

Consolidated Progress Report

November 1995 to October 1996

Detailed Visual and Amenity Design Guidelines for Forestry:
Optimising Rural Resource Potential
- FORAM -

(AIR - CT94 - 1229)

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Chapter 1 - Summary

The Consolidated Progress Report 1996 contains preliminary results and drafts of all research work done by the German FORAM Team between November 1995 and October 1996. All research activities are related to tasks and objectives defined in the Technical Annex of the FORAM Design Project and common agreements during 3 project meetings since the beginning in November 1994. A detailed workplan informs about our activities throughout the year. In the respective chapter all results are described in more detail including the used methodology. The chapter "Project Research Ahead" lists activities and objectives for the next project period and finally the chapter "Dissemination" shows how the work done has been published and disseminated. The attached Sub Annex section inter alia contains a filelist of all mentioned files in the text.

Note that all following filenames in brackets are grouped to their respective chapter in the Sub Annex. All files are stored on the FORAM ftp server in Freising.

To read and/or download it type:

`ftp://mohr@abies.lnn.forst.uni-muenchen.de/usr/users/mohr/bayern/report96`

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Chapter 2 - Introduction

The workplan gives an overview of our research activities from November 1995 to December 1996. The work was focused on research according to the objectives described in the Technical Annex of the Foram Project. Additionally there have been a lot of activities in terms of general project management, communication and organisation:

Maintenance of contacts with all FORAM project partners and our cooperative partner Prof. B. Koch and P. Reidelstuerz of the University of Freiburg. In order to test our methodologies in the field we are cooperating with Dr. U. Pröbstl, a landscape architect concerned with practical landscape planning in the Bavarian Alps (see chapter „Research Projects Ahead“).

Maintenance of computer network, software and hardware. We purchased ArcView 3.0, á user-friendly software to display, analyse, overlay and design ArcInfo coverages and grids and other geographical data formats like DXF, Erdas, TIFF and JPEG images. For advanced data transfer we investigated the capabilities of the internet and the browser software Netscape, which involves the ftp software and facilitates the file management of our common ftp server in Freising. This also includes the design of this report (report96.doc) in HTML internet language (report96.htm) and the idea of a new way of digital data exchange (read1st.htm).

Workplan from Nov. 1995 to Oct. 1996

Tasks	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Public Survey at Spitzingsee	*	*	*	*								
Digital Landscape Modelling			*	*	*	*	*	*	*	*		
Development of Questionnaires for Public Preference Survey										*	*	*
Conceptual Design Guidelines										*	*	*
Completion of Photo Collection										*	*	*
Preparation of 3rd Project Meeting						*	*					
Completion of Cost Statement 95/96												*
Completion of FORAM Dictionary								*	*			
Photoshop Landscape Simulations	*	*	*	*								

Meetings and Conferences

Several meetings and conferences have been attended in order to disseminate recent findings and to discuss and refine our own methodologies:

?? Information Meeting „ATKIS-Daten“ of State Survey Branch in Stuttgart/Germany, 16.01.1996

?? 4th German ArcInfo User Conference in Freising/Germany, 11.03.96 - 13.03.96

?? 3rd Project Meeting in Madrid/Spain, 24.05. - 01.06.1996 (see madrid.doc)

?? GIS Conference "Angewandte Geographische Informationsverarbeitung" (AGIT, Applied Geographical Information Processing) in Salzburg/Austria, 03.07.96 - 05.07.96

?? IUFRO Student Excursion 1996 „Land Use and Nature Protection in the Alps“ (International Excursion organised by the Faculty of Forestry, Ludwig-Maximilians-Universitaet Muenchen), 26.08. - 02.09.1996

?? International Symposium „Application of Remote Sensing in Forestry“ at the Faculty of Forestry in Zvolen/Slovakia, 09. - 12. 09.1996 (see poster.doc)

FORAM-Design Report96 Online

Since almost all research data of the FORAM project are digitally processed it is a consequent step to publish and forward research data in their original digital format. Depending on the hardware printing the data means always a certain loss of quality respectively increasing costs for layout and publishing. Digital data which are stored on the internet can be maintained permanently to the latest state of art. Limited data exchange on removable media due to file size and media format isn't a problem any more and further data processing by all FORAM partners is continually possible.

To manage the FORAM data on the German ftp-server, two internet services are helpful:

?? the file transfer protocol (ftp) for simple exchange of data from and to the ftp-server

?? the WorldWideWeb-Browsers Software for multi media and interactive data exchange and communication

WWW-Structure of the FORAM Progress Report 1996

The Progress Report 1996 is designed in HTML 3 (*.htm) language for internet publishing. The introducing file is called report96.htm, it contains a table of content with links to other documents which appear on the screen after a mouse click on the underlined blue link-word. All documents and images may be printed locally.

The report96.htm file and all linked documents are located on the ftp-server at the Forestry Faculty in Freising. To browse through the report96 you may use one of the current WWW-Browsers (Netscape, MS-Explorer, Mosaic).

Since all the web pages are written with the Netscape 3.0 Gold editor we recommend the latest Netscape version.

Note that the online report96 is only accessible with the password for the ftp server in Freising.

To get linked to the report96 type following URL (Uniform Resource Locator) into the command line of your browser:

ftp://mohr@abies.lnn.forst.uni-muenchen.de/usr/users/mohr/bayern/report96/read1st.htm

Typing the correct password leads you to an introducing page. From there you may begin your Online Tour through the report96.

Chapter 3 - Results

3.1 The Spitzingsee Public Survey

The work done contributes to task 2 and task 3.3 of the Technical Annex

3.1.1 Introduction

In Study Area "Bavarian Alps" constructions against avalanches, lanes used for skilifts and for downhill skiing and the increasing number of infrastructural facilities, like roads, parking areas and hotels, along with cattle grazing and its impact on silviculture are typical alpine issues in terms of landscape design (see table "Concept Design Proposals").

Besides the aesthetic impact of the above mentioned issues there is a very important interaction between tradition and culture, ecology and economy, since most of the alpine regions depend on income from tourism. Therefore the public attitude towards the appearance of the most popular holiday landscapes in Germany is essential for the conservation respectively for an adapted design of the scenery. The question of the significance of alpine forests for recreation and the vulnerability of the landscape, ie the way of common perception of landscape changes is of big interest for any further design guidelines. In order to analyse the complex situation in the light of public preferences and the common perception of the scenery we decided to carry out a survey at the lake *Spitzingsee*, the touristic center of our study area. The goal was primarily to find some new answers or to update existing findings and secondarily to gain some experience in interviewing the public by questionnaires. The whole study was organised as a seminar for interested students at our department from November 1995 to February 1996. The study includes the design of a problem orientated questionnaire and the selection and manipulation of adequate images with Photoshop. Paralell to the survey a methodology was developped to inventarise and assess the landscape by experts. This professional assessment approach critically reflects the proposed methodology of the Technical Annex (Sub Annex I; Art McCormack and Tomas O'Leary 1994). According to the ideas of McCormack and O'Leary a Landscape Aesthetic Inventory Form (see German file bewert.doc) was created and finally used for the landscape aesthetic assessment.

3.1.2 The Survey

The survey was carried out on a sunny winter Sunday in January 1996 at 4 selected locations of the *Spitzingsee* area. Every point (at the parking area, on the frozen lake, on the lake shore and on the Taubenstein peak) was equipped with two students. They showed the visitors a set of images and asked the questions of the questionnaire. The weather conditions were perfect and from 10.00am to 04.00pm 94 respondants answered the questions of the students. Before this field survey took place students of the Forestry Faculty were asked by an almost identic questionnaire in the lecture hall. The field survey image set was shown by 2 paralelly working slide projectors.

3.1.3 The Questionnaire and Image Set

The 4 page Questionnaire (see German file fragbog.doc) consists of 15 themes and 23 questions. Besides questions to outdoor activities, visitor frequency, willingness to pay, public preferences towards forest types and the significance of forests, a set of printed images of the area were shown to the visitors. The image set includes 4 pairs of images from the Spitzingsee area, which had been ...

... manipulated:

- ?? View over the lake (panoy.jpg)
- ?? View from *Taubenstein Peak* (skiy.jpg)
- ?? View from gondula to lift station (origin5.jpg)
- ?? View over lake to lift station (origin8.jpg)

... and original:

- ?? View over the lake (panox.jpg)
- ?? View from *Taubenstein Peak* (skix.jpg)
- ?? View from gondula to lift station (versio5a.jpg)
- ?? View over lake to lift station (versio8a.jpg)
- ?? one image with an iron avalanche protection construction (verbau.jpg).

The respondents were asked, which image they would prefer, what would be the attraction of their favourite image and which would be the most disturbing elements. After showing them the photo with the iron avalanche protection construction, they were asked if they would know the use of the construction and if they would think the construction spoils the scenery.

3.1.4 Results

The answers of 94 field questionnaires and 30 student in-house questionnaires were processed with Access 2.0 and Excel 5.0. Already analysed results are presented in flow charts.

Some remarkable facts so far:

- ?? 64% of the students, who are not familiar with the study area took the manipulated view over the lake for the original scenery. Is that how they think the alps typically look like?
- ?? Mixed Forests are generally preferred, but not regionally (chart1.jpg, in Excel 5.0 format: Forsttyp.xls)!
- ?? The significance of alpine forests for recreation is high (chart2.jpg, in German: bedeutg.xls)!
- ?? Information makes an ugly landscape element nice and acceptable (chart3.jpg, in Excel 5.0 format: inform.xls)!
- ?? Female visitors are willed to pay more for maintenance of scenery than male visitors (chart4.jpg, chart5.jpg, in Excel 5.0 format: Financex.xls and Financey.xls)!

3.2 Landscape Modelling

The work done contributes to task 3 and task 4.2 of the Technical Annex

3.2.1 The Spitzing See SBE Model

The periodic Forest Inventory in Germany (Forest Master Plan) also provides foresters and landscape architects with useful forest stand data for the assessment of forest aesthetics. All stands in *Bavaria* are described regarding their species mixture, tree age, applied silvicultural methods, indexed tree density and inherent forest functions (in *Baden-Württemberg* additionally: basal area, number of trees per ha, mean tree diameter and height, volume per ha in qbm, etc. ...).

The appearance of forest interiors and forest from the distance primarily depends on parameters like tree mixture and tree density, i.e. consequently on the silvicultural management. Hence any quantitative aesthetical evaluation has to be based on these measurable parameters. The question for a reasonable weighting of every parameter, i.e. its aesthetic effect on public landscape perception cannot be answered before the improvement of this issue by a public preference survey.

The following evaluation method uses forest type and forest structure for the assessment of aesthetics, where forest type is composed of the parameters tree age, tree mixture and silvicultural management form. The forest structure results from certain stand characteristics (ski lanes, open sites, etc. ...) and structural features caused by some silvicultural treatment forms (seed trees, kernels, etc. ...).

The aesthetical weighting of the parameters was done professionally, i.e. it is based on common research findings and the on the experience of experts. By means of a preliminary Scenic Beauty Estimation Matrix (SBE Matrix, see map15txt.jpg) the evaluated parameters are prepared for further digital processing. The open and flexible matrix form allows to implement later results of the Public Preference Survey easily into this technical procedure as well as further parameters.

3.2.2 2D Modelling

The Forest Master Plan of the Forestry District of Schliersee (1:10.000) was scanned with 150 dpi and saved in TIFF (*.tif) format. The three image files were georeferenced in ArcInfo (command: *register*), with an RMS (Root Mean Square) error of 2.5meter, orientated (command: *rectify*) and compiled to one image catalog (command: *createcatalog*). The forest stands were digitized onscreen with ArcInfo and refined to the Forest Structure Map (see map14.jpg). All stands were labeled with their unique stand number. The stand parameters from the master plan (forest types, forest structure, forest function, stand number) were compiled in an attribute table called wald.lut. With a simple ArcInfo aml file (sbeam1.txt) the SBE (Scenic Beauty Estimation) value was calculated for every stand. Alternatively an aml file with logical operands (if, and, equal, then) is good to order all stands due to their aesthetical structures and to compute the SBE values.

The calculated attribute table (waldlut.txt) was joined to the map (the stand number was used as the join item).

Finally the SBE value was used to colour the SBE-Map of the Spitzingsee area (map15.jpg).

In contrast to the shown evaluation method the example of the SBE Model of *the Upper Danube Valley* (beusbe.jpg) demonstrates an ecological approach to aesthetical landscape assessment.

3.2.3 3D Modelling

The Topographical Map 1:25.000 (map03.jpg) was scanned and georeferenced for digitizing the 20 m contour lines and geodesic points of altitude. A tin was generated with the *arctin* command in ArcInfo. Alternatively different snap options (optimum at a weed tolerance of 20 m) and the *createtin* command, which reads either points or arcs, were tested. The tin can be displayed in arcplot in different modes, aspects and surfaceshades, e.g. as:

?? a mesh along x net (map01.jpg),

?? with altitude information as a fishnet (map02.jpg)

?? a "raw" fishnet (*Upper Danube Valley*, beulat3d.jpg)

?? 2-dimensional like the surfacemodel of the *Upper Danube Valley* (beulat2d.jpg)

By means of the *observerposition* command different views from different key view points can be displayed on the screen, like the fishnet view over the lake (map05.jpg) to the west, which corresponds to the photorealistic view. The combination of this view with the SBE-Map (map15.jpg) and with polygons, which mark view distance zones (viewdz.doc) provides 3-dimensional information (map16.jpg, see also map06.jpg) for the visibility analysis of the area.

3.2.4 Enhanced Surface Modelling

In some cases the surface information from topographical maps and digital surface models of the survey department describe the land surface of the earth and not the vegetation surface. Especially for visibility analysis in a detailed scale this fact may severely influence the quality of the results. To equalize surface models to the desired level and to refine the surface model locally a process routine with Arc/GRID (description in German, howdone.txt) is necessary. In our case the *docell* command was used to adapt the land surface to the vegetation surface, i.e. to the forest canopy. First of all the tin must be converted to a grid, i.e. a lattice using the *tinlattice* command (use *gridascii* and *asciigrd* to eliminate problems). The forest coverage has to be *gridded* with the forest type item, which corresponds to the height (command: *polygrid*). Finally the *docell* aml computes the new surface lattice.

3.2.5 Image Overlay (Raster/Vector Data Combination)

To do landscape aesthetical analysis that gives a photorealistic impression and also enables the scientist to proof the model visually and overlay of photos and other scanned images is worthful. A comparison between the "raw" digital elevation model (map01.jpg) of the *Spitzingsee* area and the "enriched" version (map04.jpg) demonstrates how the combination of different data improves the information received. The most important step for image overlay is the correct measurement of reference points (passpt.txt) in the field by a Global Positioning System (GPS) or from a topographical map. The accuracy of the reference points determines the accuracy of the map overlay. The RMS error is an indicator for the accuracy of

georeferenced images, the smaller the better. The images also have to be *rectified* before you can start the *surfacedrape* procedure. Here are examples of

?? the overlay of an infrared aerial photo (map07.jpg) of the *Spitzingsee* over the elevation model; in detail (map08.jpg)

?? the overlay of the topographical map (map06.jpg) over the computed view over the lake

?? the overlay of an terrestrial photo (map10.jpg) over the elevation model of the *Upper Danube Valley* (map10.jpg). This example shows the difficulties and limits to adapt a terrestrial photo in ArcInfo to the surface model.

3.2.6 Other Computer Approaches

The creation of an anaglyph image of the *Upper Danube Valley* (map11.jpg) was realised in EASI/PACE from PCI by eliminating the blue/red respectively the blue/green channel of a pair of overlapping aerial photos. The same method was used in Photoshop (map13.jpg) for a test site in the *Black Forest* with poorer results. Microstation, CAD from Intergraph, also provides a stereo rendering option for CAD files that delivers very good results. Using red/green 3-D-glasses gives a 3-dimensional impression of the landscape. Overlaying anaglyphs with other ArcInfo coverages in ArcView facilitates 3-dimensional planning. The performance of the BWIN software is the graphical visualisation (bwindemo.jpg) of stand parameters (bwintxt.jpg), a new version with an improved graphic module has been released and will soon be tested.

3.3 Public Preference Survey

The work done contributes to Sub-Tasks 2.1, 2.2, 2.3 of the Technical Annex.

3.3.1 Methodology of Survey

According to F. Petermann (Germany, 1979) and U. Proebstl (Germany, 1988) questionnaire surveys as well as in-depth interviews are two adequate methods of social-empirical research for assessing the public attitude towards a problem which is to assess. While in-depth interviews in certain cases are even a tool to investigate the behaviour of the interviewee, it is not permitted to deduce the respondent's real behaviour from the results of a written survey.

To identify what the public preferences towards forest aesthetics and forestry are, a *quantitative* survey was chosen as suitable tool. The complexity of the questions asked in the survey regarding the project themes is the reasoning behind the necessity of using in-depth interviews as a *qualitative* research study to investigate why the public like or dislike certain forest landscape elements.

3.3.1.1 In-Depth Interviews

During the 3rd Project Meeting held in Spain (May/June 1996) a decision is arisen from diverse discussions between all Partners that within the framework of the *FORAM-Project* in-depth interviews would be a supplementary tool for getting detailed and personal information about what preferences people have regarding forest aesthetics and forestry issues and where these preferences emerge from. This second aspect is quite important in view of further guidelines.

Like group-discussions in-depth interviews can be classified as „exploratory methods“. They are suitable for structuring a new problem which yet has not been clarified, and for gathering a person's deeper opinions and motives if these need to be considered. The advantage is that the interrogator has the possibility to go more into the personality of the interviewee and to identify the reasoning behind stated preferences.

Nevertheless it must be taken into account that for any reasons the interrogator might influence the opinion of the interviewed person. To reduce this danger as well as possible the interviews will be carried out by a well trained and experienced psychologist (Institute of Prof. Keppler at *Stuttgart/Germany*) together with a professional forest scientist from *the Faculty of Forestry / University of Munich* to grant for the expert knowledge regarding forestry issues. A limited number of the local population within the selected Study Area will be invited for carrying out the interviews. The written and spoken comments concerning these issues will be recorded and analysed to identify the reasoning behind the mentioned preferences.

3.3.1.2 Public Survey Questionnaires

Normally a written survey is carried out by a questionnaire which is sent to a limited number of persons. It has to be taken into consideration that the readiness for answering the questions only depends on the accompanying letter and the thema of the survey. One of the disadvantages of a written survey is that often there is a very low return flow rate. This fact

might result in a falsification of the basic random sample and the elimination of the representativeness of the survey.

In order to compensate this problem we have decided not to send the survey questionnaires to a limited number of the national population but to combine the written questionnaire with interviewing people who are taking part in local meetings or conferences, at schools or at the door of private houses. The surveying will be carried out in Study Area *Upper Danube Valley* during winter time.

There will be two types of questions:

?? Questions which are comparable between FORAM Partner Countries, i.e. questions which will be included in the general survey questionnaire.

?? Questions which handle forest landscape issues specific to Germany and specific to Study Area *Upper Danube Valley*.

3.3.2 Development of Public Survey Questionnaire

3.3.2.1 Drafts and Reviews

A number of drafts have been worked out by the Project Coordinators which were discussed and reviewed by each Partner. Following every discussion a new draft version of a German (translated) questionnaire was developed by our team refining the latest versions both of the Coordinators and ourselves (see quest1.doc, quest2.doc, quest3.doc, quest4.doc in Chapter 6: Annex).

3.3.2.2 Final German Questionnaire

The latest version of the German survey questionnaire has still to be refined because of new ideas and findings. Nevertheless we think that the questionnaire has to have a certain structure to make the answering easier and logical.

The preliminary structure is shown in the following table:

<i>Questionnaire Structure</i>	
I.	<i>Accompanying Letter</i>
II.	<i>Questions</i>
	1. Regional questions concerning forest landscape issues in Study Area <i>Upper Danube Valley</i>
	2. Forests in General

3. Forest Visit

?? -Visitor Frequency

?? -Activities During Visit

4. Forest Aesthetics

4.a Personal Visitor Impressions/Opinion

?? -Emotions and Feelings

?? -Improvements Regarding Forests

?? -Silvicultural Management Methods (*Countryspecific*)

?? -Forest Landscape Issues (*Countryspecific*)

* ...

* ...

* ...

* ...

?? -Willingness to Pay

4.b General Questions about Person

The survey will include questions for comparison of preferences between *FORAM Design* Partner Countries as well as questions to investigate issues specific to the 6 individual Partner Countries. In addition a number of external and internal forest images will be integrated which will be to be evaluated by the respondents with respect to overall aesthetic quality.

3.4 Conceptual Design Guidelines - DRAFT -

The work done contributes to Task 5 of the Technical Annex.

Conceptual design guidelines which handle the overall appearance of the landscape were developed for Study Area *Upper Danube Valley*. So far they do not regard forest interiors but aesthetical and amenity issues described in Sub-Task 5.2. Hence the concept focuses primarily apparent landscape changes like afforestations of pasture land and valleys. The study is divided into the following five steps:

- ?? 1. Selection of Visual Landscape Units in the Study Area
- ?? 2. Assessment of local outdoor activities
- ?? 3. Preliminary Landscape Amenity Assessment
- ?? 4. Assessment of local afforestation pressure
- ?? 5. Graphic development of preliminary prototypes for all landscape units

3.4.1 Selection of Visual Landscape Units

The selection of Visual Landscape Units is primarily based on morphological differences in the Study Area. The detailed classification in 8 units reduces the problem of generalization of guidelines and presents a profound basis for a landscape unit based design. All landscape units of the Study Area (the cliff zone in the west is missing and will be added in later versions) are shown in the following map: donau10.jpg „*Map of Visual Landscape Unit*“ .

3.4.2 Assessment of Local Outdoor Activities

Another map (donau40.jpg: “*Concentration of Outdoor Activities*“) is based on data acquisition by observations and visitor census. It indicates which places and areas in the study area are preferably visited. The attractiveness of those preferred places depends on amenities and facilities for day trippers and holiday makers. Scenic places which are additionally good for various outdoor activities are preferred destinations which often show high visitor pressure. Landscape units concerned have to be designed with respect to their present natural attractiveness and to expected future conflicts of competing landuses.

3.4.3 Preliminary Landscape Amenity Assessment

A third map (donau20.jpg: „*Preliminary Landscape Amenity Assessment*“) is an interpretation of the two previous maps. It shows areas with high, medium and improvable amenity, due to scenery, different landscape features like rivers or outstanding rocks, etc., and recreation facilities like bicycle trails, etc. . In this regard the aesthetic component plays a significant role. Hence Amenity Design Guidelines have to

- ?? conserve areas with high amenity
- ?? improve areas with medium amenity and
- ?? develop areas with amenity capable of improvement.

3.4.4 Assessment of Local Afforestation Pressure

The map donau30.jpg („*Assess. of Local Afforestation Pressure*“) shows the amount of afforestations in all community districts in the Study Area during a period of 15 years. The map indicates communities with different increases of afforestations (from less than 5 ha up to more than 100 ha). The numbers refer to afforestations of arable land, which has been planted preferably with fast growing spruce. On the dark green areas there is still a very high afforestation pressure with effects on aesthetics and amenity. Consequently there is a high priority to develop appropriate design guidelines for the landscape units concerned.

3.4.5 Graphic Development of Preliminary Prototypes -DRAFT-

Prototypes of Landscape Units are an adequate mean to develop Amenity Design Guidelines. They correspond to the heterogeneous morphology of previously described Visual Landscape Units. Besides the primary visual aspect the prototypical design approach also manages ecological and economical issues in terms of amenity design. All findings of the first steps have to be taken into consideration for an adequate landscape design.

Amenity Design Guidelines may therefore contain verbal and graphic descriptions of prototypical landscape units, based on the result of the Public Preference Survey and ecological and economical needs.

Following draft shows manually done graphics of prototypes for landscape unit "Danube Valley" and "Plateau Flächenalb", which handle the problem of afforestations and their aesthetic and ecological effect. We intend to complete the study with

- ?? photorealistic prototypes for all landscape units (Photoshop/GIS)
- ?? prototypes for silvicultural systems
- ?? visibility analysis for selected prototypes (GIS)
- ?? reference to the economical and ecological situation (GIS)
- ?? verbal description

Prototype for Landscape Unit "Danube Valley"

- ?? 1. Aesthetic Maintenance of Status Quo
See image (dondrw1a.gif, dondrw1b.gif) files in Annex.
- ?? 2. Design of Forest Mantles for Existing Afforestations
See image (dondrw2a.gif, dondrw2b.gif) files in Annex.
- ?? 3. Reforestation of Present Afforestations
See image (dondrw3a.gif, dondrw3b.gif) files in Annex.

Prototype for Landscape Unit "Plateau (Flächenalb)"

- ?? 1. Afforestations to Structure Agricultural "Deserts"
See image (pladrw1a.gif, pladrw1b.gif) files in Annex.

?? 2. Afforestation of Intensively Used Arable Land

See image (pladrw2a.gif, pladrw2b.gif) files in Annex.

Chapter 4 - Project Research Ahead

4.1 The *Burgen-Project*

Existing Design Guidelines are often composed of general statements and recommendations. Since there is no detailed scale, the realisation in the field is difficult and vague. Proposed software applications are poorly explained and often too complex for planners, which results in using conventional desktop designing means instead. Therefore we are cooperating with a landscape architect in the Study Area *Bavarian Alps* to encounter this problem. We are involved in designing a landscape master plan for the community district *Burgen*. The main objective is to investigate the applicability and opportunity to transform design guidelines with modern planning tools into practical landscape planning. The study is focused on the aspect of afforestations of pasture land and their aesthetical and ecological effect. We intend to run through the entire planning procedure, from the inventory to the final public presentation.

4.2 Public Survey

The following survey strategy will be applied within the framework of the FORAM Design Project:

?? 1. Quantitative Survey:

The *objective* is to identify what the public like or dislike. It was intended to be representative of the national populations of all 6 Partner countries. Because it is not possible to reach a random sample of the overall population in Germany it was decided to concentrate the investigations in a certain region and limit the number of respondents

to the random sample of the local population within Study Area *Upper Danube Valley*.

The quantitative research will include the following methodologies:

a) *Evaluation of forest images*

A number of internal and external forest images common to all Partner Countries as well as images depicting forest landscape issues specific to Germany will be evaluated with respect to overall scenic quality. The images used will be original ones and/or manipulated with *Photoshop*.

b) *Written questionnaire*

A limited number of questions which are relevant to all Partner countries as well as questions which are specific to Germany.

?? 2. Qualitative Research Studies:

The *objective* is to identify why the public like or dislike certain forest landscape elements. Thereby preferences which are specific to individual Partner countries shall be investigated.

The surveying will be carried out in Study Area *Upper Danube Valley* during winter time. We have decided not to send the survey questionnaires to a limited number of the national population only but to combine the written questionnaire survey with interviewing people

who are taking part in local meetings or conferences, at schools or simply ask them at the door of private houses.

4.3 Forest Design Guidelines

Based on findings of the Public Preference Survey we want to develop guidelines to establish adequate silvicultural systems. This part of the Design Guidelines refer to the design of the Forest Interior. The second part refers to the overall appearance of forests in the landscape. To research the second part we are going to complete prototypical Design Guidelines for landscape units of the Upper Danube Valley by means of computer simulations as described above.

Chapter 5 - Dissemination

Results of our studies have been disseminated on following occasions:

?? At an International Meeting of the IUFRO subject group 6.01 (Leader Dr. Tuija Sievaenen, Finland) in August 1996

Results of research in both Study Areas *Spitzingsee* and *Upper Danube Valley* have been presented multi medial with ArcView and a Digital Light Projector at the Faculty for Forestry in Freising.

?? At the International Symposium for "Application of Remote Sensing in Forestry" in Zvolen, Slovakia.

A poster (poster.doc) with computer simulations and landscape models of Spitzingsee and Upper Danube Valley has been presented.

?? On the FORAM home page on the Internet

?? In a publication in the "Forstwissenschaftliches Centralblatt" #115, pages 213-222

?? At the FORAM Design Project Meeting in Madrid / Spain (madrid.doc)

Chapter 6 - Annex

Filelist of all files in the report96 directory on the FORAM ftp server

To download, read and/or save on your harddisc use your ftp- or WWW- Browser and type:

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File name Content

HTML 3.0 files (*.htm)

read1st.htm	FORAM Online Introduction
report96.htm	Frontpage and Table of Contents of report 1996
alspsrvey.htm	The Spitzingsee Public Survey
compwork.htm	Computer Landscape Modelling
mailform.htm	Mailing Form for immediate online mails
concept.htm	Conceptual Design Guidelines
prototyp.htm	Graphic Development of Prototypes
dissemin.htm	Dissemination of work
ahead.htm	Research Ahead
introduc.htm	Introduction of Report 96
summary.htm	Summary od Report96

Image files (*.jpg, *.gif)

map01.jpg	Digital Elev. Modell Spitzingsee (mesh along x)
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map15txt.jpg	Matrix for SBE Values (map15.jpg)

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chart1.jpg	Forest type preferency of Spitzingsee visitors
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chart3.jpg	Information and landscape perception
chart4.jpg	Willingness to pay of female Spitzingsee visitors
chart5.jpg	Willingness to pay of male Spitzingsee visitors
panox.jpg	Original panorama photo of Spitzingsee area
panoy.jpg	Manipulated panorama photo of Spitzingsee area
skix.jpg	Original view from Taubenstein peak
skiy.jpg	Manipulated view from Taubenstein peak
origin5.jpg	Original view to parking area from gondula
versio5a.jpg	Manipulated view to parking area from gondula
origin8.jpg	Original view over lake to the gondula station
versio8a.jpg	Manipulated view over lake to the gondula station
verbau.jpg	Image of iron avalanche protection construction
donau1.jpg	Map of Visual Landscape Unit ca. 8x5 cm
donau10.jpg	Map of Visual Landscape Unit ca. 15x10 cm
donau2.jpg	Map Prelimin. Landsc. Amenity Assess. 8x5 cm
donau20.jpg	Map Prelimin. Landsc. Amenity Assess. 15x10 cm
donau3.jpg	Map Assess. of Local Afforest. Pressure 8x5 cm
donau30.jpg	Map Assess. of Local Afforest. Pressure 15x10 cm
donau4.jpg	Map Concentration of Outdoor Activities 8x5 cm
donau40.jpg	Map Concentration of Outdoor Activities 15x10 cm
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dondrw1b.gif	Manually drawn prototypes of Danue Valley
dondrw2a.gif	Manually drawn prototypes of Danue Valley
dondrw2b.gif	Manually drawn prototypes of Danue Valley
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filelist.txt	This file
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passpt.txt	List of used reference points of Spitzingsee area
sbeaml.txt	ArcInfo Makro File for SBE assessment
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bwintxt.doc	Stand parameters for bwindemo.jpg graphic
report96.doc	The entire Report96
quest1.doc	Questionnaire in German language, version 1, Aug/Sep. 96
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quest4.doc	Questionnaire in German language, version 4, Nov. 96

Excel 5.0 Files (*.xls)

bedeutg.xls	Excel 5.0 chart of public forest significance (in German language)
inform.xls	Excel 5.0 chart of Information effects aesthetics
forsttyp.xls	Excel 5.0 chart on preferred forest types
financex.xls	Excel 5.0 chart Willingness to pay - female
financey.xls	Excel 5.0 chart Willingness to pay - male
signific.xls	Excel 5.0 chart Significance of Alpine Forests for Recreation
sbematrix.xls	Scenic Beauty Estimation Matrix for Spitzingsee Model

Sub Annex DE-1

Chapter "Introduction"

FORAM-Design Report96 Online

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filelist.txt Filelist of all report96 files on the ftp-server

Sub Annex DE-2

Chapter "The Spitzing See Public Survey"

Public Survey at Study Area III Bavarian Alps

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signific.xls	Excel 5.0 chart Significance of Alpine Forests for Recreation

Sub Annex DE-3

Chapter "Landscape Modelling"

Computer Landscape Modelling

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 viewdz.doc from report95, review of View Distance Zones

Excel 5.0 Files (*.xls)

sbematrix.xls Scenic Beauty Estimation Matrix for Spitzingsee Model

Sub Annex DE-4

Chapter "Public Preferency Survey"

Public Preferency Survey

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quest4.doc	Questionnaire in German language, version 4, Nov. 96

Sub Annex DE-5

Chapter "Conceptual Design Guidelines"

Conceptual Design Guidelines

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Sub Annex DE-6

Chapter "Dissemination"

Dissemination of Research

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