and in its communities, from personal development to formal training.

6.83 The Forestry Commission is particularly good at providing community training for young people, with 50 full time places for local 16-25 year olds through Project Scotland in the Galloway Forest Park. This approach could be extended from forestry work to conservation training and wildlife training, if more funding is available or accessible through the GSABR.

6.84 There is existing research in the buffer zone at Loch Doon funded by SNH and the Forestry Commission into biodiversity in the Northern fringe. In the past there have been research projects by Edinburgh University into peatlands, by Aberdeen University into heathland, by Macaulay Research into acidification and habitats, and by Glasgow Zoo into goats.

6.85 The Forestry Commission could do more research into mixed species and other research into black grouse, which could result in guided tours to particular sites. SNH report that there is an annual demand from 5-6 overseas research students to undertake environmental research in the buffer zone and more requires to be done to accommodate these requests by providing projects and facilities.

6.86 There is also an increasing need to fill the gaps left in hill and upland farming research which used to be very prominent in Scottish agriculture through the Hill Farming Research Organisation (HFRO) and the former Agricultural Colleges, now SAC which has a Hill and Mountain Research Centre, particularly for example into the effect on hill habitats and reduced stocking and the impact of large scale commercial wind farms on upland areas.

6.87 Last but not least, there is an ongoing need to enhance the work into river acidification in the buffer zone, which could be funded through the SRDPs, undertaking environmental impacts of forestry restructuring, carrying capacities and watercourse environments in various different locations and their effects on water acidification.

6.88 All this potential for research and development and education and training in the buffer zone is very important but it is understood that a separate audit of such intentions is to be undertaken by the promoting organisations. There are various existing research facilities at Dumfries Crichton Campus, Barony College and the Scottish Agricultural College.

6.89 It is also understood that the proposed FCS partnership/franchised visitor centre and outdoor centre at Loch Bogton will include training and research. This audit should include an economic impact assessment because that will be significant and its importance is noted as a key part of the GSABR, both environmentally and economically.

Community Benefits

6.90 The GSABR re-designation will impact on the regional community through BR promoted projects and related initiatives. There are clearly many existing activities and excellent initiatives in the area which the GSABR must complement. Some of these projects are illustrated and quantified below but it is only possible to outline them. It is vital for the success of the GSABR to enhance and engage with the area's towns, rural communities and existing initiatives.

6.91 In particular, it is believed that the GSABR could establish Biosphere clubs in the area's towns as the vehicle for communicating with and delivering the benefits, with the clubs being encouraged to take ownership of the GSABR and helping to manage and deliver educational, recreational and volunteering projects.

Events and Festivals

6.92 Throughout the GSABR area communities and groups run events that spring from local culture, and which draw in visitors and attract income. Many of these could benefit from Biosphere Reserve status. For example, many of Girvan's events, from the Girvan Cycle Race and the South Carrick Walking Festival to the Girvan Folk Festival, the November Festival of Light, the Lowland Gathering and the Hairy Tree Campaign, might benefit by being linked with events or marketing in other areas.

6.93 Likewise, the Music Festival Cumnock, Cumnock Highland Games, Yipworld.com, the Dalmellington Partnership and New Cumnock Volunteers could be marketed across the GSABR. The following examples of regional events and festivals were provided by Dumfries and Galloway Council, and make helpful case studies for the types of additional rural event that could be held throughout the GSABR.

Artists Open Studios: Spring Fling is a May weekend when almost 100 artists/craftspeople open their studios, so that potential buyers can drive round to view and buy art, and meet the maker. Several 'routes' are laid out, and visitors are encouraged to try local cafes, and spend a day or more touring the region. The event attracts about 9000 visitors (most trail from one studio to the next), half from D&G, 21% from Scotland, 26% from England. The event contributes an estimated £780,000 to the local economy each year through visitor spend in studios (£140k) and local businesses (£640k). Spring Fling costs £38,000 to run and the quality colour booklet also acts as the annual regional artists' brochure.

Wildlife Festival: The wildlife festival is held in early spring (Easter school holiday). It boosts out-of-season tourism and raises the profile of biodiversity. Visitors attend more than 40 events provided by about 20 participating partners. The event attracts around 2000 visits. Funding for advertising and promotional work (10,000 leaflets distributed via partners, website) comes from Dumfries and Galloway Council (£2800) and Scottish Natural Heritage (£2000). The event also uses 16 days of the DGC's Biodiversity Officer's time
Attendance in 2007 varied from 0 people (a meadow walk) to more than 200 (a badger watch, red kite feeding, and a mammal walk). Most events attracted more than 20 people (seashore walks, butterfly events, a bug safari, red squirrel day, a treasure hunt, the wildlife hospital open day, guided bird watches), and several were fully booked (Caerlaverock badger and mammal watches, and a fish watch)

Food Festival: A producers' organisation (Savour the Flavours) organised the regional Food Awards in 2006. This involved 33 participants (from butchers and fish shops to cafes and restaurants) and attracted more than 200 public nominations. Food producers entered a competition and were judged according to the quality and local provenance of their food. Winners continued to advertise their certificates for several years, and the awards encouraged several examples of intra-regional trade. The event cost more than £23,000 and was funded by Leader +, members and participants. The economic value of the event to the region was unmeasured.

6.94 **Music and theatre**: Gaelforce is a three-month long autumn festival of the creative and performing arts, held at venues small and large across the region: book festivals, all types of music, dance, art shows, landscape events, poetry, song and town galas. Some events are free, some paid; entertainment is targeted for short break visitors, local residents, and visiting friends and relatives. Refreshing, relaxing, authentic, exciting, natural.

Table 6.1: Summary of annual economic values of some rural events in Dumfries and Galloway

	Participating partners	Visits	Costs to public sector (advertising and organisation)	Direct spend	Indirect spend (taking visitor origin into account)	Benefit to Economy
Spring Fling (Art)	100	9000	£38,000	£140,000	£640,000	£780,000
Wildlife Festival	20	2000	£4,800	(free)	-	Unknown
Food Awards	33	200	£5,000	-	-	Unknown
Gael Force		49,000	?	£220,700	-	£722,000

6.95 Potential additional events might include an Autumn Arts fringe festival, to allow all artists/craftspeople in the GSABR to advertise their wares and attract buyers. There could be a wildlife festival in the autumn, perhaps linked to a Wood Festival, a bird migration festival, or a wild foods festival. A food competition could be held biennially as a Food Festival, perhaps with links to the Slow Food movement. We believe that additional events and festivals could possibly bring in more than £1m per year additional direct and indirect spending.

6.96 Many events could benefit from the additional visitor numbers that BR status and marketing could bring. Perhaps Ayrshire's future Coast Festival could be extended right round the Biosphere reserve coast into Galloway, encouraging additional boat/marina traffic into the small rural harbours and providing new impetus for high quality local food and drink outlets.

Local Initiatives

6.97 Hambrey Consulting in their 2005 report noted that "a significant feature of the area is the number of local initiatives which cover social and economic use of the environment or environmental improvements especially woodlands. These include walking routes, nature trails, voluntary partnerships, arts support, special feature "weeks" and estuarine/National Scenic Area management". It is relevant that at least 10 of the 17 initiatives listed by Hambrey Consulting were directly or indirectly related to protection or enjoyment of the environment.

6.98 Existing initiatives and partnerships would have a major role, whether community led, such as the Dalmellington Partnership, or business led, like the Themed Towns. The GSABR interactive website would also have an important role in communicating with and servicing local communities and vice versa.

6.99 It is also believed that for rural areas, where holding meetings and discussing projects is more difficult, the GSABR should establish rural networks rather than town clubs to communicate with people and to develop and deliver relevant projects, including educational, recreational and volunteering projects. It could also be possible that these rural networks develop into, for example, recycling networks or other projects and supported through the GSABR, with again these projects being monitored numerically.

6.100 In addition, East Ayrshire receives Coal Fields funding. Perhaps GSABR status might encourage radical remediation of old opencast sites throughout the GSABR: creation of new landscape artworks, for example near Sanquhar, watersports lochs, water-tourism resorts, fishing pools, nature reserves and beaver sanctuaries. Again, cross-boundary networking means that good ideas can be developed and the community economic benefits become more sustainable.

6.101 GSABR re-designation should also be able to help existing local initiatives to collaborate and grow. A survey was undertaken of a wide range of local initiatives in the arts, food, tourism and community development to establish if it is considered that re-designation would help them. The results are provided in Appendix 3, some of which also confirm the scoring and ranking in the framework. Many examples suggest that the GSABR would result in some projects having an increased chance of attracting funding or an increased amount of match funding.

6.102 A similar exercise was undertaken for Leader projects which were funded in Galloway (with Leader funding not available in Ayrshire) during the three years from 2004-2006 to make an assessment of which projects might have been able to access additional funding if the project had taken place in the GSABR. The assessment was based on whether the project seemed likely to address GSABR aims and particularly whether the project might link enterprise or culture with the environment.

6.103 Any project winning extra Leader funding would have decreased the balance of Leader funds for distribution, so only half the total eligible expenditure was counted. The results are provided in Appendix 4 but suggest that only a small additional amount may have been awarded, totalling almost £19,000 over three years or £6,300 per year. However, with new Leader funds being doubled, and the Leader area now including Ayrshire, expected GSABR additionality should be more like £20,000 per year.

Environmental Benefits

Nature Conservation

6.104 Because the core of the GSABR already has the highest UK nature conservation designation status, consultees considered that minimal additional UK government funds would be available for further core nature conservation work. However, GSABR designation might well result in more voluntary labour becoming available to carry out biodiversity management, or in greater likelihood of receiving funds for partnership projects such as those focussing on riparian zone enhancement, fisheries/river management or flood control work.

Carbon Sequestration

6.105 The GSABR would not create additional carbon funds. However, designation of the GSABR would create an excellent opportunity to develop additional regional carbon offset projects. For example, the GSABR core contains 100,000 hectares of moor. If a project was set up to re-wet just 100 ha per year by blocking ditches, that would sequester an additional 400 tonnes carbon (at £15 per tonne, a notional value of £6000 per year)[19]. Alternatively, the carbon offsets for each 100 hectare project might be sold using a one-off payment of £600 per hectare, bringing in £60,000 for each 100 ha.

6.106 In addition, the GSABR buffer contains 76,000 hectares of forest. If the GSABR created 100 ha additional permanent wet woods which could be planted without draining the peaty soils, that might attract a one-off carbon offset payment of £1000 per hectare, bringing in £100,000 for each 100 ha project. If each 100 ha project altered the bio-chemistry of 1km of salmonid tributary, resulting in less erosion, less peaky floods, and better fish-egg survival, more salmon and trout would survive and further benefits could be calculated by considering the additional value of extra salmon/more angling and each avoided flood.

[19] Although this would have to be offset against the cost of grip blocking, perhaps £200 per ha, carbon credits on the moorland would be worth more than subsidies for upland farming (roughly £10/ha)

6.107 Wood products can also help reduce carbon emissions by substituting for alternative more energy intensive materials such as steel or concrete. According to the FCS, for each cubic metre of timber used to replace a similar volume of concrete or bricks in long-term construction materials, 1 to 2 tonnes of carbon emissions can be avoided. In the GSABR, there would be increased potential to develop construction products, as well as furniture and craft products.

An example of a voluntary regional carbon exchange: Chicago Climate Exchange (from Kollmuss A, Zink H, Polycarp C, (for WWF by the Sotckholm Environment Institute) 2008: Making Sense of the Voluntary Carbon Market: A Comparison of Carbon Offset Standards

CCX accepts the following project types:

- Energy efficiency and fuel switching
- Renewable energy
- Coal mine and landfill methane
- Agricultural methane such as anaerobic digesters.
- Agricultural soil carbon: Project owners must make a minimum 5 year contractual commitment to continuous no-till, strip till or ridge till on enrolled acres.
- Rangeland soil carbon: Projects must take place within designated land resource regions . Further, non-degraded rangeland projects in specific locations that are managed to increase carbon sequestration through grazing land management that employs sustainable stocking rates, rotational grazing and seasonal use are eligible.
- Forestry carbon: a) Forestation and forest enrichment projects must be on deforested or degraded lands b) forest conservation projects in specified locations may be eligible if they are undertaken in conjunction with forestation on a contiguous site. CCX rules address permanence issues of forestry projects by requiring a carbon reserve pool equal to 20 percent of all offset credits issued for the project and the cancellation of reserve pool offsets in case of sequestration reversal.
- Ozone depleting substance (ODS) destruction is accepted only for chemicals that can no longer be produced and where there is no legal requirement to destroy remaining stocks. Chicago has been criticised for being insufficiently additional

There has been significant criticism of the lack of additionality of some CCX offsets, in particular those involving no-till agriculture. There were several documented instances where farmers received carbon offset revenue for practicing no-till agriculture despite the fact that these farmers had been practicing no till for many years already._ However, CCX argues that it would be unfair if the proactive farmer who has been practicing no-till cannot sell his carbon credits, whereas a farmer who just started doing so in order to get revenue can earn credit.

6.108 Designation of the GSABR would therefore bring direct intrinsic environmental benefits, as well as greater likelihood of environmental projects being successful, with the socio-economic value of some of these benefits outlined in other sections. It is difficult to be more specific in attributing forecast economic benefits of some environmental projects to the GSABR. These have not been included directly in the forecasts but undoubtedly they would contribute, perhaps in the longer term, and they would create a positive environment for other identified developments.

7.0 CONCLUSIONS

7.1 It is very difficult to predict the economic impact of Biosphere Reserve re-designation and therefore, with the agreement of the Steering Group, three scenarios have been used in the analysis:

- **base case**
- **optimistic**
- **pessimistic.**

7.2 Mackay Consultants consulted as widely as possible within the time and resources available and asked people for their views on the likely economic impacts of designation. However, our professional opinion as economists is that during the consultations most people probably exaggerated the likely benefits of the GSABR and therefore these opinions are included in the optimistic case scenario, which was the only one included in the draft report.

7.3 Following discussions with the Steering Group, two alternative scenarios were estimated: a base case scenario, which we believe is more realistic; and a pessimistic case scenario, which assumes the GSABR will have relatively smaller impacts.

7.4 Table 7.1 summarises the results for the direct impacts of the optimistic case scenario, showing forecast additional economic outputs, defined as gross value added (GVA) for the five most quantifiable categories which were identified and discussed in the previous sections.

7.5 This presentational approach is also used for identifying the total GVA impacts, including indirect and induced impacts, of the base case scenario in Table 7.8, of the optimistic case scenario in Table 7.9 and of the pessimistic case scenario in Table 7.10. For all three scenarios the forecast benefits of GSABR re-designation are compared with the no GSABR case.

7.6 In all three scenarios it is difficult to reconcile the timing of the future impacts of the economic sectors in the 10 years following the GSABR start, assumed to be in 2010, because the economic impacts would build gradually, they would increase at different rates, technical factors would modify impacts and timing delays would also occur. However, for the purposes of this study and to demonstrate impacts, it has been assumed that some of the full or average impacts start in 2010, some in 2011 and angling in 2015, but in reality there would be a gradual increase.

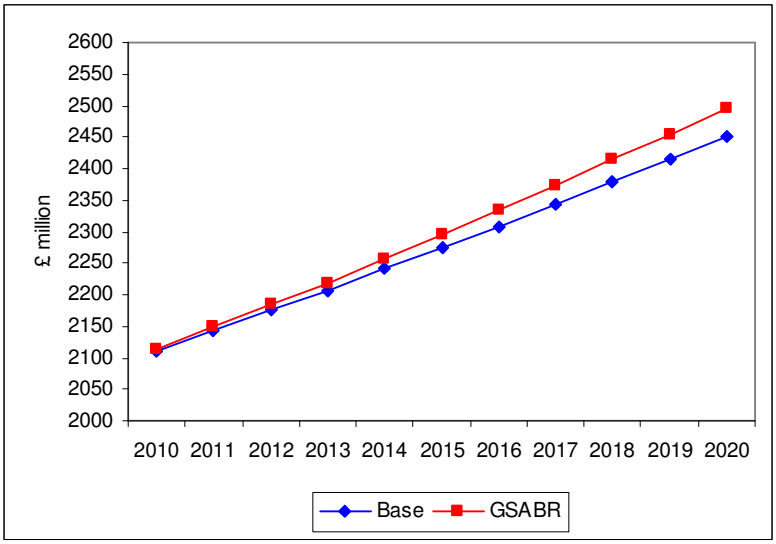
7.7 The impacts shown in Table 7.1 are the direct impacts estimated from the consultations undertaken, which provided estimates of additional direct GVA from the GSABR. The baseline economic output (GDP) is assumed to increase at an annual average of +1.5%, as set out in the first column of the table. The differences are illustrated in Figure 7.1.

7.8 The optimistic case forecasts show an increase in direct impacts of £1.7 million in 2010, rising to £5.4 million in 2020. The total increase in direct impacts over the 11 years shown is approximately £47 million.

Table 7.1: Forecast Direct Increases in Economic Output for GSABR Area: Optimistic Scenario

	GVA £m – direct GSABR impacts only without multipliers						
	BASELINE without GSABR	**GSABR additional tourism**	**GSABR additional angling**	**GSABR additional renewables**	**GSABR additional SMEs**	**GSABR additional food**	**GSABR direct impacts**
	@1.5% py						= 1.7% py
Year	£GDPm	+	+	+	+	+	£GVAm
2010	**2,111**	1.39	0	0	0	0.3	**2,113**
2011	**2,143**	1.44	0	0.09	1.65	0.3	**2,148**
2012	**2,175**	1.48	0	0.09	1.65	0.3	**2,184**
2013	**2,207**	1.52	0	0.09	1.65	0.3	**2,219**
2014	**2,241**	1.57	0	0.09	1.65	0.3	**2,257**
2015	**2,274**	1.62	1.34	0.09	1.65	0.3	**2,295**
2016	**2,308**	1.66	1.38	0.09	1.65	0.3	**2,334**
2017	**2,343**	1.71	1.41	0.09	1.65	0.3	**2,374**
2018	**2,378**	1.77	1.45	0.09	1.65	0.3	**2,414**
2019	**2,414**	1.82	1.49	0.09	1.65	0.3	**2,455**
2020	**2,450**	1.87	1.53	0.09	1.65	0.3	**2,496**
Total £m	**+339**	**17.85**	**8.60**	**0.90**	**16.50**	**3.30**	**+386**

Figure 7.1: Forecast direct GDP/GVA: without GSABR @ 1.5% py and with GSABR @ 1.7% py



7.9 The indirect and induced impacts can be calculated by applying a multiplier to the direct impacts. As discussed earlier, we believe that an appropriate multiplier for this study is generally 1.75, although later the angling multiplier is assumed as 1.45, for the reasons explained previously.

7.10 On this basis, applying multipliers of 1.75 for the other sectors and 1.45 for angling, the total increase in impacts shown in Table 7.9 in 2010 would be just under £3.0 million and in 2020 just over £9.0 million. For the 11 years shown, the overall total additional GVA impacts, including indirect and induced impacts, of the five GSABR sectors would be about £80 million.

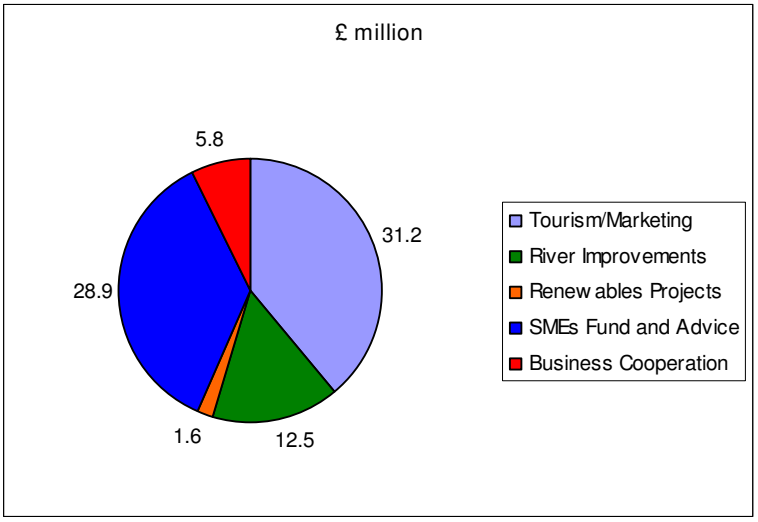
7.11 The economic growth of the GSABR area between 2010 and 2020 without the GSABR is estimated at about an additional £339 million GVA, based on average annual growth of around +1.5%. With the GSABR, considering direct impacts only, the economic growth of the GSABR area could be an additional £386 million GVA and annual growth would be around +1.7%. If the indirect and induced impacts are included, the economic growth of the GSABR area would be about £416 million and average annual growth would be around +1.8%. According to this scenario, the GSABR would increase the economic growth of the GSABR area over these 11 years by an additional +0.3% per year.

7.12 The GSABR and its components require to be funded and this funding, whether from public or private sources, must be considered as an investment rather than as a cost, with the additional growth from the GSABR being the return or leverage on this investment. The estimates are set out in Table 7.2 and Figure 7.2. The estimated costs or investments of approximately £9.0 million will generate a benefit of around £80 million, giving an overall benefit: cost ratio of 9:1, which, although it is the optimistic case, is a very encouraging ratio.

Table 7.2: Additional Estimated Optimistic GVA, Estimated Costs & Leverage, 2010-2020

GSABR Components/Projects	Estimated Costs £millions	Additional GVA £millions	Investment Leverage to 2020
Management Costs	1.5	o/head	o/head
Tourism/Marketing	1.0	31.2	31:1
River Improvements	3.0	12.5	4:1
Renewables Projects	0.7	1.6	2:1
SMEs Fund & Advice	2.3	28.9	13:1
Business Co-operation	0.5	5.8	11:1
Total	**9.0**	**80.0**	**9:1**

Figure 7.2: Estimated Additional Optimistic GSABR GVA 2010-2020



7.13 The return on investment or leverage on investment overall is estimated at almost 9:1 for the 2010-2020 period. Some of the impacts may have been overestimated and, as discussed earlier, two alternative forecasts are provided later in this section as a base case and as a pessimistic case.

7.14 However, some impacts may have been underestimated, whilst the river improvements are longer term and only include 5 years rather than 10 years. Such improvements probably take at least 10-15 years to provide a return in terms of fish stocks and angling impacts and if these benefits were to be included for 10 years to 2025, the return and leverage would be increased accordingly, depending on success or otherwise.

7.15 The management cost is classed as an overhead and should probably be spread amongst all the projects but, whether spread or otherwise, of course it is considered to be required at a relatively modest level because without dedicated management the projects will not achieve their potential. However, across all projects, if on average 40% grant funding is obtained, then estimated local or regional GSABR costs could be considered as being about £5.5 million over 10 years, with leverage resultantly increasing to about 15:1.

7.16 The study has required an innovative approach, and in the time available many estimates were required and various assumptions have been made. It cannot therefore be claimed to be a definitive study but, based on the consultations undertaken which provided the optimistic case scenario, it appears that the GSABR, if managed well and targeted effectively, could achieve an additional 0.3% per year growth for the economy of the GSABR area.

7.17 Despite this forecast being considered as optimistic, it should be stressed that some of the assumptions and forecasts are conservative in relation to views expressed by consultees. Nevertheless, it was thought prudent not to be excessively optimistic.

7.18 As discussed and agreed with the Steering Group, some or all of the impacts could be more pessimistic because of reductions in outputs and/or increased costs. If the GSABR proceeds during a period of economic downturn, then reduced impacts and lower growth may be inevitable. In particular, the Steering Group requested that more pessimistic scenarios for tourism and angling should be estimated and under the present economic circumstances other scenarios are also provided for renewables, SMEs and food.

7.19 The impacts have focused on economic output (GVA/GDP) but there are also employment implications, although caution has been exercised in forecasting job claims, with many jobs assumed as being retained rather than created. There are other benefits which, in the time available, it has not been possible to identify or justify as clearly as the economic impacts, and therefore they were not included specifically as quantified impacts. However, many of these other benefits, particularly social, community, environmental and management benefits, have been discussed and, in the longer term and/or under certain circumstances, could provide additional socio-economic, enviro-economic and other synergistic impacts.

7.20 There are many existing, complementary initiatives which would also benefit, at least marginally, from being involved in the GSABR. There are also the research and development, educational projects and environmental opportunities which would bring direct benefits to the GSABR, but they are mostly longer term. It is understood that a further audit is to be undertaken into research and development and related opportunities, which ideally should also attempt to quantify the impacts.

7.21 There are also potential management, operational, environmental and sustainability synergies, which are perhaps implied rather than specified because they are also difficult to quantify but nevertheless would be important. These synergies could be achieved if all stakeholders work together, probably in a semi-formalised way, to maximise the focus, impetus and opportunities provided by the GSABR, from planning, managing and enhancing the GSABR area as a sustainable regional ecosystem and as an internationally recognised asset.

7.22 The Steering Group requested that more pessimistic forecasts than the consultations indicated should be provided for the tourism and angling impacts. These scenarios for tourism were requested because of the present economic downturn and its possible effect on reducing tourism demand. These scenarios for angling were requested also for this reason because it is partly a sub-sector of tourism, because it would be prudent to discount the technical benefits of river improvements over longer periods and because not all river improvements may be attributable to these improvements.

7.23 Regarding tourism, the consultations suggested a wide range of future growth related to the GSABR area, which was narrowed down to between 1% and 5% per year. Whilst it is very difficult under the present circumstances to forecast with much certainty, 3% per year was applied to a 2010 base for 10 years to 2020. Other rates could be applied to the 2010 base to make the forecasts more pessimistic. Assuming that zero or negative tourism growth is unacceptable, then 2% per year and 1% per year could be applied, as shown in Table 7.3.

Table 7.3: Forecast Estimated Additional GSABR Tourism Impacts

	Additional GVA £million per year					
	+ 3%	x 1.75	+ 2%	x 1.75	+ 1%	x 1.75
Year						
2010	1.39	2.43	0.93	1.63	0.46	0.81
2011	1.44	2.52	0.96	1.68	0.48	0.84
2012	1.48	2.59	0.98	1.72	0.49	0.86
2013	1.52	2.66	1.01	1.77	0.51	0.89
2014	1.57	2.75	1.04	1.82	0.52	0.91
2015	1.62	2.84	1.08	1.89	0.54	0.95
2016	1.66	2.91	1.11	1.94	0.55	0.96
2017	1.71	2.99	1.14	1.99	0.57	1.00
2018	1.77	3.10	1.17	2.05	0.59	1.03
2019	1.82	3.18	1.21	2.12	0.61	1.07
2020	1.87	3.27	1.25	2.19	0.62	1.08
Total	17.85	**31.24**	11.88	**20.80**	5.94	**10.40**

7.24 The forecast of total direct increases from tourism growth between 2010 and 2020 ranges from just under £6 million at 1% py to just under £18 million at 3% py. The forecast of total increases from tourism growth during the same period, including the multiplier effects of indirect and induced impacts, range from just over £10 million at 1% py to just over £31 million at 3% pa or an average of £2.8 million per year.

7.25 Regarding angling, the consultations suggested that, because of the lack of salmon and trout in many GSABR rivers, large increases for both salmon and sea trout and related additional angling expenditure could be estimated for the GSABR area if enhanced environmental river improvements were promoted and undertaken through the GSABR. It was assumed that within about 10-15 years, the number of both salmon and trout could increase by about 35%-40%, after an assumed 5 years time lag. On that basis, additional angling related expenditure would not start until at least 2015, although in reality there would be a gradual or variable increase or indeed there could be a longer lead time.

7.26 The Steering Group requested that more pessimistic forecasts should be allocated to angling, partly because it is a susceptible tourism related sub-sector, partly because not all the increase could be attributed to the GSABR improvements and partly because it would be prudent to spread the technical benefits of river improvements over longer periods. Arbitrary reductions can be applied to the forecasts by assuming that the full estimated increase and related angling benefits do not occur after 5 years from 2015 but after 10 years and after 20 years which, for this study, has the same effect as discounting back the additional GSABR angling increase by an equivalent of 50% and 25% of the GVA from 2015 to 2020.

7.27 The results of the three scenarios - optimistic, base case and pessimistic - are shown in Table 7.4. For these three cases and for the reasons discussed earlier, a lower multiplier of 1.45 has been applied to the direct impacts of angling in order to estimate the total impacts.

Table 7.4: Forecast Estimated Additional GSABR Angling Increases

	Additional GVA £million per year					
	35%-40% increase	x 1.45	17.5% increase	x 1.45	8.75% increase	x 1.45
Year						
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	1.34	1.94	0.67	0.97	0.33	0.48
2016	1.38	2.00	0.69	1.00	0.34	0.49
2017	1.41	2.04	0.71	1.03	0.35	0.51
2018	1.45	2.10	0.72	1.04	0.36	0.52
2019	1.49	2.16	0.74	1.07	0.37	0.54
2020	1.53	2.22	0.77	1.12	0.38	0.55
Total	8.60	**12.46**	4.30	**6.23**	2.13	**3.09**

7.28 The forecast of total estimated angling GVA for 2015-2020 including indirect and induced impacts is for the optimistic case £12.5 million (with an average of £2 million per year), for the base case £6.2 million (average £1 million per year) and for the pessimistic case £3.1 million (average of £0.5 million per year).

7.29 The other sectors which were also identified and quantified as potentially providing economic impacts contributing to the estimated additional GDP/GVA of the GSABR were renewables, SMEs and food. The direct impacts of the renewables have already been adjusted downwards and they are relatively small even in the optimistic scenario case at £0.09 million per year but they have also been reduced to £0.06 million per year for the base case scenario and £0.03 million per year for the pessimistic case scenario. These reductions are shown in Table 7.7.

7.30 It was also thought that, depending on the economic circumstances, the SMEs impacts and the food impacts could also be reasonably revised downwards to provide further sensitivity. Regarding SMEs, it was initially estimated in the now optimistic case scenario that of 250 eco-SMEs starting and growing over 10 years, a 90% survival rate would result in 225 businesses with a GVA of £13.5 million.

7.31 If it is assumed that start numbers and/or survival rates are reduced because of economic circumstances, the latter to 80% and 70%, then average additional GVA would decrease to £1.20 million per year and to £1.05 million per year. It is also assumed that the previously identified savings by 100 businesses per year of £0.3 million per year from an environmental advisory service might be reduced to £0.2 million per year or £0.1 million per year. These three scenarios are shown in Table 7.5.

Table 7.5: Forecast Estimated Additional GSABR SME Increase at Survival Rates of 90%, 80%, 70%

	Additional GVA £million py					
	22.5 SME pa + £0.3m py	x 1.75	20 SMEs py + £0.2m py	X 1.75	17.5 SME py + £0.1m py	x 1.75
Year						
2010	0	0	0	0	0	0
2011	1.65	2.89	1.40	2.45	1.15	2.01
2012	1.65	2.89	1.40	2.45	1.15	2.01
2013	1.65	2.89	1.40	2.45	1.15	2.01
2014	1.65	2.89	1.40	2.45	1.15	2.01
2015	1.65	2.89	1.40	2.45	1.15	2.01
2016	1.65	2.89	1.40	2.45	1.15	2.01
2017	1.65	2.89	1.40	2.45	1.15	2.01
2018	1.65	2.89	1.40	2.45	1.15	2.01
2019	1.65	2.89	1.40	2.45	1.15	2.01
2020	1.65	2.89	1.40	2.45	1.15	2.01
Total	16.50	**28.90**	14.00	**24.50**	**11.50**	**20.10**

7.32 Regarding the food sector, it was estimated previously that additional direct GVA from food sales generated by the GSABR "meet the buyer" business co-operation events could be £0.3 million per year or £3.3 million over 10 years. In addition, by applying a multiplier of 1.75 the total impact including indirect and induced impacts could be £5.77 million over 10 years. This forecast was part of the now optimistic case scenario and to be consistent, a base case scenario and a pessimistic case scenario could also be considered of direct GVA of £0.2 million py and £0.1 million py, as shown in Table 7.6.

Table 7.6: Forecast Estimated Additional GSABR Food Increase at GVAs of £0.3m, £0.2m, £0.1m py

	Additional GVA £million py					
Year	optimistic direct GVA	x 1.75	base case direct GVA	x 1.75	pessimistic direct GVA	x 1.75
2010	0.30	0.52	0.20	0.35	0.10	0.18
2011	0.30	0.53	0.20	0.35	0.10	0.18
2012	0.30	0.52	0.20	0.35	0.10	0.18
2013	0.30	0.53	0.20	0.35	0.10	0.18
2014	0.30	0.52	0.20	0.35	0,10	0.18
2015	0.30	0.53	0.20	0.35	0.10	0.18
2016	0.30	0.52	0.20	0.35	0.10	0.18
2017	0.30	0.53	0.20	0.35	0.10	0.18
2018	0.30	0.52	0.20	0.35	0.10	0.18
2019	0.30	0.53	0.20	0.35	0.10	0.18
2020	0.30	0.52	0.20	0.35	0.10	0.18
Total	3.30	**5.77**	2.20	**3.85**	1.10	**1.98**

7.33 There are now three estimated scenarios for each of the five sectors of tourism, angling, renewables, SMEs and food which have been identified as potentially contributing quantifiable additional GVA to the GSABR area. There is an optimistic case estimated from consultations undertaken, there is, it is believed, a more realistic base case and, under present circumstances, there is a pessimistic case. These three scenarios for each sector are shown in Table 7.7.

Table 7.7: Forecast Estimated Additional Total Impacts of Quantified Sectors for Three Scenarios
(Scenarios: P = pessimistic case; B = base case; O = optimistic case)

	Additional GVA £million per year														
	tourism			angling			renewables			SMEs			food		
	P	B	O	P	B	O	P	B	O	P	B	O	P	B	O
Years															
2010	0.81	1.63	2.43	0	0	0	0	0	0	0	0	0	0.18	0.35	0.52
2011	0.84	1.68	2.52	0	0	0	0.05	0.11	0.16	2.01	2.45	2.89	0.18	0.35	0.53
2012	0.86	1.72	2.59	0	0	0	0.05	0.11	0.16	2.01	2.45	2.89	0.18	0.35	0.52
2013	0.89	1.77	2.66	0	0	0	0.05	0.11	0.16	2.01	2.45	2.89	0.18	0.35	0.53
2014	0.91	1.82	2.75	0	0	0	0.05	0.11	0.16	2.01	2.45	2.89	0.18	0.35	0.52
2015	0.95	1.89	2.84	0.48	0.97	1.94	0.05	0.11	0.16	2.01	2.45	2.89	0.18	0.35	0.53
2016	0.96	1.94	2.91	0.49	1.00	2.00	0.05	0.11	0.16	2.01	2.45	2.89	0.18	0.35	0.52
2017	1.00	1.99	2.99	0.51	1.03	2.04	0.05	0.11	0.16	2.01	2.45	2.89	0.18	0.35	0.53
2018	1.03	2.05	3.10	0.52	1.04	2.10	0.05	0.11	0.16	2.01	2.45	2.89	0.18	0.35	0.52
2019	1.07	2.12	3.18	0.54	1.07	2.16	0.05	0.11	0.16	2.01	2.45	2.89	0.18	0.35	0.53
2020	1.08	2.19	3.27	0.55	1.12	2.22	0.05	0.11	0.16	2.01	2.45	2.89	0.18	0.35	0.52
Total	**10.4**	**20.8**	**31.2**	**3.1**	**6.2**	**12.5**	**0.5**	**1.1**	**1.6**	**20.1**	**24.5**	**28.9**	**2.0**	**3.8**	**5.8**

7.34 The three scenarios of estimated additional total impacts from 2010 to 2020 supersede the previous estimates and are shown in Tables 7.8, 7.9 and 7.10.

Table 7.8: Forecast Increases in Economic Output for GSABR Area: Base Case Scenario

	GVA £m : total GSABR impacts with multipliers, base case						
	BASELINE without GSABR	**GSABR additional tourism**	**GSABR additional angling**	**GSABR additional renewables**	**GSABR additional SMEs**	**GSABR additional food**	**GSABR BASE CASE**
	@1.5% py						= 1.7% py
Year	GDP £m	+	+	+	+	+	GDP £m
2010	**2,111**	1.63	0	0	0	0.35	**2,113**
2011	**2,143**	1.68	0	0.11	2.45	0.35	**2,150**
2012	**2,175**	1.72	0	0.11	2.45	0.35	**2,187**
2013	**2,207**	1.77	0	0.11	2.45	0.35	**2,224**
2014	**2,241**	1.82	0	0.11	2.45	0.35	**2,263**
2015	**2,274**	1.89	0.97	0.11	2.45	0.35	**2,302**
2016	**2,308**	1.94	1.00	0.11	2.45	0.35	**2,342**
2017	**2,343**	1.99	1.03	0.11	2.45	0.35	**2,383**
2018	**2,378**	2.05	1.04	0.11	2.45	0.35	**2,423**
2019	**2,414**	2.12	1.07	0.11	2.45	0.35	**2,465**
2020	**2,450**	2.19	1.12	0.11	2.45	0.35	**2,507**
Total £m	**+339**	**20.8**	**6.2**	**1.1**	**24.5**	**3.8**	**~+394**

Table 7.9: Forecast Increases in Economic Output for GSABR Area: Optimistic Scenario

	GVA £m : total GSABR impacts with multipliers, optimistic case						
	BASELINE without GSABR	**GSABR additional tourism**	**GSABR additional angling**	**GSABR additional renewables**	**GSABR additional SMEs**	**GSABR additional food**	**GSABR OPTIMISTIC CASE**
	@1.5% py						= 1.8% py
Year	GDP £m	+	+	+	+	+	GDP £m
2010	**2,111**	2.43	0	0	0	0.52	**2,114**
2011	**2,143**	2.52	0	0.16	2.89	0.53	**2,152**
2012	**2,175**	2.59	0	0.16	2.89	0.52	**2,190**
2013	**2,207**	2.66	0	0.16	2.89	0.53	**2,228**
2014	**2,241**	2.75	0	0.16	2.89	0.52	**2,268**
2015	**2,274**	2.84	1.94	0.16	2.89	0.53	**2,309**
2016	**2,308**	2.91	2.00	0.16	2.89	0.52	**2,352**
2017	**2,343**	2.99	2.04	0.16	2.89	0.53	**2,396**
2018	**2,378**	3.10	2.10	0.16	2.89	0.52	**2,440**
2019	**2,414**	3.18	2.16	0.16	2.89	0.53	**2,485**
2020	**2,450**	3.27	2.22	0.16	2.89	0.52	**2,530**
Total £m	**+339**	**31.2**	**12.5**	**1.6**	**28.9**	**5.8**	**~+416**

Table 7.10: Forecast Increases in Economic Output for GSABR Area : Pessimistic Scenario

	GVA £m : total GSABR impacts with multipliers, pessimistic case						
	BASELINE without GSABR	**GSABR additional tourism**	**GSABR additional angling**	**GSABR additional renewables**	**GSABR additional SMEs**	**GSABR additional food**	**GSABR PESSIMISTIC CASE**
	@1.5% py						= 1.6% py
Year	GDP £m	+	+	+	+	+	GDP £m
2010	**2,111**	0.81	0	0	0	0.18	**2,112**
2011	**2,143**	0.84	0	0.05	2.01	0.18	**2,147**
2012	**2,175**	0.86	0	0.05	2.01	0.18	**2,182**
2013	**2,207**	0.89	0	0.05	2.01	0.18	**2,217**
2014	**2,241**	0.91	0	0.05	2.01	0.18	**2,254**
2015	**2,274**	0.95	0.48	0.05	2.01	0.18	**2,290**
2016	**2,308**	0.96	0.49	0.05	2.01	0.18	**2,328**
2017	**2,343**	1.00	0.51	0.05	2.01	0.18	**2,367**
2018	**2,378**	1.03	0.52	0.05	2.01	0.18	**2,406**
2019	**2,414**	1.07	0.54	0.05	2.01	0.18	**2,446**
2020	**2,450**	1.08	0.55	0.05	2.01	0.18	**2,486**
Total £m	**+339**	**10.4**	**3.1**	**0.5**	**20.1**	**2.0**	**~+374**

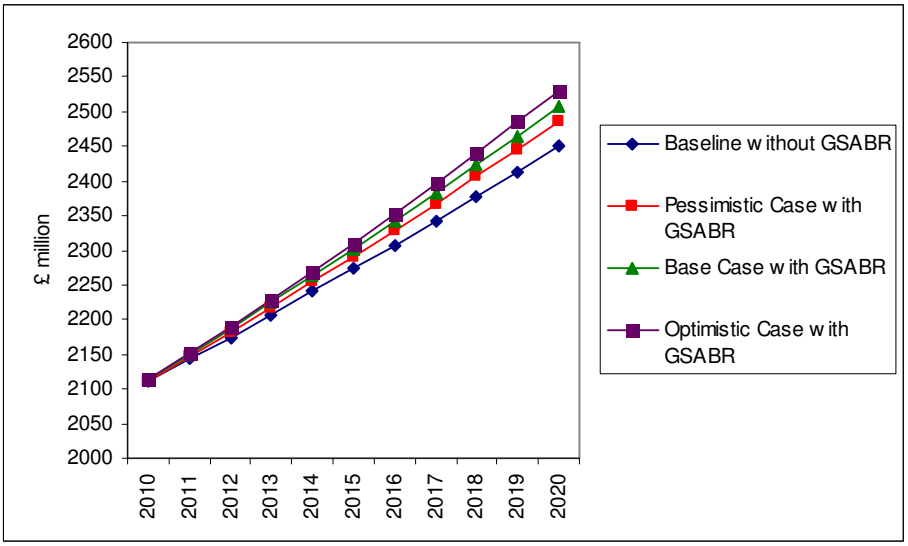
7.35 The three scenarios and the related impacts on the estimated additional GDP/GVA of the GSABR provide ranges of economic growth of additional GDP/GVA, shown in Table 7.11 averaging 1.6% py, 1.7% py and 1.8% py, compared with the baseline without GSABR of about 1.5% py. Therefore, the additional annual economic growth attributable to the GSABR is estimated to be in the range +0.1% to +0.3%. The additional outputs over 11 years ranges from the pessimistic at +£36 million, to the base case of +£56 million and the optimistic at +£80 million, with the annual averages being about £3 million, £5 million and £7 million respectively.

Table 7.11: Comparison of the Three Forecast Scenarios

	GVA £million : total GSABR impacts with multipliers, three cases			
Year	**Baseline without GSABR @ 1.5% py**	**with GSABR Pessimistc Case = 1.6% py**	**with GSABR Base Case + 1.7% py**	**with GSABR Optimistic Case + 1.8% py**
2010	2,111	2,112	2,113	2,114
2011	2,143	2,147	2,150	2,152
2012	2,175	2,182	2,187	2,190
2013	2,207	2,217	2,224	2,228
2014	2,241	2,254	2,263	2,268
2015	2,274	2,290	2,302	2,309
2016	2,308	2,328	2,342	2,352
2017	2,343	2,367	2,383	2,396
2018	2,378	2,406	2,423	2,440
2019	2,414	2,446	2,465	2,485
2020	2,450	2,486	2,507	2,530
Total	**+339**	**+374**	**+394**	**+416**

7.36 These forecasts are also illustrated in Figure 7.3. GDP in absolute terms increases without the GSABR from an estimated £2,111 million to £2,450 million and with the GSABR base case from an estimated £2,113 million to £2,507 million. The difference is £55 million.

Figure 7.3: Estimated Economic Forecasts for the GSABR Area, 2010-2020: GDP £million without GSABR and with GSABR



7.37 The optimistic scenario was identified previously as providing estimated leverage or additionality, compared with estimated costs, of about 9:1. If it assumed that the estimated costs are the same as previously, excluding private sector investment for example in tourism which in this study is indeterminate, then leverage or additionality would decrease for the base case scenario to about 6:1 and for the pessimistic case scenario to about 4:1, with all three scenarios still positive and indicating a range of leverage.

7.38 The base case scenario is forecast to provide additional annual growth of about +0.2%, which is considered to be reasonably realistic. However, it is for the Steering Group to evaluate the three forecast scenarios and/or to consider these forecast scenarios in relation to their decision to proceed or otherwise in seeking and justifying GSABR status.

GSABR BIOSPHERE ADDITIONALITY MODEL: MATRIX '

Across the top row of this matrix are examples of individual elements/components that would/could occur in a biosphere reserve as part of its developme

Down the left hand column of this matrix are the sectors of rural socio-economy that could be impacted by biosphere developme

The components were then scored to indicate how much beneficial economic impact (on a score of 1 (low) to 3 (high)) each component of biosphere development would have on each sec

(no biosphere reserve components are expected to have negative economic impacts, since non are compulsory/statutor

scoring 1-3 (3 high)

ELEMENTS	global status	gateways	info-points	website	signage	funding applns	bios-labels	bios-accred	eco-transport	planning support	eco-advice	eco-training	r & d	start-up fund	co-op events	large events	bios-clubs	bios-nets				SCORE	RANK
ECONOMIC																							
tourism:																						0	
accommodn.	3	2	2	3	0	1	1	1	0	1	1	1	0	2	2	2	2	2				26	5
attractions	3	3	3	3	3	2	1	1	1	1	1	1	0	3	2	2	1	1				32	1
arts & crafts	2	3	2	3	1	3	1	1	0	1	1	0	0	3	2	1	2	2				28	3
walking	2	2	2	3	2	2	1	1	2	1	1	0	0	1	1	1	1	1				24	7
cycling	2	2	2	3	2	2	1	1	1	1	1	0	0	2	2	1	1	1				25	6
angling	2	2	2	3	1	3	1	0	1	1	3	1	3	2	2	1	1	1				30	2
shooting	0	0	0	1	0	0	0	0	0	0	1	0	1	0	2	1	1	1				8	15
																						0	
agriculture	1	0	0	0	0	2	1	1	0	2	2	2	2	1	1	1	1	1				18	11
																						0	
food & drink	2	2	1	1	0	2	2	2	0	1	1	1	1	2	3	2	2	2				27	4
																						0	
forestry	0	0	0	0	0	1	0	0	0	2	1	1	2	0	0	0	0	0				7	16
																						0	
timber products	1	0	0	0	0	1	1	1	0	1	1	1	1	3	2	1	1	1				16	12
																						0	
renewables	1	0	0	0	0	2	0	1	1	2	1	3	3	3	2	1	1	2				23	8
																						0	
small SMEs	1	1	1	1	1	3	2	2	1	1	2	2	1	3	2	1	1	1				27	4
																						0	
shops/retail	2	1	1	1	1	1	1	0	0	1	1	1	0	2	2	1	1	1				18	11
																						0	
manufactg.	1	0	0	0	0	1	1	1	0	1	2	2	1	2	2	1	0	1				16	12
																						0	
SOCIAL																						0	
																						0	
rural	3	1	2	1	2	2	1	0	2	1	1	1	1	2	2	2	1	3				28	3
																						0	
towns	2	1	1	2	2	1	1	0	1	1	1	1	0	2	2	3	3	1				25	6
																						0	
initiatives	2	2	1	3	2	3	1	0	1	1	1	1	0	2	3	2	2	3				30	2
																						0	
housing	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0				3	18
																						0	
transport	0	1	1	1	1	1	0	0	3	1	0	0	0	1	1	1	1	1				14	14
																						0	
education	2	1	1	2	0	1	0	0	1	2	3	3	0	0	1	1	2	2				22	9
																						0	
recreation	2	2	2	2	2	2	2	0	2	2	0	1	1	1	1	1	2	2				27	4
																						0	
volunteering	2	1	1	1	2	2	2	0	1	2	1	2	1	0	1	2	2	2				25	6
																						0	
ENVIRONMENTAL																						0	
																						0	
flood managemer	1	0	0	0	0	2	0	0	0	2	3	3	3	0	1	0	0	0				15	13
																						0	
nature conservati	3	2	1	1	1	3	0	0	0	2	3	3	3	0	1	1	0	0				24	7
																						0	
water supply	0	0	0	0	0	0	0	0	0	2	0	0	3	0	0	0	0	0				5	17
																						0	
carbon trading	3	0	0	2	0	2	1	0	1	2	2	2	3	1	1	1	2	0				23	8
																						0	
landscape manag	3	2	2	1	1	2	1	0	0	2	2	2	2	0	0	1	0	0				21	10
																						0	
SCORE	**45**	**29**	**26**	**37**	**23**	**45**	**22**	**13**	**20**	**35**	**35**	**33**	**30**	**38**	**41**	**31**	**31**	**32**	**0**	**0**	**0**		
RANK	**1**	**10**	**11**	**4**	**12**	**1**	**13**	**15**	**14**	**5**	**5**	**6**	**9**	**3**	**2**	**8**	**8**	**7**					

GSABR BIOSPHERE RANKING MODEL: MATRIX 2

ELEMENTS	bio-status	website	funding	start-up	R & D	eco-advice	eco-traing	co-op events	networks	gateways	bio-events	bio-clubs	bio-info	signage	transport	support	labelling	branding	
ECONOMIC																			**RANK**
attractions																			**1**
initiatives																			**2**
angling																			**2**
conservation																			**2**
arts & crafts																			**3**
r/newables																			**4**
rural areas																			**5**
SMEs																			**5**
accommodation																			**5**
local towns																			**5**
carbon trade																			**5**
local food																			**6**
cycling																			**6**
education																			**6**
walking																			**7**
l/scape man.																			**7**
recreation																			**8**
volunteers																			**8**
RANK	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**11**	**11**	**12**	**12**	**13**	**13**	**13**	

APPENDIX 3: LOCAL INITIATIVES

Community Initiatives (arts, food, tourism, community development…)

		How might biosphere designation help?	How likely to benefit financially from biosphere reserve? 6 unlikely to benefit 4 1-10% more income 44 10-50% more income 444 >50% more income	Grants awarded in 2007 (L+ = Leader+) Or visitor numbers 2007	How to measure additionality Add 4 1%, 4 4 10% or 4 4 4 50% of 2007 funding
Auchencairn Initiative	Ross Paton 01556 640 247	Slightly more likely to attract grant aid	4		
Carty Port Community Company	Donallan Carty Port Newton Stewart DG8 6AY fcarrie@ecosse.net	Slightly more likely to attract grant aid	4		
Dalbeattie Community Initiative	Graham Platt 01556 612518	Slightly more likely to attract grant aid	4		
Glenkens Community Arts Project	Cathy Agnew Catstrand 01644420374	Slightly more likely to attract grant aid, plus would use logo and increase visitor numbers	4		
Moniaive Action Project	Sue Grant 01848 200 331	Slightly more likely to attract grant aid	4		
Stranraer Millenium Centre Community Action Trust	Eileen Bryant 01776 700000	Slightly more likely to attract grant aid	4		
Carsphairn Heritage Group	Liz Holmes 01644 460 653	Slightly more likely to attract grant aid	4		
Stranraer waterfront		Slightly more likely to attract grant aid	4	20000 L+	200
Wigtown Booktown		Slightly more likely to attract grant aid	4	12000 L+	120
Gatehouse of Fleet		Slightly more likely to attract grant aid	4	3000 L+	30
Kirkcudbright Artists town		Slightly more likely to attract grant aid	4	8000 L+	80

Castle Douglas Food Town	Steve Gromme 01557 814428	Slightly more likely to attract grant aid, plus members could use logo to increase sales	4		
Savour the Flavours		Slightly more likely to attract grant aid, members could use logo to increase sales	6 (closed)		
Gatehouse Farmers Market		Members could use logo to increase sales	4		(see food sector)
Auchencairn Farmers Market		Members could use logo to increase sales	4		(see food sector)
Castle Douglas Farmers Market		Members could use logo to increase sales	4		(see food sector)
Dalry Farmers Market (and/or Corsock?)		Members could use logo to increase sales	4		(see food sector)
Ayrshire Food Network	Howard Wilkinson	Members could use logo to increase sales	4		(see food sector)
Ayr farmers market		Members could use logo to increase sales			(see food sector)

Environmental/ woodland/ farming Initiatives

		How might biosphere designation help?	How likely to benefit financially from biosphere reserve? 6 unlikely to benefit 4 1-10% more income 44 10-50% more income 444 >50% more income
East Ayrshire Woodlands	Mark Davies– did a survey about the Biosphere Bruce Davidson 07734972673 www.eastayrshirewoodlands.co.uk	More likely to get funding	44
Southern Uplands Partnership	Pip Tabor, Flora McDowall 01750 725154 piptabor@sup.org.uk	More likely to get funding	4
Ayrshire Rivers Trust		More likely to get funding, so more likely to improve fishing, so more likely to improve angling values/outputs	44
Galloway Fisheries Trust		More likely to get funding, so more likely to improve fishing, so more likely to improve angling values/outputs	444
Galloway Forest Park	Creetown- Willie Laurie Forest ranger, Peter Kelly Deer forestry	Likely to increase visitor numbers and visitor spend - 850,000, planned to increase to 1,600,000 and increase spend - whether or not in BR	4
Cree Valley Community Woodland Trust	Peter	More likely to get funding, so more likely to get more visitors	4
Galloway Kite Trail	Chris Rollie	More likely to get funding, so more likely to get more visitors	44
Stewartry Local Rural Partnership			4
Wigtown Bay Local nature Reserve	Elizabeth Tyndall	Likely to use logo and to increase visitor numbers	4
Kirroughtree Mountain Bike Trails and visitor centre		Likely to use logo and to increase visitor numbers	4
SNH Community Grants Scheme		SNH expect no likely added benefit from being in BR – yet projects more likely to attract match funding if in BR	44
SNH special projects		SNH expect no likely added benefit from being in BR – yet projects more likely to attract match funding if in BR	44

Dumfries and Galloway Council		Ranger led walks and events, walks, fishing and cycling leaflets	44
Special Places Fund (Leader +, SNH and D & G LA)			
Solway Firth Partnership		More likely to attract match funding for projects	4
Fleet Valley National Scenic Area		More likely to attract match funding for projects	4
South of Scotland Organic Farmers Network	50 organic farms in Galloway's BR area	Members may use logo and increase sales	4

Regional Events and Festivals
(measure additionality via visitor numbers)

	?	How might biosphere designation help?	How likely to benefit financially from biosphere reserve? 6 unlikely to benefit 4 1-10% more income 44 10-50% more income 444 >50% more income
Knockengorrock Festivals	Music festival	Increase visitor numbers	6 (alt market segment)
Glenkens Alternative Games	Highland games	Increase visitor numbers	6 (alt market segment)
Kirkmichael Guitar Festival		Increase visitor numbers	4
Moniaive Folk Festival		Increase visitor numbers	4
Creetown Country and Western weekend		Increase visitor numbers	4
Gael Force	Music, theatre, dance (autumn)	Increase visitor numbers	4
Spring Fling	Artists studios open weekend	Increase visitor numbers 51 venues in Galloway BR	4
Burns an' a' that	Music, theatre, dance (spring)	Increase visitor numbers	4
Ayrshire arts/crafts	Open studios	Increase visitor numbers	4
Galloway Wood Festival			
D&G Wildlife festival	Peter Noman, DGCouncil 2-week early spring event to attract additional tourists to region.	Increase visitor numbers Most popular events – badger watch, red kites, mammal walk, ospreys, wildlife hospital, forest	44
Newton Stewart Walking festival		Increase visitor numbers	44
Glenkens Walking Week		Increase visitor numbers	4
Straiton walking festival		Increase visitor numbers	44
D& G Arts Festival	Barbara Kelly 01387260 447	Increase visitor numbers	4
West Fest	David Sumner 01988 850368	Increase visitor numbers	4
Portpatrick Festival		Slightly more likely to attract grant aid, and could use logo to increase visitor numbers	4
Mauchline Fayre		Slightly more likely to attract grant aid, and could use logo to increase visitor numbers	6 (alt market segment)

APPENDIX 4: LEADER FUNDING

Many of the examples above suggest that GSABR designation might result in some projects having an increased chance of getting funding, or an increased amount of match funding.

The following table considers projects which were awarded Leader + funding in Galloway during the last three years (2004-2006), assessing which projects might have been able to access additional funding (for example, via the Lottery or other charitable foundations) if that project had taken place in a biosphere reserve. The assessment was based on whether the project seemed likely to address biosphere reserve aims, and particularly whether the project might link enterprise or culture with the hills/moors of Galloway. (Leader+ projects east of Dumfries/Nithsdale have been omitted from this list)

Any project winning extra Leader+ funding would have decreased the balance of Leader+ funds for distribution, so only half the total eligible expenditure (the part not awarded by Leader+) is counted.

Formula used:
Project slightly likely to have found additional funds: 1% of Leader+ award
Project very likely to have found additional funds: 10% of Leader+ award
Project almost certain to have found additional funds: 50% of Leader+ award.
(note several of the projects below might have had a 50% chance of extra funding if the project had been focused on the biosphere hills rather than the coast)

For example, the Leader+ website summarises the Auchencairn Enterprise Centre as follows:
"The Auchencairn Enterprise Centre is expected to provide a sympathetic infill to a conservation area and will be owned and managed by the community. The centre will provide information for tourists, sales opportunities for local food and craft producers. The project manager is also keen to develop the eco-tourist potential by providing a central base for walkers, bird watchers and cyclists."

This project combines local enterprise with local food and wildlife. If it had taken place in the hills of a biosphere reserve, we consider it might have had a 50% chance of gaining additional funding. Because it took place on the coast, we have estimated that it might have had a 10% chance of gaining additional funding if it had linked itself with the Biosphere Reserve.

Projects in GBR area which received LEADER+ funding in the three years 2004-2006

Project		Contact	Total Eligible Expenditure/ Award	% added value if was in a biosphere reserve	Likely added value
Special Places Grant Scheme 2	Environmental projects on SSSIs and Natura sites	SNH Chris Miles 01387 247010 chris.miles@snh.gov.uk	£60,000 / £30,000	nil	
Kiltimagh Connections	Poet exchange with Ireland	Andrew Forster 01387 253383 Andrew@dgaa.net	£10,450 / £5,225	nil	
Booktown Tourism Transnational Project	Collaboration with Becheral , France	Angela Everitt 01988 403266 angela@reading-lasses.com	£24,440 / £11,990	nil	
Gatehouse Of Fleet Artists' Marketing Co-Operative	Venue and marketing for 'The Bakehouse'	Chrys Salt 01557 814196 chryssalt2@aol.com	£6,758 / £3,324	1%	33
Kirkcudbright Arts' Crossroads	Organisation of arts events	John Hudson 01556 504245 j.hudson@btinternet.com	£17,300 / £8,300	1%	83
Buccleuch Arts Initiative	Performing arts venue	David Stevenson 013873 80416 dds@ashleybank.co.uk	£109,800 / £31,200	nil	
Beacon Events Support Fund 2007	Helps local events reach Beacon status	Ian Barr 01557 330291 ianba@dumgal.gov.uk	£40,000 / £20,000	nil	
Closing The Eco Schools Loop	Helps schools go green	George MacQuarrie 01387 247543 gmacquarrie@solwayheritage.co.uk	£24,584 / £12,292	1%	123
Going The Extra Mile	Helps Kirkconnel Parish Heritage Society, sustainability	Jacky Wilson 01659 66002 jacky@kirkconnel.org	£17,266 / £8,518	1%	85
Festival Of The Book	Bookmaking, papermaking, printing festival	Moi McCarty 01988 402062 moi@orkneybooks.co.uk	£14,900 / £7,450	nil	
Linking Sustainable Farming, Tourism & Biodiversity	Awareness of farm wildlife, benefits for tourism and farm business	Wendy Fenton 01387 760576 wendy.fenton@fwag.org.uk	£7,230.90 / £3,614.02	10%	361
Expanding Horizons	Family farm visits to/from Sweden	Malcolm Morrison 01387 274381 Malcolm.morrison@smithsgore.co.uk	£34,000 / £17,000	10% if to another biosphere reserve	170
Growth For Gatehouse	More music and literary events, bigger venue	Chrys Salt 01557 814196 chryssalt2@aol.com	£7,071 / £3,471	1%	35
Stage Further	Events at outdoor theatre, Orchardton Gardens	Bill Barlow 01556 640353 llib@wolrab.net	£12,891 / £6,490.50	1%	65
Auchencairn Enterprise Centre	Community owned and managed food/craft shop and eco-tourist point	David Dunstan 01556 640238 dunstandavid@hotmail.com	£52,249.06 / £26,624.53	10%	2662
Building A Youth Project Centre And Making A Muti-Sport Area	Developing Port William harbour area for water tourism	Pauline Watkins 01988 700501 jrw4071@aol.com	£118,592.67 / £59,296.33	nil	
Biker	Developing biker routes, posting on	Karen Wilson	£1,500 / £750	nil	

Tourism 2	web	01387 24557 Karen.Wilson@visitscotland.com			
Time And Tide	Saving old shipping songs, coastal heritage, singing and performing	Alan James	£12,888.13 / £6,444.06	nil	
Storytelling Pathfinding Project	Train 50 storytellers, set up a storytelling centre	Karen Donald 01644 420374 karend@glenkensbb.co.uk	£18,330 / £8,355	1%	83
Castle Kennedy International Horse Driving Trials	Twin with Tipperary, Ireland	Jane McDowall 07702 488179 jane@castlekennedydriving.com	£44,000 / £17,600	nil	
Buccleuch Centre Lighting Project	'Painting' the new performance venue with light	Jan Hogarth 01387 253383 susan@dgaa.net	£34,536.00 / £13,286.00	nil	
Bladnoch Distillery Project	Youth dance artistry, skateboard street dancing		£15,400.00 / £7,700.00	nil	
Working Towards A Galloway And Southern Ayshire Biosphere Reserve	Informing people about the biosphere reserve	Andrew Bielinski 01671 401075 andrewbielinski@snh.gov.uk	£59,108.00 / £19,506.00	10%	1950
Art In Public Places	Commissioning artworks for new community arts venue, New Galloway	Karen Donald 01644 420374	£93,410.00 / £43,902.70	1%	439
Solway Coast Environemntal Tourism And Education Project	Helps set up a longer term project on wildlife tourism, Solway coast	Chris Rollie 01556 670498 chris.rollie@rspb.org.uk	£38,950 / £17,376	10%	1737
Galloway Writers Centre Pilot Project	Events, networking, sales, training for writers	Chrys Salt 01557 814196 chryssalt2@aol.com	£17,359 / £ 8,359	nil	
Galloway Garden International Exchange Project	Increase business for commercial gardens here and in Brittany	Anne Watson 01776 702992 ladygalloway@aol.com	£139,000 / £69,750	nil	
Food Awards	Regional food awards showcasing local food	Graeme Hume 01557 870203 graeme@flavourofgallowayay.co.uk	£23,000 / £11,500	10%	1150
South Of Scotland Equestrian Tourism Development Officer	Marketing and development of horse riding trails and accommodation	Helene Mauchlen 01764 656334 H.mauchlen@bhs.org.uk	£26,250 / £13,125	10%	1312
Biker Tourism Feasibility Study	Potential for biker tourism (150,000 visitors to North West weekend)	Roslyn McNay 01556 504906 roslynm@dumgal.gov.uk	£2,500 / £1,250	nil	
Kirkcudbright At The Cutting Edge	Links with art schools in Brittany and Rhode Island, US	John Hudson 01556 504245 j.hudson@btinternet.com	£31,110 / £15,555	nil	
Gyro-Scope Development Project	Street dance, traditional music and drama for school children in the Glenkens	Karen Donald 01644 420374	£31,700 / £15,850	1%	158
Gdi Windturbine	Two micro wind turbines, income to be used as match funding for future	Ken Smyth 01557 814458	£100,580 / £50,290	1%	502

	Gatehouse community development				
Festival And Major Events Tourism Challenge Fund	Grows special local festivals into national events	Ian Barr 01557 330291 ianba@dumgal.gov.uk	£230,000 / £100,000	nil	
Digital Media Centre	Graphic design, filming, editing, book publishing for Upper Nithsdale businesses	Jacky Wilson 01659 66002 jacky@kirkconnel.org	£65,244 / £65,244	nil	
Words In Place	Helping school children write (and sell) creatively		£15,080 / £7,540	nil	
Castle Douglas Food Town Phase 2	Food events for businesses, visitors , schools, and public	Stephen Groome 01557 814428 stevegroome@supanet.com	£25,700/ £10,700	10%	1070
Southern Upland Way 21	Events and marketing for 21st birthday of long distance path	Flora McDowall 01644 420808 floramcdowall@sup.org.uk	£11,500/ £5,750	10%	575
Rural Touring Network For Dumfries And Galloway	rural arts touring circuits where performers can perform for local audiences	Jenny Wilson 01387 253383 jenny@dgaa.net	£165,000/ £65,000	1%	650
DUMFRIES AND GALLOWAY Nsas COMMUNITY RANGER	Guided walks by volunteers along East Stewartry coast	Duncan Stevenson 01721 726008 dstevenson@nts.org.uk	£47,838.80/ £17,838.80	1%	178
Dog Sport Scotland	Developing dog-sled racing	Steven Lindsay 01387 860251	£165,830/ £68,000	nil	
Stewartry Area Windband – Holland Trip	40 band members trip to Valkenburg, Holland	Colin Jackson 01557 330208 mariejackson@hotmail.com	£15,514/ £7,564.50	1% (if to a biosphere reserve)	75
Mill On The Fleet Feasibility Study	Feasibility for tourist redevelopment of the Mill, Gatehouse		£20,000/ £10,000	10%	1000
Dalbeattie Skills And Business Audit	Training for community businesses	Graham Platt 01556 612518 grahamp@dcinitiative.fsnet.co.uk	£7,900/ £3,950	nil	
The Wigtown Poetry Competition	Perhaps to become Scotland's National Poetry Competition	Andrew Forster 01387 253383 andrew@dgaa.net	£35,000 / £16,800	nil	
Dumfries And Galloway Youth Talent Cd	New compilation CD and website download of youth music talent	Bruce McKenzie 01387 253383 bruce@dgaa.net	£17,790 / £8,895	nil	
Burns And Rivers Project	15 Nith valley schools learn about Robert Burns and river Nith; ceilidhs and song	Lesley Pinder 01387 253383 lesley@dgaa.net	£51,900 / £15,000	1%	150
Communities On The Edge	Matching country estate resources with community enterprise needs	Pip Tabor 01750 725154 piptabor@sup.org.uk	£35,166 / £12,000	1%	120
Southern Upland Way - User Study	Collect info to market long distance path	Pip Tabor 01750 725154 piptabor@sup.org.uk	£23,350/ £10,000	10%	1000
Festival Promotion And Evaluation	Review of 6-8 regional festivals	Helen Voce 01387 253383 helen@dgaa.net	£7,500 / £3,750	nil	
Feasibility Study For Arts And	Tourism potential of art-in-the-landscape (Goldsworthy, Jencks)	Kate Denholm 01387 702206 Kate.Denholm@crichton.co.uk	£55,000/ £11,000	1%	110

Cultural Centre					
Working Towards Best Practice	Competition for best farmland birds, woods/hedges, wetlands and drainage	Kirsty Hutchinson 01387 760576 dumfries.galloway@fwag.org.uk	£61,399.25/ £30,699.62	10%	3070
					£18,946

* Figures may be under-estimated

The table suggests that if Galloway Leader+ projects had taken place within a Biosphere Reserve, they may have been awarded a (conservative) additional £18,946 during the 3 year period, i.e. an additional £6315 per year.

If the Galloway Hills had become a biosphere reserve, applications would have been made for specific biosphere projects – visitor centres with shops, walking festivals, cycling events, bunk-house trails, etc, which might have resulted in displacement of some of the above projects. However, our assessment above still stands: if there was a local biosphere reserve, community development projects might have had a conservative additional £6k income per year.