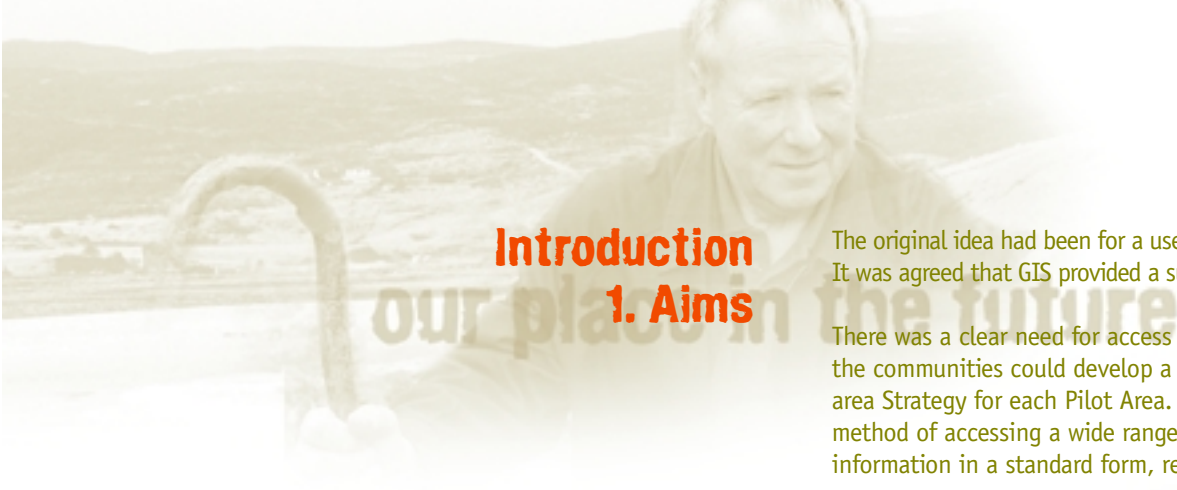
GEOGRAPHICAL INFORMATION SYSTEM PROJECT REPORT

Dùthchas
Our Place in the Future

Contents



Introduction
1. Aims

The original idea had been for a useful 'information strategy'. It was agreed that GIS provided a suitable method.

There was a clear need for access to information so that the communities could develop a relevant and accurate area Strategy for each Pilot Area. A GIS system provided a method of accessing a wide range of different kinds of information in a standard form, related to each Pilot Area.

In view of the large amount of data held in a wide variety of forms by a range of different organisations, an important aim was to find a way of bringing this information together in a useable form. At the outset a GIS system seemed a good way to achieve this.

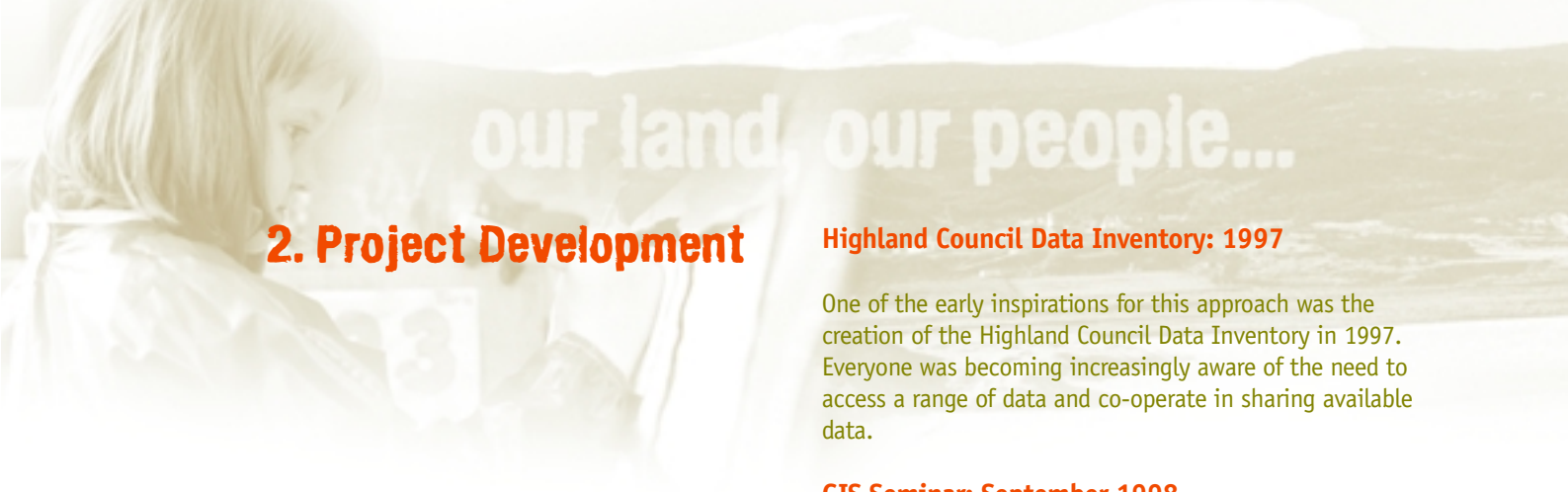
The Duthchas project focuses on participatory methods therefore the GIS project provided an opportunity to explore the opportunities and barriers for participatory GIS. To date GIS has remained very largely the preserve of public agencies and academic institutions.

An experiment in participatory GIS was a logical aspect of the drive towards participatory approaches which has relevance beyond the Duthchas Project itself, particularly for Council Community Planning.

It is well known that the information currently held in a GIS format in the Highlands does not include crucial local knowledge and local information of relevance in developing local strategic plans. This is the due to the fact that the Public Agencies responsible have collected data for certain purposes and within tight financial constraints. Collecting local detailed data is time-consuming and expensive for Agencies covering large geographical areas. It was felt that a local GIS system might also contribute to the creation of this sort of data and hence communicate this type of data to agency Partners.

A key aim of the Duthchas Project was to facilitate a better flow of information between agencies and communities. It was hoped that the GIS project could be a key method in achieving this.

The Duthchas Project was working in 3 remote rural areas. New technologies offer opportunities to overcome some of the disadvantages of distance and this project provided a way of testing to what extent GIS might be appropriate for this.



2. Project Development

Highland Council Data Inventory: 1997

One of the early inspirations for this approach was the creation of the Highland Council Data Inventory in 1997. Everyone was becoming increasingly aware of the need to access a range of data and co-operate in sharing available data.

GIS Seminar: September 1998

This seminar was arranged to explore a suitable way forward for the information strategy with key partners and organisations with relevant experience. The Seminar focused on achieving the following outputs:

- Agree aims of the GIS
- Identify key development stages
- Identify key decisions to be taken
- Examine issues relating to continued provision and extension of GIS
- Identify the implications of 'ownership' issues
- Seek innovative approaches
- Identify hardware and software requirements
- Identify training requirements
- Plan timescales
- Identify resource requirements
- Identify collaboration opportunities
- Agree next Steps

The conclusions of this Seminar were that the following options needed to be examined:

- Project owned GIS
- Partner owned GIS
- Contracted issue specific GIS
- GIS led by one partner

IT Conference: August 1999

This conference was held jointly by the Duthchas Project and Moray Firth Partnership. The Conference Aims were to:

- Explore how community information needs can be met through the appropriate use of information technology, in such a way that it enables local people to make informed decisions on planning for sustainable development.

- Raise awareness of the potential and the problems of using IT to meet community information needs

- Identify good practice and lessons learned thus ensuring resources are used to the full

- Stimulate ideas on how the Duthchas Project and Moray Firth Partnership can each take forward the community information system elements in their work

- Stimulate ideas more generally on how communities and agencies/local authorities can take advantage of community information systems in developing their areas sustainably

The Conference was very useful in identifying other projects where participatory GIS and technological solutions to distance and exclusion had been tried. These examples are:

- Craigmiller Community Information System
- Electronic Community Networking
- Six Villages Community Websites
- Information Technologies for Communities: Web-based Approaches to Public Participation (School of Geography, University of Leeds)
- Moray Council Website
- The Scottish Parliament and Local Democracy
- Norway Community Council GIS & Internet
- TITAN
- Assynt Crofters Trust: STEM
- Virtual Slaithwaite: Planning for Real – Geography Department, University of Leeds

For details please refer to the Seminar Report: "Information for Communities – You Know I.T. Makes Sense: Meeting community information needs through new technology"

The findings of this Conference can be summarised as follows:

Aims & Aspirations

- Focus on a well defined purpose
- Don't expect too much
- Take your time
- GIS is an addition not a substitution for other forms of consultation

Participation & Access

- Decide if you will concentrate on a limited group or everyone in each area
- Identify users and what their needs are – be led by that
- Top down approaches limit success – bottom up stand a better chance
- Involve people from the start – focus on who it is for and how it will be done
- Consider Internet options to broaden access
- Be aware that at present only 25% (1999) of the population have access to Internet, and this group is mainly 'professionals'

Capacity Building

- Training – we expect to have to learn to drive but sometimes assume that everyone should be able to 'do' computers
- On-going Support: Allow plenty time for people to familiarise themselves with the technology
- Understanding the data – and what it can do – is another whole task
- People will only create new local data once they are comfortable with the technology AND have grasped the potential of GIS
- Spatial Cognition issues – many people are not used to reading maps – it might be a new language

System Tech Spec

- Establish a medium between hi-tech equipment & low tech understanding – don't get hung up on technology
- Beware of 'netties' and computer enthusiasts – don't make anyone indispensable and hence limit access and capacity building
- Issues of prototype: The protoype application envisaged for Duthchas used Microsoft Visual Basic & ESRI's Map Objects but this was not a full GIS - more a map viewer
- Make sure your info system works – glitches and crashes ruins confidence in new users

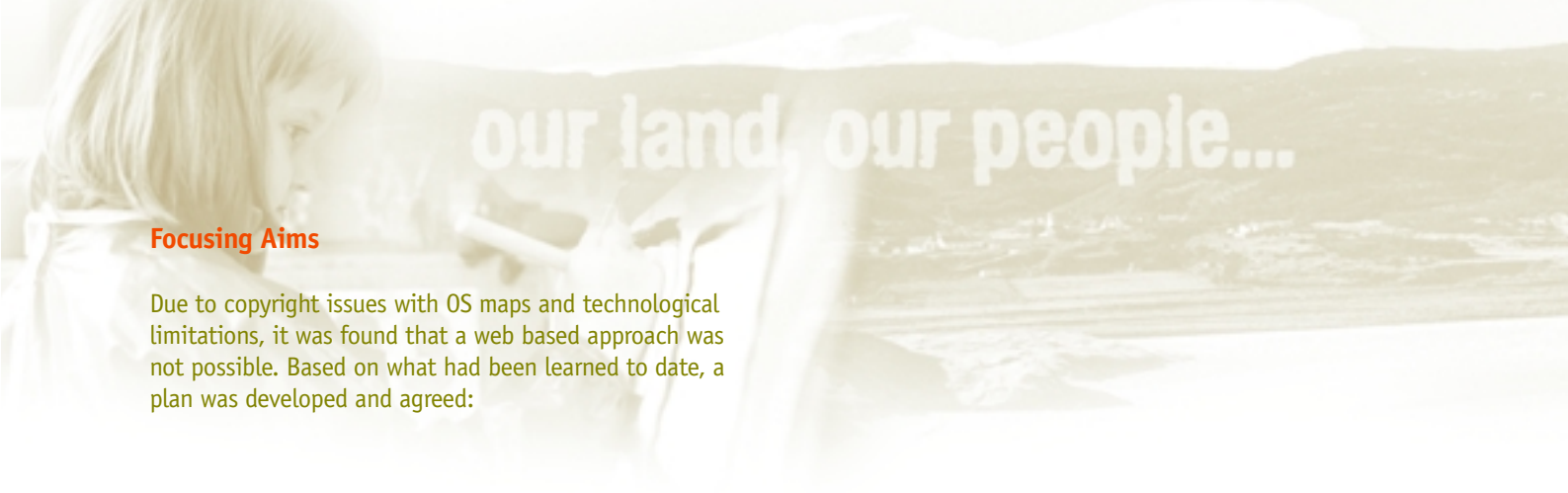
Data

Datasets already loaded: SSSIs, archaeological sites, estate boundaries, rights of way etc
Duthchas does not yet have full data sets
Potential for creation of new local datasets

Legal aspects

OS Copyright continues to pose problems, particularly for website approaches
Ownership of data is an issue to be resolved
For continuation, ownership of the system is an issue

Again for further detail please refer to the Seminar Report: "Information for Communities – You Know I.T. Makes Sense: Meeting community information needs through new technology"



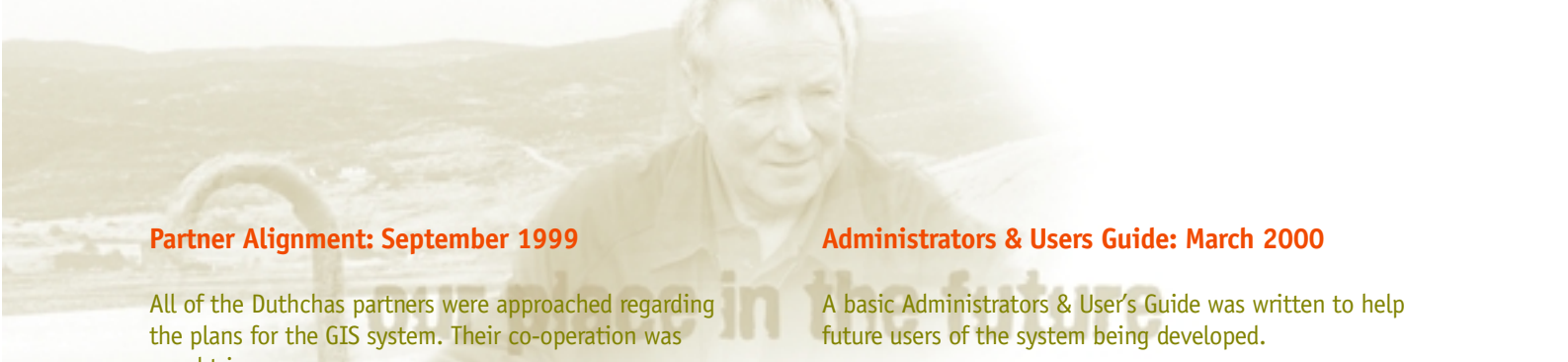
Focusing Aims

Due to copyright issues with OS maps and technological limitations, it was found that a web based approach was not possible. Based on what had been learned to date, a plan was developed and agreed:

GIS Aims	Relevance to Duthchas Objectives	How can we do this?
instigate participatory GIS	Innovative	Work with 1 Strategy Group in each area
Link 'global' & 'local' thinking group	Using new technologies to overcome 'distance'	GIS content & design used by local community
Support the development & implementation of sustainable strategies	Implementation	GIS approach tested by Strategy Group
Provide local access to agency approaches	Bottom-up approach	Agency datasets loaded onto laptop
Provide information in new 'user-friendly' format	Innovation	Interactive GIS format
Integrate wide variety of data in 'user-friendly' form	Joined up thinking	On laptop
Facilitate community contribution to development process	Participation	Strategy Group
Facilitate input of locally created data	Bottom up approach	Agent & Strategy Group
Document the difficulties of achieving this	Barriers	Appraisal by users, PACs & Agent
Assess usefulness of current GIS facility for bottom-up development each area	Tools for change?	Feedback from Agent, users & Strategy Group in each area
Assess usefulness of current datasets for community project needs	Strategy alignment & communication	Feedback from users, PACs & Agent

Further discussion resulted in a very tight focus on a particular Strategy Group in each area, but with an aim of outreach to others where possible. A suitable 'Agent' for each area was sought. The Agents are all people who are active in a number of ways in their own communities and work with IT daily. These were people who were accustomed to helping and training others in IT or using IT for the benefit of others. All three were also aware of the Duthchas Project and its aims.

Area	Topic	Area Agent
Trotternish Peninsula	Trotternish Trails & Interpretation	Alastair Nicolson
North Uist	Tourism using our Unique Features	Neil Nicolson
North Sutherland	Sustainable Landuse & Renewable Energy	Steve Warner



Partner Alignment: September 1999

All of the Duthchas partners were approached regarding the plans for the GIS system. Their co-operation was sought in:

- providing information about datasets or metadata
- explaining how each Partner managed their data
- negotiating access to relevant datasets for community use through GIS

At this point it become very clear that while the Partners were willing to help, each agency created and managed datasets in a different way according to their own remit. Some data was confidential in view of the Data Protection Act and client needs. Much of the data held by Partner agencies was not in a form which is ready for digitisation.

It was clear that so much potential data existed that it would be necessary to have a very particular focus in order to identify exactly which datasets it would be worthwhile inputting into the GIS system.

It was also noted that since data is constantly changing, there was a danger that the data on the Duthchas GIS system would become out of date

On a more positive note, the Highland Council had already brought together a significant array of data for their own needs. However the needs of North Uist were more difficult to meet because CNES used a different type of software from Highland Council and had not progressed towards use of GIS to the same extent.

Bearing in mind comments from the IT Conference and discussions with Project staff, it was decided not to use a Map Objects application but to develop a customised version of ESRI's ArcView GIS instead. The key benefit would be the ability to digitise new data.

ArcView customisation was carried out by Highland Council and by Geowise Ltd, an independent GIS consultant from Edinburgh. This customisation was required to provide simple tools to meet the Project's needs and to minimise training requirements.

Administrators & Users Guide: March 2000

A basic Administrators & User's Guide was written to help future users of the system being developed.

Training Staff & Agents: July 2000

The Agents worked with the PACs to address the following questions:

1. In what way might GIS be relevant to your Strategy Group?
2. What sort of data would your Strategy Group be interested in?
3. Come up with 3 questions which your Strategy Group might wish to answer using GIS
4. What difficulties do you envisage in using GIS in this way?

The Feedback Session yielded the following:

Question	Trotternish	Sutherland	Uist
1. In what way might GIS be relevant to your Strategy Group?	GIS is superelevant & 'the' tool. GIS provides an 'eagle's eye' view Approach has to be comprehensive We should be able to identify gaps in the present knowledge We should be able to provide selective snapshots for different audiences	It is going to give focus & detailed detailed info for sustainable Landuse/Renewables 'Ultra'relevant!	Help with Demo Projects Realise potential of GIS
2. What sort of data would your Strategy Group be interested in?	The Trotternish Ridge – our area's most important feature Birds/Wildlife Geology & Palaeontology Cleared Settlements People's 'Marks' – eg. Martin Martin's House Archaeology Landownership Conditions & Restrictions of Sites for development Activities – Pony Trekking; Whitewave activities Toilets; Coffee; Hotels; Camping 'What's On' – too tricky to achieve just now	Landownership Geology Flora/Fauna Landuse Crofting tenure RSPB Areas Deer management Water Quality Areas which cannot be changed Biomass/Wind Owned & How worked Which areas can & cannot be developed	Accommodation Archaeology Wildlife Loch Fishing Trails Guided walks Beaches Services Destinations Events/What's On Website use with GIS?
3. Can you come up with three questions which your Strategy Group might wish to answer using GIS?	1. Inventory of existing resources and features; 2. Classifying their appropriateness for our Group; 3. Pin-point a theme/themes for Trotternish so we can say with confidence...	1. Current landuses & ownership; 2. Land available for development 3. What is the best use? 4. Which areas are most suitable for which type of development?	1. What can the maps be used for? 2. Can they be put on the Internet? 3. Can tourists/ visitors access them?
4. What difficulties do you envisage in using GIS in this way?	How simple will it be to use? What sort of editorial control and accuracy can we achieve? How do we present the information in view of copyright?	Lack of available information that we need; Getting the community involved; The system as it stands has not been designed to answer our specific questions;	The short term life of the system.
Who else do we want to contact?			Schools; Amenity Trust; Council

Jon Shepherd commented on this Feedback Session, highlighting some of the problems involved in accessing datasets. We currently have no access to Geological data for instance. This is a matter which we might want to comment on at the end of our GIS project.

Some possible outputs were discussed:

- Identify data gaps.
- Create pressure on public agencies to met local needs.
- Find a way of using this approach after the project ends.
- Explore who could update the system after the project ends.

Jon Shepherd then spent the rest of the day training the Agents on the GIS system.

Area Projects

The Area projects were started straight after this Training Event. The next section details the result of this.

3. Area Reports

Introduction

This section details the work done in each area.

Aims

North Sutherland

The GIS Project is part of the wider investigation into assisting and encouraging sustainable development in North Sutherland. In July 2000 Steve Warner was appointed GIS Agent for North Sutherland. During the course of the project Steve has worked with Kerry Conlon the local PAC. This report has been produced from their collaboration with additional input and assistance from Meg Telfer.

The Dùthchas GIS Project was initiated to investigate the usefulness and feasibility of providing this type of system to local communities. Allowing community groups to have access to up to date geographical information would allow them to better plan projects that involved the use of land or that may have an impact on the landscape.

The focus of the exercise in North Sutherland was the Sustainable Land Use and Renewable Energy Strategy Group, though many other groups were offered the opportunity to be involved.

Trotternish Peninsula

This was a Pilot project to assess the suitability of Geographical Information Systems (GIS) for use by the Trotternish Trails and Interpretation Group as a local community tool in developing their strategy as part of the Dùthchas project. Our aims were:

- To assess the usefulness of GIS as a local planning tool for the Dùthchas project.
- To assess the accuracy of current datasets and highlight requirements for the creation of new local datasets.

North Uist

The Dùthchas GIS Project was set up in North Uist to see if the software would help promote Tourism using our Unique Features. In July 2000 Neil Nicholson was appointed GIS Agent for North Uist, during the course of the project Neil worked with Caitriona MacCuish the local PAC.

The aim of the GIS Project was to investigate the usefulness and feasibility of providing such a system for use in the tourism industry for North Uist. To do this a user friendly and informative package would be put together, with a view to taking the idea forward at a later stage as a potential web-site development.

Description of Work

North Sutherland

After the initial training and briefing session, the laptop PC with the software was left at the Naver Teleservice Centre in Bettyhill to ensure it was available to anyone who wished to try it or have a demonstration.

Initially sample maps showing different data sets and invitations to view the software were sent to the following groups:

- Durness Community Council
- Melness, Tongue and Skerray Communitiy Council
- Skerray Historical Society
- Bettyhill, Altnaharra and Strathnaver Community Council
- Strathnaver Museum, Farr
- Melvich Community Council
- Strathy and Armadale Hall Committee
- Strathy and Armadale Community Council
- Strath Halladale Hall Committee

The sample maps were also sent to the individual members of the Strategy Group.

Ms Kerry Conlon and Mrs Meg Telfer were given a demonstration of the software so that they were conversant with its capabilities.

A number of individuals had informal demonstrations of the software.

Mr Jim Johnston, head teacher of Farr School, reviewed the software; he had previously attended a workshop in Inverness. An invitation for geography groups from the school to try out Arcview was not taken up.

Mr Angus MacFadyen and Mr Bruce Sanderson representing NorCelt and the Skerray Historical Association respectively attended a workshop at the NTC.

The Strategy Group GIS workshop was held on Monday 20th November with Pat Thompson and John Toal attending.

Trotternish Peninsula

A local Agent, Alaistar Nicolson, was appointed during July 2000 to undertake training in the use of The Highland Council ArcView GIS system. He was supplied with a Dell laptop, ArcView software and available datasets for the Trotternish area (see list in appendix), following familiarisation training the Agent was then left to review the datasets in consultation with the Trotternish area co-ordinators and the Strategy Group.

The Trotternish Trails and Interpretation Strategy Group had been previously selected as the Group to undertake this review and assessment. Following discussions on the relevance of GIS the Agent was to assist the Group with identifying the role of GIS to meet their identified objects by highlighting suitable actions and projects. As part of this process the group would review existing datasets, identify any other local data sources that may be relevant and plus requirements for the collection of new data to assist the Group in developing their strategy and initial projects.

In consultation with the Area Coordinators and the Strategy Group agree procedures for the collection, recording and inputting of any data considered relevant.

Test the GIS as a tool for the Trotternish Trails and Interpretation Strategy Group to further develop their strategy by highlighting the agreed themes.

North Uist

After the initial training and briefing session in Inverness, Neil started inputting data which he located by reading books on North Uist and using his own knowledge of the island. The system provided information on many different aspects of island life in an easy to use format.

Subjects covered included

- Accommodation - B+B, self-catering and hotels
- services like shops and schools
- leisure pursuits like loch fishing and walking
- archaeological information

A number of individuals who work in tourism had informal demonstrations of the software.

There was interest from geography teachers from the local community school to try out Arcview but unfortunately we were not able to arrange a meeting.

A Strategy Group GIS workshop was held on Monday 27th November with Mike Boase (Uist 2000), and Isa MacKillop attending.

Achievements & Challenges

North Sutherland

Achievements

Most of those who viewed the software and the maps produced from it were very impressed by the clarity of the information presented. Because the system was quite often left in view in a public area in the NTC it generated a lot of interest though very little of this translated into formal workshops or presentations. None the less, useful comments and suggestions were gleaned from these informal demonstrations.

The software was put to practical use when some maps detailing Farr School and its surroundings were produced.

Challenges

There were 2 main challenges to the success of this project:

- Limited time (contracted hours) in which to achieve the goals. Most of the time could have been spent in obtaining responses from user groups; thus much of this report is based on the limited responses received.
- Poor response from the various groups provided with sample maps; it is possible this could have been improved had their been more time available to follow-up the contacts.

Trotternish Peninsula
Achievements

The Trotternish Trails and Interpretation Strategy Group had a basic understanding of GIS and were aware of the relevance of mapping data prior to the commencement of this project. With the appointment of the GIS agent the relevance of GIS was considered against the Group Objectives and Actions.

The group readily agreed that the GIS should be used to create a 'picture' of the existing resources and special features within the Trotternish area. While a fair amount of datasets currently existed none of these were particularly relevant to this task. Plots were made from the existing datasets to assess there relevance (see appendix), when these were reviewed it was apparent that while the data available was useful none of the dataset contain the required specific information on the trails and special feature of Trotternish. It was agreed that that an audit of local trails and feature was required to provide a starting point and that data collected should be such that it could be mapped using GIS to enable various 'pictures' or overlays to be produced. GIS was seen as being a key tool for the Group and others to being able to 'see' the data and to aid decision making for promotion and development.

Meetings were held with Roger Miket to discuss the Group requirements for data collection plus the specific requirement to be able to list the information collated in a suitable format for input into the GIS.

Printouts were made of the existing data sets to assess their relevance.

Challenges

One of the biggest challenges is the creation of an inventory of the existing resources and special features. The Group has been fortunate in identifying an individual (Roger Miket) able to not only collate the existing information but to classify it in a consistent and suitable format.

While some basic data was available within the existing datasets, such as Archaeology sites, the format was basic and the accuracy of some data was questionable. The Group agreed at an early stage that an updated detailed audit was required before any other work commenced, only then could they consider a theme or themes for the area.

North Uist
Achievements

Everyone who viewed GIS were very impressed by the detail of the information presented, Although there was only 6 days of inputting, there should be a lot more time spent at this early stage - mainly because of the lack of co-operation from other bodies.

Challenges

There were 2 main challenges to the success of this project:

- Limited time (contracted hours) in which to achieve the goals.
- The lack of co-operation from the Western Isles Council - & the time it took to get any sort of information from these bodies. It is only now when the project is finished that the info is starting to arrive.

Views of Agents, Users and Area Staff

North Sutherland
Views of Agent

The ARCVIEW GIS product was used for the project with maps and data provided by the Highland Council. This was loaded on a laptop PC running Windows NT.

For the most part the software ran well and was very stable. The PC did not have enough memory and some tasks took longer to execute than might be considered acceptable. The system quite frequently ran short of virtual memory even though Arcview was the only application that was running.

Those who saw it agreed that Arcview is quite a complex package and not one that can be used without training. If the information was to be made more generally available a simpler form of presentation would be required. Alternatively, Arcview could be operated on a bureau basis with a fully trained operator providing the information and maps as required. The operator would also be able to set up project related data sets to allow groups to present any proposals they may have or try out 'what if' scenarios.

The system is only as good as the data it presents. The accuracy of the data was often questioned and more data sets would need to be made available to increase the relevance of the system.

The following questions need to be answered:

- Who would operate the system and how could community groups gain access?
- How would the data be kept up to date?
- How can additional relevant data be added?
- What will it cost to run and maintain the system and who will pay for it?

Views of User Group(s)

A number of individuals had demonstrations of the software and generally they were quite impressed with it.

All those who attended workshops or informal demonstrations found that the information presented via Arcview was clear and easy to understand. Everyone who saw them thought the printed maps were excellent.

Arcview was viewed as a very useful tool. However, most people agreed that it was probably too expensive to purchase and maintain in a small community. It was also generally thought that, because of the low population in the area, the system would probably be under utilised and would therefore not represent good value for money.

The accuracy and completeness of the data was often questioned, for example the boundary of the Achnabourin Estate near Bettyhill is incorrect.

Jim Johnston thought the software was very impressive and stated that the system could have applications in teaching and learning. He would like to undertake a detailed evaluation of the software. He also thought the maps produced by the system would be very useful as graphics to support funding applications etc.

Angus MacFadyen and Bruce Sanderson both said that the system had a great deal of potential and thought it would be extremely useful for community projects and small businesses. They did question the accuracy of some of the information and indicated that additional and more detailed data sets would make the system more useful; including Walks, Caravan Sites, Horse Riding, Toilets, Fishing, Cycling, Swimming Pools and other appropriate Tourist Information. They also said there should be more detailed Land Ownership or Tenancy information - down to individual crofts and households.

Pat Thompson and John Toal of the Strategy Group were very impressed by Arcview and the data available. However, they did not see any immediate use for it. They indicated this was a tool more appropriate for detailed investigations once the basic objectives and strategies had been defined. They, like others who had seen the system, questioned the accuracy of some of the data sets e.g. Forestry. They also suggested a number of additional data sets:

- Archaeology;
- Geology;
- Genealogy (Clan Areas);
- Highlight walks, paths and summits;
- Grazings;
- Scottish Executive Rural Affairs Department (SERAD) data;
- MacCaulay Land Use Research Institute - Croft Land Use (Aberdeen University);
- Wind Maps (e.g. mean speed and direction month by month);
- National Electricity Grid;
- Climatic Data (Area by Area / Month by Month - Mean Rainfall, Isotherms etc.);
- Terrain Types to indicate suitability for different types of development, e.g. land over or under a certain height, steep hillsides, flow, bogs and marshland, straths and glens and so on.

It was also noted that there was Crofting Commission data available concerning land use that would not easily translate to GIS format.

Views of PAC(s)

The local Pilot Area Co-ordinators were impressed by the system, and its potential. They too found inaccuracies in information available. Although they appreciated the value of the system, they questioned the expense involved in making it available to communities. They doubted whether communities would access the information.

They were disappointed at the lack of response to invitations sent out to view the system.

Trotternish Peninsula
Views of Agent

The agent spent time with the Group and Roger Miket ensuring that the inventory creation would be in a format not only suitable for displaying on the GIS but also useful for Group members as they developed the project. The potential for highlighting selected trails and areas of special interest for further development or in need of protection was emphasised.

While the functionality available within the GIS has been very useful in assisting all parties to focus on the Strategy and to agree the steps required to move towards it, the GIS system has not been able to show its full potential as the data collection audit is still underway. When this has been completed during early 2001, the inclusion of this data within the GIS should highlight how useful GIS will be in the future planning and development of the Trotternish area.

Until this work has been completed it is not possible to evaluate and test the system fully in meeting the requirements of the Strategy Group. Existing datasets will be used to assist the Group during the categorisation stage and when deciding on future projects.

Views of User Group(s)

Due to the lack of suitable data some sample data was created to highlight the potential of the GIS to display the information in a meaningful way. Existing datasets were also used to show how different datasets can be combined to provide an overview that could be used to assist decision making, these will become increasing relevant as the Group move forward from the audit stage.

Views of PAC(s)

See above.

North Uist

Views of Agent

My first impressions of Arcview was the amount of detail you could input and the complexity of the software to do such an operation.

I found the laptop ran too slowly to display the OS Base map, but when you consider the detail of the map and the amount of layers you can have - even a desktop computer would have occasional trouble. The software worked fine most of the time apart from when I zoomed in too close - everything would just disappear.

Arcview would work well in public places like the local tourist information centre where the staff could show tourist's places of interest, accommodation etc.

One of the other problems with this project was the lack of co-operation from WIC, this was due to them using different software to Highland Council, this meant that when I got my laptop all that was on it was Arcview and an OS Base map. I feel that this and other bugs should have been ironed out before I got my laptop.

The strategy group were very fascinated with GIS and its capabilities and thought that in would be very useful in the right environment

If Arcview is to be used in the future the following questions need to be answered:

Who would keep the data up to date?

What will it cost to run and maintain the system and who will pay for it?

Views of User Group(s)

A number of individuals had demonstrations of the software and were very impressed with it.

All those who attended workshops found that the information presented via Arcview was clear and easy to understand.

Arcview was viewed as a very useful tool. However, most people agreed that it was probably too expensive to purchase and maintain in a small community. It was also generally thought that, because of the low population in the area, the system would probably be under utilised and would therefore not represent good value for money.

Mike Boase of Uist 2000 thought the software was very impressive and stated that the software could have purposes in teaching and ICT staff as well as tourism.

Views of PAC

I feel that it would have been an advantage to the project if the PAC's had also had some training on the GIS – this would have helped when dealing with the agent and also when answering questions from the various Duthchas groups such as the PAAG or the strategy groups.

North Uist had a very different (and difficult) situation in that the system was not fully operational when it was passed to the agent. Therefore the agent had to spend a considerable amount of time inputting basic data that was already on the Skye and Sutherland system. This probably meant that the full potential of the system was not recognised; if the agent did not have to spend time on the basic data, more interesting layers could have been input.

Problems of copyright and ownership (of software & hardware) after the end of the Dùthchas project mean that the future of the GIS is unclear. The strategy group members consulted felt that it was important to retain this facility within the community and to ensure that people have access to it. However as it is not very user friendly at present it would have to be housed where trained staff are available to help members of the public who wish to access the information. Funding for the equipment and for training and staff are another issue, which has not been resolved.

Members of the PAAG felt that it was important that local knowledge was reflected on the system as well as agency data – this would make for a more exciting and useful system, as at present that is the sort of information that is often not recorded.

Potential for Local Use

North Sutherland

This type of Geographical Information System is highly relevant when dealing with local land use development issues. It would be a good tool for answering specific questions about the availability and suitability of areas and sites for certain types of development. It could be further used as a tool for developing proposals, showing where they could be placed and demonstrating their impact on the landscape and the community.

Trotternish Peninsula

GIS is a key tool that can assist with classification of data, assisting local group members and others to view the overall data as a 'picture'. When initial data has been collected and classification categories agreed with the Strategy Group the GIS should then prove invaluable in being able to display this information in a 'user friendly' visual format to group members, local individuals and others. This should result in wider community involvement within the project, verification of the existing data and increase awareness of the special features with Trotternish.

Due to the early stage of relevant data collection, classification and input into the GIS it is not possible to assess how individuals will be able to interact with the system in isolation. All data viewing and interpretation to-date has been via the local Agent. Those viewing existing data available on the GIS have been able to see the relevance of GIS as a planning and development tool for both Agencies and Communities.

Potential exists for the GIS tool to be used in a similar way to assist other Groups involved in local community planning tool to be able to visual the interaction of different datasets and influence future developments.

North Uist

The potential for Arcview for local use would be in schools where maybe students would input certain data which would be available to them. The other local use would probably be in the local TIC office where locals and tourists would both benefit from the software.

4. Lessons Learned

Participatory GIS

It is very difficult to deliver participatory GIS as part of a time limited Project. The time limits make it difficult to overcome then following challenges:

- Lack of knowledge of what GIS is and what it can do
- Lack of confidence in using new technologies
- Difficulties in perceiving the potential of GIS for specific local needs
- Physical distances to travel for Agent and Users even when using a laptop version
- Pressure on voluntary time which means potential users take a long time to find time to come forward
- The timelag involved in inputting new data, once new data needs are identified
- The timelags involved in a Strategy Group then using the new data and moving on to the next step due to pressure on voluntary time and distance to travel for meetings

Supporting Strategy Development

Strong potential for this has been illustrated, but again an on-going commitment would be needed to make the most of this. At the time when the GIS was tried, the Strategy Groups were just beginning to develop their plans in much more detail. It is clear that it takes time to identify which new data sets are needed, establish whether they can be accessed, input that data and then reconvene to use the data.

Facilitating Community Involvement in Planning

There is strong potential here, as illustrated in the comments from North Sutherland. There it was seen as a good tool for exploring the availability and suitability of land for particular defined types of development. The system's greatest strength – not yet used due to lack of time – is the possibility of illustrating ;"what if" scenarios in planning things like Trails, Renewable Energy, Transport, Housing or Waste Disposal. The visual impact of that would be much stronger than comparing a Council Local Plan with the ideas on the table. The immediacy of this would be worth pursuing in the long term.

Capacity Building

In terms of IT, the gains here will prove to be exponential, if community access to ICT is prioritised. The work of the Sutherland Essential Services Strategy Group is relevant here. Should community access continue to broaden, larger numbers of people will become comfortable with use of PCs and websites and any further GIS will be more quickly taken up. However a long term approach would still be necessary. Meantime awareness of GIS and its potential has been raised in a limited way and area specific suggestions for methods of building on that have been suggested.

System Tech Spec

All viewing of data was facilitated by the local Agent. Participants were not trying to use the system themselves. The system was not a full GIS system, but more a way of viewing multiple data sets in a map form with the option of inputting more data as required.

A great deal of time was taken up investigating what sort of system would be suitable and then creating that system. This proved to be difficult and, in a time limited project, reduced the time spent on understanding users interests and needs and the time for which the system was available to the users.

The use of laptops did help in making the system mobile and accessible. The use of an Agent to facilitate, input data and display different types of maps helped in dealing with the difficulties of 'new technologies' and the challenge of understanding the system's potential.

A web based version would have made it more accessible on a more regular basis because people could have suited themselves in terms of timing instead of being confined to certain places and times. It would also have helped to publicise the material as it was developed.

The Agents found that the laptops did not have quite enough memory to run the system easily and this was frustrating.

The users and Agents agreed that Arcview was quite a complicated package which none of them could have used without training and time. The role of the Agents was therefore crucial.

'Old' technologies still have a place in the drive to make information available and share information. The Skye Data Atlas is a good example. Web based versions of this, linked with open community access to IT have much to offer. Web based versions can also be update more easily, but it needs to be someone's job to do this

Data Issues

In Sutherland the accuracy of some data was questioned and it was clear that a lot more data would be needed to maximise the system's potential. It is not clear whether it will be possible to access all of the relevant data. In North Uist the Agent and Group started with blank maps and no data at all. This caused huge frustration and required an enormous amount of work from the Agent to create anything to view at all. This surely goes to the heart of the data problem. No-one seems at present to be able to overcome the huge difficulties posed by the fact that different organisations use incompatible software and data gathering and storing systems.

For long term use the users and agents raised the issue of how data could be kept up to date. The wide range of data sources makes this seem to users and Agents to be a huge challenge, the scale of which we can't fully engage with.

Likewise, it is not clear to the users who to contact about inaccuracies, in order to correct them. Many agencies could gain much from that sort of very specific feedback.

Locally Created Data Sets

It is clear that there is huge potential for this – the experience in North Uist and Trotternish illustrates this. This data could then be made available to relevant agencies. The implications of the Data Protection Act would have to be explored and overcome. Again lack of time has made it impossible to follow through on this, but some sort of continuation might yield very interesting results.

Integrating & Accessing a Range of Agency Data

The system was useful in achieving this, but a lot of time is needed to identify ongoing data needs and then meet them. The fact that different organisations collect, store and use data in incompatible ways is a serious problem.

Legal Aspects of Data

This subject throws up more questions than lessons learned. The implications of the Data Protection Act need to be explored. What are the legal implications for locally created databases? Is it likely that the copyright problems with geological information and other sorts of data can be overcome? What sort of data will always be unavailable even if the problems of mutually incompatible systems were overcome?

Overcoming Distance

This system does have potential for overcoming the barriers caused by distance. Instead of going into a number agency offices and libraries to get information, a huge range of pertinent information can be stored and displayed in a map based format.

Tools for Change

This approach has shown potential for this, but it would need to be used in the long term to gain full benefit and involve all the relevant parties locally.

5. Recommendations

The recommendations from each of the Pilot Areas are detailed below.

North Sutherland

This type of system is too expensive and complex to be run by individual communities. It would be much more cost effective if such a system could be provided by a government agency such as HIE, or a consortium of the Highlands and Islands Local Authorities.

The central body running the system would be responsible for the collection and recording of data. They would co-ordinate with national and local agencies to ensure that all relevant data is available and accurate. Community groups and businesses could make requests for particular data sets to be included.

Local delivery of basic information with very simple options could be made via the Internet; most community groups and business have access to a computer connected to the Internet.

Special arrangements would be required for looking at more complex data. A computer system with a fast connection to the server holding the system would be required. This is probably available in schools, colleges, the LECs and Service Points as most of these have ISDN access to remote networks.

The preparation of special data sets for particular groups would be by special arrangement. This would probably be a chargeable service.

It may be appropriate for sub-sets of the data to be made available on portable PCs for the use of groups embarking on major projects. Training will have to be provided to allow the groups to obtain the maximum benefit from the software

Much of the funding for this system would come from government development funds. Community groups and businesses would be expected to make contributions towards the cost of any data prepared specifically for their own projects.

Trotternish Peninsula

A key use for the future will be in the promotion of the results to those inside and outside the area. The inclusion of relevant data overlays to assist the future decision making process of all groups, Agency or otherwise is recommended.

One of the difficulties to be overcome is access to current data since many of the available datasets are maintained by different groups and for differing objectives.

The local dataset being developed by the Trotternish Trails

and Interpretation Strategy Group should be further enhanced to include graphics/pictures and links to other relevant data. In addition an online version should be created containing specific elements of the data with options to focus or zoom in on areas of interest plus link to other relevant information, features and facilities. By displaying in this manner it is possible to highlight the key features that are suitable for development and protect those that are more fragile.

It is also important that local communities and individuals have access to view and feedback on the outcomes, this could be by viewing at fixed locations within Trotternish, schools, and/or local roadshows.

Unless a means is found to maintain and manage the dataset is will only be a 'snapshot' in time, some means must be agreed to update the classifications as circumstances change.

North Uist

This type of system is too expensive and complex to be run by individual communities. It would be much more cost effective if such a system could be provided by a government agency.

Could the information be transferred from Arcview to a website?

Arcview is probably too complicated for first time users which is who we're aiming at, so could Arcview be simplified i.e., working mode and demo mode?

To have a computer that can handle with ease the complexity of Arcview.

Better communication between councils.

Summary

In summary we recommend that:

- Continuation of access be arranged in the long term since local organisations and communities cannot arrange this for themselves
- Funding should be sought to make this sort of service available as part of the drive to make ICT in general available in remote rural areas
- A central body takes responsibility for updating data and accessing/inputting relevant data
- Where permissions allow, local businesses should be able to access useful material
- A limited web based version be produced and run by the same central organisation
- Special arrangement be made for specialist access, with expert support provided
- The limits of data access due to copyright, different methods of collection and use and the Data Protection Act should be explored, established and explained
- Agencies should be made aware of the useful datasets which can be created locally when funding and expertise are in place
- A GIS system should be used to clarify 'what if' scenarios in local planning and for local groups, especially Strategy Groups
- Concerns over the technicalities of an appropriate system should not be allowed to detrimentally affect the need to spend time getting to know the users and the barriers to use
- GIS will never be a substitute for other forms of information and consultation. GIS can help in detailed, focused local development and limited web versions can provide more open access where ICT access is being promoted and human beings are employed on the ground to provide support, capacity building and feedback.

6. Conclusions

The conclusions from each area are detailed below.

North Sutherland

Sustainable development based on sensitive exploitation of natural resources, the landscape and the area's natural beauty is essential if the communities and the way of life of the Highlands are going to thrive in the twenty first century. A Geographical Information System can provide appropriate information to many users at many levels. In addition to being a tool to provide information it can be taken further and be used as a planning and consultation tool.

This type of tool should be provided by central government to assist fragile communities in developing their full potential. This should form part of the development aid package provided through the Enterprise Network or Local Authorities, as this type of tool is too complex and expensive to be utilised effectively by community groups or small businesses on their own.

It is recognised that because such a system is too expensive to be placed into individual communities it would provide the greatest benefit if it were operated from a central point with good access from all remote areas.

Trotternish Peninsula

The Trotternish Trails and Interpretation Group were able to identify at an early stage where the GIS could be used to support the work of the group. Having agreed on the base data requirements the Group highlighted need to compile a new local dataset. Unfortunately due to time constraints the detailed audit will not be completed until early 2001, only when this base data has been compiled and categorised can the first GIS test data be developed. Without accurate locally relevant data it is not possible to fully evaluate the usefulness of GIS within the Trotternish Dùthchas project..

The GIS should prove invaluable as the Group move forward from the audit stage through classification and onto promotion of the selected themes and particular features.

More time is required to allow the Group to develop their dataset and incorporate it within the GIS and then fully evaluate its effectiveness. It is recommended that resources are made available to assist the Group implement a GIS using the dataset when available and then to evaluate the usefulness of this.

North Uist

Tourism using our Unique Features, The Geographical Information System can provide tourists and locals with a variety of information, at a click of a button. At the moment Arcview needs more programming to iron out little bugs that annoy the user and becomes not very usable.

On the whole I see Arcview as a very good tool in it's industry, but think that a different program which would be more user-friendly i.e., a web based program where it would contain photos and info at the touch of a button. This would also help as just about everyone has a computer that can use the internet.

Summary

In summary we conclude the following:

- GIS should be used to assist fragile communities develop their full potential
- Using GIS provides useful experience – it is a transferable skill
- Much thought needs to go into how GIS might be delivered locally in the medium and long term
- Continuation of GIS at the local level provides the opportunity to improve data collection, correct data errors and create new data sets
- More limited web based versions should be developed and piloted in these areas
- Difficulties in different systems among agencies should be overcome by agencies
- GIS has great potential in measuring the impacts of the Area Strategies through mapping of Area Status Indicators and Topic Indicators through time
- Provision of GIS should be viewed as part of a much needed drive to provide adequate ICT in North Sutherland, Trotternish and North Uist

This pilot has illustrated the potential of this tool – now it is time to find ways of bringing that potential to fruition.

Appendices

Examples of Maps Created

North Sutherland

Highland Interpretative Strategy (HISP)
Sites of Special Scientific Interest (SSSI)
Bettyhill Orientation Centre
Farr Secondary School
Borgie Forest
Forests
Parishes
Parishes & Villages
Land Ownership

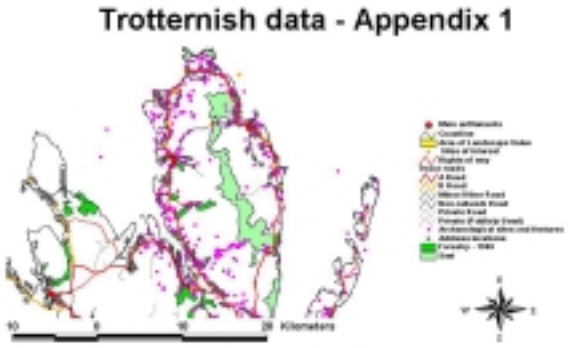
Trotternish Peninsula

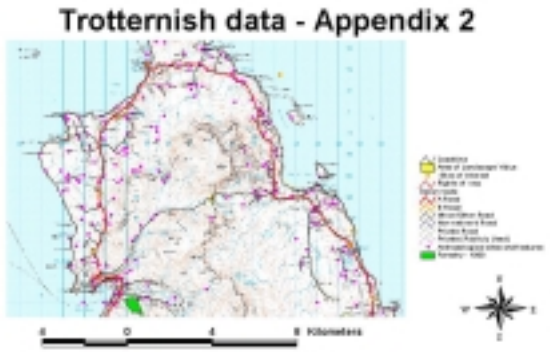
Layouts for existing datasets, namely

- Settlements and roads
- Land Ownership (+ 100Ha)
- Highland Interpretative Strategy Project (HISP)
- Areas of Great Landscape Value (AGLV)
- Peatland vegetation
- Special Areas of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Rights of Way
- Forestry
- Archaeology Services Sites and Monuments Records (SMR)

Layouts from new datasets

- Extract from Skye & Lochalsh business directory (2000)
- Test showing example trails





North Uist

Not available

our place in the future

Life

Dùthchas
Our Place in the Future

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