FOREST STEWARDSHIP

FOREST INVESTMENT ACCOUNT

Integrated Visual Design Procedures and Standards

Revised April 10, 2008

BRITISH COLUMBIA

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Forest Investment Account funding recipients interested in undertaking Integrated Visual Design projects are required under their contract with Price Waterhouse Coopers to adhere to the standards established by government. The procedures and standards for developing an Integrated Visual Design plan are documented below. In the event a recipient desires to vary from the standards, written authorization must be obtained from the ministry contact noted in the activity table.

1.0 Introduction

The intent of an Integrated Visual Design Plan is to provide long-term direction for the development of the timber resources for an area of 5,000 hectares or less in a manner consistent with higher-level planning direction and respectful of other resource values. Integrated Visual Design (IVD) employs a process that considers all resource values simultaneously in an integrated fashion. It is applied in both the plan and perspective view so as to address visual quality concerns while optimising harvest opportunities in visually sensitive areas.

Integrated visual design projects are generally applied to landscapes that have been identified as having important scenic values and where there is also a need for some level of timber flow to occur. IVD strives to balance the use of competing resources now and in the future and achieve an acceptable visual result.

IVD standards are evolving and will be updated as more projects are completed. Until that time these standards represent the state of the art and most efficient approach to date. All design work must be in accordance with these Forest Investment Account Standards, including any standards or specifications stated in the Visual Landscape Design Training Manual (VLD Manual).

2.0 Minimum Content

An Integrated Visual Design plan must:

1. Define the visual design unit.
2. Establish management objectives to be achieved.
3. Assemble all available resource inventory information.
4. Conduct a resource analysis, which must include visual force and land feature analyses.
5. Develop a concept design
6. Produce a detailed design
7. Test the design through visual simulations

3.0 Defining the Visual Design Unit

It is extremely difficult to design large areas with the IVD process as landforms can become too complex and there will be too many factors to consider. IVD is best applied to a discreet perspective view unit where visual resources are the principle issue. This may be the backdrop to a Tourism Lodge or community or could be the hillside above a popular fishing lake. In most cases the visual design unit will be defined by heights of land, shorelines and ridgeline boundaries. A critical step in the Visual Design Unit (VDU) delineation task is the selection of the project viewpoints. Project viewpoints should be representative of the means of travel or use of the average resident, forest visitor or traveler in the area (e.g., vehicle on roads, boat on water, or on foot), and account for settlements, special features, road stops, viewpoints, traffic pull-offs, and traffic conditions. It should be noted that the viewpoints selected may or may not correspond to those shown on the Visual Landscape Inventory mapping.

Photographic panoramas of the VDU should be taken from each of the project viewpoints. The photographs should be taken on clear days with the sun behind or perpendicular to the viewer, and should use a 50 or 55mm focal length to ensure the proportions of the landscape depicted are similar to those as seen in the field. Illumination is strongest in the summer months. East-facing units are best viewed in the morning, and west-facing units are best viewed in the afternoon. The photography will provide a means for evaluating the accuracy / quality of visibility plots, and the visual simulations prepared in subsequent phases of the IVD process, It also provides a base for conducting the visual force and land feature analyses,

Once the project viewpoints have been selected the VDU can be defined by generating a composite visibility plot from these locations using GIS.

The recommended scale for carrying out design mapping activities is 1:10,000. The map scale should allow cutblocks to be designed at a scale that would allow proposed cutblock boundaries to be resolved.

> *It should be noted that design units might not coincide with visual landscape inventory units, licensee chart boundaries, or district boundaries. Licensees may wish to work together on the design to resolve tenure issues and long term cutblock location and timing.*

4.0 Setting Resource Objectives

Objectives set the targets for the outcome of the design. The design objectives are to be derived in part through:

- Consultation with the District Manager.
- Reference to the specific resource management goals and objectives presented in strategic plans, such as LRMP's and Landscape Unit Plans.
- Reference to the Objectives Matrix for the management area
- Reference to the relevant legislation and policy governing activities in the design area.

It is mandatory that the following resource values be addressed:

- Visual Quality Objective (R, PR, M)
- Timber Flow (Annual AAC)
- Recreation/Tourism (Experience, ROS)
- Water Quality (Riparian areas, Community watersheds)
- Landscape level biodiversity / Ecological Functioning (NDT Type and landscape disturbance patterns)
- Stand level biodiversity (e.g. Wildlife Tree Patches)
- Fish / Wildlife Resources (Riparian areas, Species at risk, ungulate winter range, etc.)
- Cultural heritage (Archaeological and / or other heritage resources)
- Soils and Terrain Hazard (Class IV and V)
- Forest Health (i.e. MPB, Phellinus etc).

5.0 Resources Inventory

A comprehensive resource inventory of biotic, abiotic, cultural, ecological information and regulatory requirements must be compiled to gain an understanding for the full range of factors influencing the design area. This information, should be collected in both digital and hardcopy format, where possible. Converting hardcopy information into a digital format will enable GIS analyses. As a minimum the following available inventory/guideline information is to be assembled for analysis:

- TRIM Contour Mapping
- Vegetation Resources Inventory (to identify operable, inoperable forest types)
- Visual Landscape Inventory (Viewpoints, Visual Quality Objectives)
- Recreation Features Inventory (Class 0 & 1 features)
- Recreation Opportunity Spectrum (Experience / Setting)
- Riparian/Wetland Guidelines
- Identified Wildlife Winter Range.
- Terrain Hazard Mapping (Class IV and V)
- Forest Health

In those cases where regulations or guidelines are prescriptive but not mapped e.g. riparian zones this information will have to generated through a GIS analysis using existing data and / or mapped on hardcopy and digitized for analysis purposes.

6.0 Resource Analysis – Re-Assembling and Interpreting the Landscape

This step is concerned with understanding the resource inventory information in a manner that reveals its influence on use and development. Using GIS, combine and analyse the resource information collected so as to identify the key landscape patterns, processes and functions that will influence design development. The outputs of this phase are:

1. Operability assessment
2. Visual Force Analysis
3. Land Feature Analysis
4. Opportunities and constraints analysis.

All analyses must be carried out in plan and perspective view.

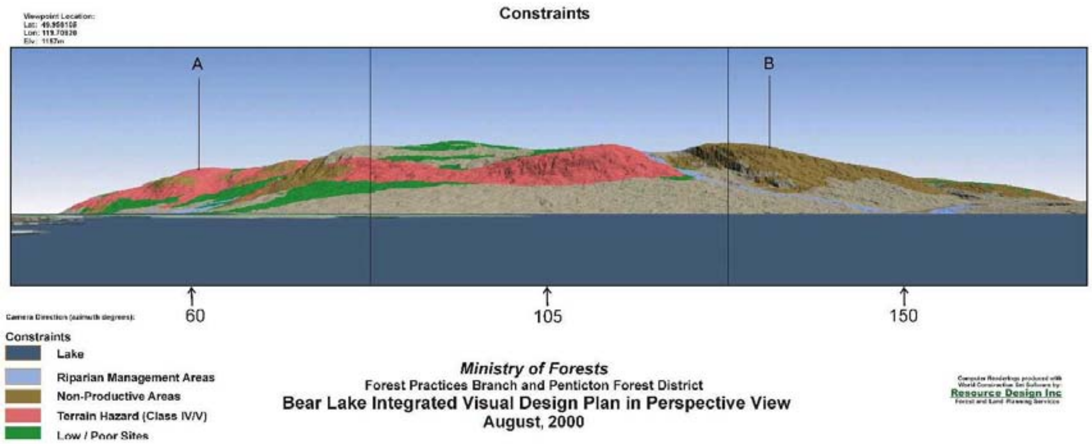
6.1 Operability Assessment

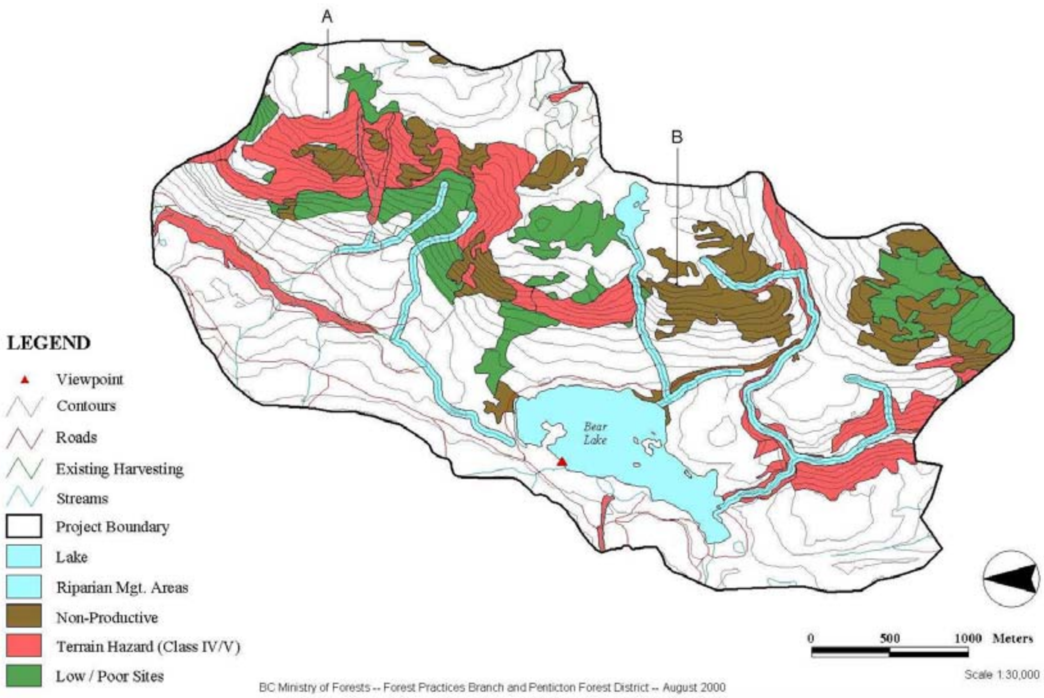
An *Operability Assessment* identifies where you can harvest, where you might harvest and where you cannot harvest (i.e. what areas can be planed for and what areas are out of bounds).Overlay terrain hazard class 4 & 5 areas, inoperable stands, riparian and wetland management areas and other relevant information to identify those areas that would be precluded from development for physical, environmental or regulatory reasons.

Use the following assumptions to create the operability coverage. Any lands inclusive of the following characteristics would be deemed inoperable for planning purposes.

- Terrain Hazard Class IV & V
- Environmentally Sensitive Areas (Soils, Erosion or Regeneration issues)
- Non-Productive Forest Types (Brush, Rock, Deciduous)
- Low to Poor Sites in Combination with ESA_1

- Riparian Management Areas, Riparian Reserve Zones & Lakeshore Reserve Zones





The map produced will represent the sum of all regulatory, functional, ecological and biophysical constraints influencing the site, and will define the broad patterns of operability. Areas outside of lands described by these criteria (white areas on map) are considered operable for design purposes.

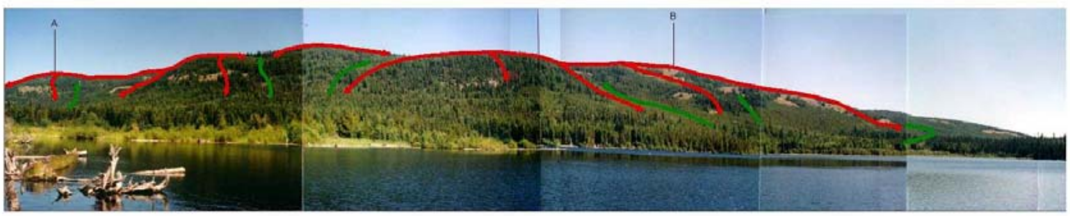
Employing Visual Nature Studio, World Construction Set or other landscape simulation software, generate 3D perspective views of the composite constraints from your design viewpoints.

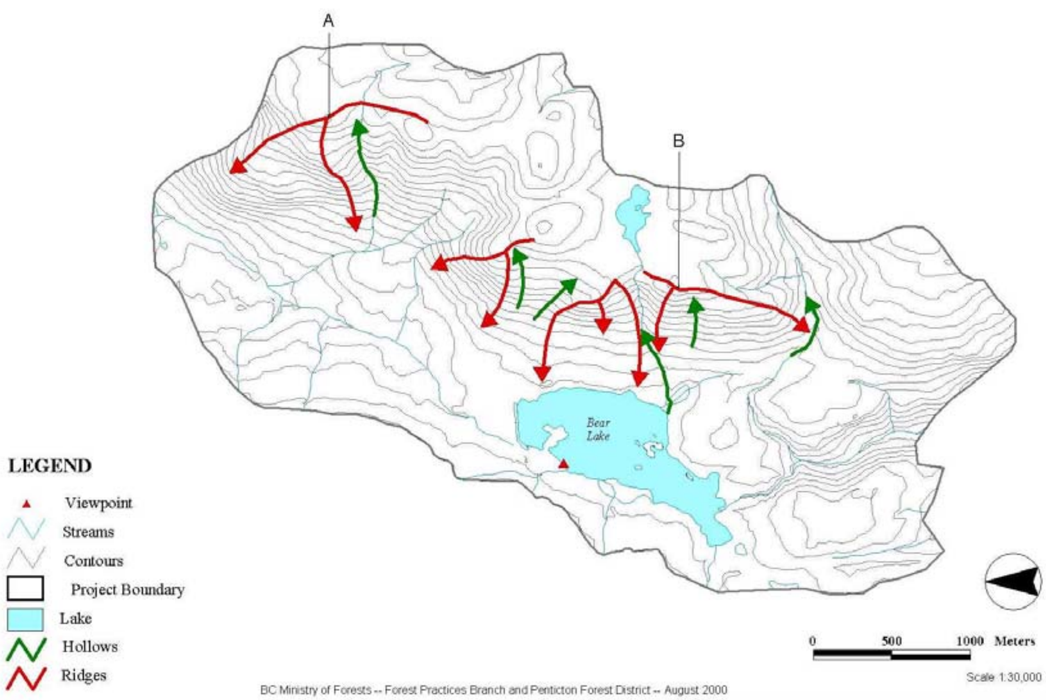
This will provide an understanding for the broad patterns created in the landscape and will serve to guide the design of harvest units once other analyses are completed.

6.2 Visual Force Analysis

The visual force concept is based on the premise that, as we observe the landscape, our eyes are drawn up hollows and down ridgelines. Mapping this concept is critical to developing cutblock designs that better fit the natural landscape. The lines of visual force are mapped in both plan and perspective view using different colours and weights of arrows: red arrows are drawn down ridges and green arrows up hollows.

When cut blocks are being designed, their boundaries should respond to the visual force analysis mapping (in both plan and perspective view), by pushing up in gullies (green arrows) and dropping down on ridge lines (red arrows). The weight of the arrow will dictate the amount of response; the thicker the arrow, the stronger the response; the thinner the arrow, the weaker the response. (See page 49 of the VLD Training Manual)



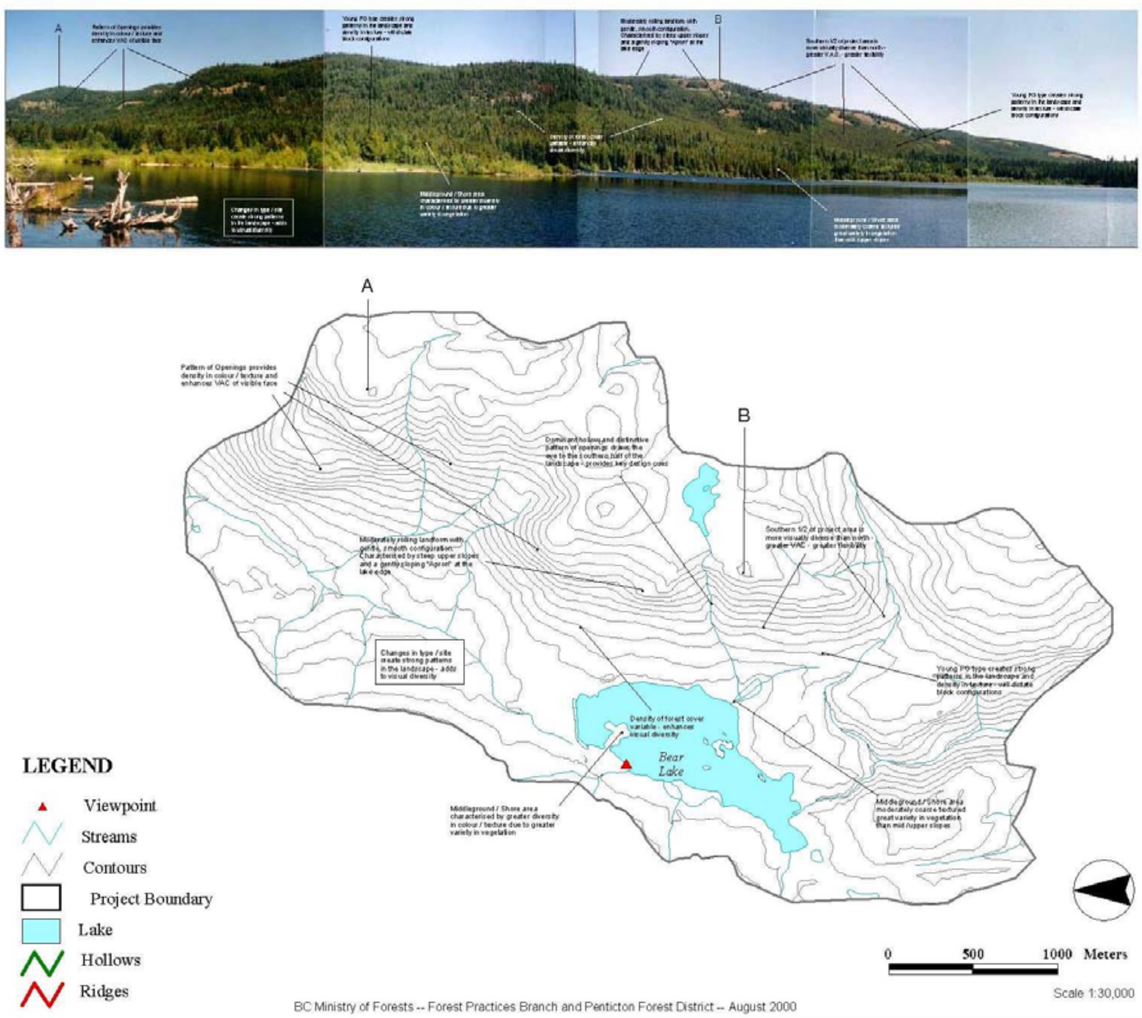


6.3 Land Feature Analysis

This analysis builds on the visual landscape inventory, identifying the various features in the landscape defining its visual character and diversity. Its primary aim is to identify broad patterns in the occurrence and distribution of individual landscape features, such as rock outcrops, vegetation and water features that may influence the landscape design.

There is generally some underlying logic as to why some features occur where they do, rock outcrops are related to geology, erosion, and landform; vegetation to drainage, soil, and exposure; and water features to landform structures and geology. Historic events, such as wildfires, insect attacks, or blow down, may have left their mark; and landscape alterations from human activities may be present. By documenting the size, shape, and distribution of these the designer is provided with some insight about what size, shape, and distribution of cut blocks might work best on the landscape. Describing the type of landforms present can suggest which shapes are most appropriate for a landscape (e.g., sharp, rugged peaks may indicate that sharper, more rugged shapes would best fit the landscape).

These patterns should be mapped in both plan and perspective view using annotations and symbols to document them. It should be noted that much of the detail to be analysed can only be seen on the photography and will not be recorded on inventory mapping. Refer to page 52 of the VLD Training Manual for further direction.



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spatially. This provides the basis for a design programme. Once issues are identified, specific design objectives for each issue can be devised thence strategies for realising the objectives (i.e.

silvicultural systems, harvest systems, access, etc). This in essence forms a "concept" or series of considerations that can aid in the detailed design of harvest areas.

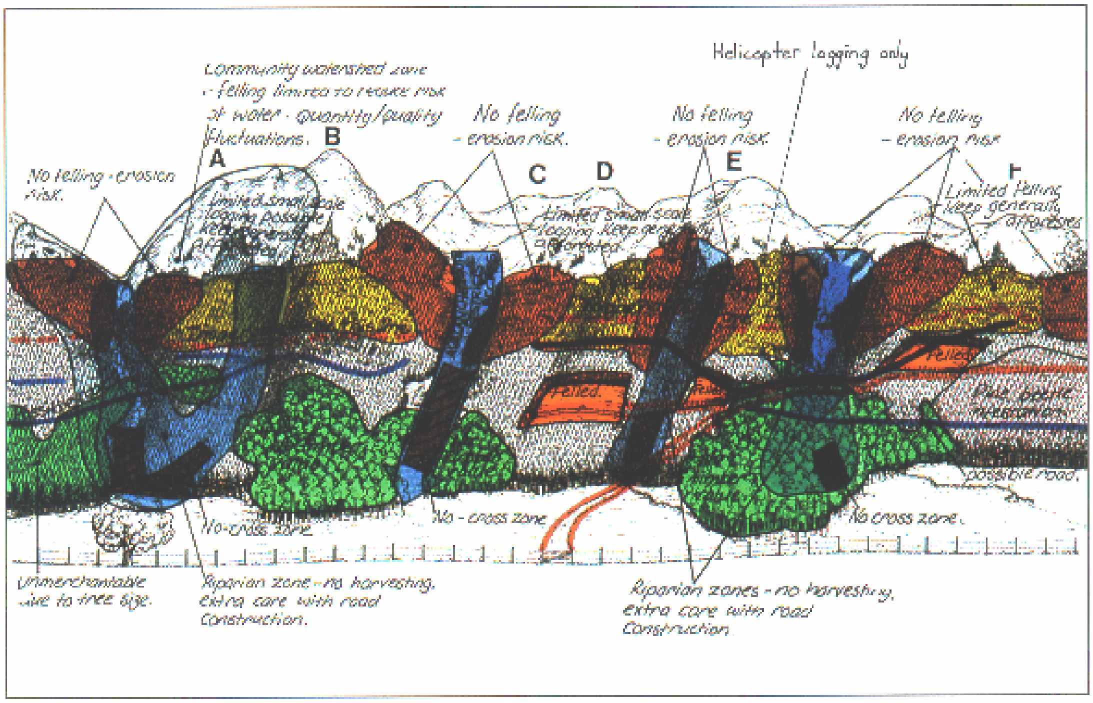
To carry out an opportunities and constraints analysis summarise in tabular form how each resource (visuals, forest cover, terrain, access, silviculture, wildlife etc) may influence the use and development of the landscape.

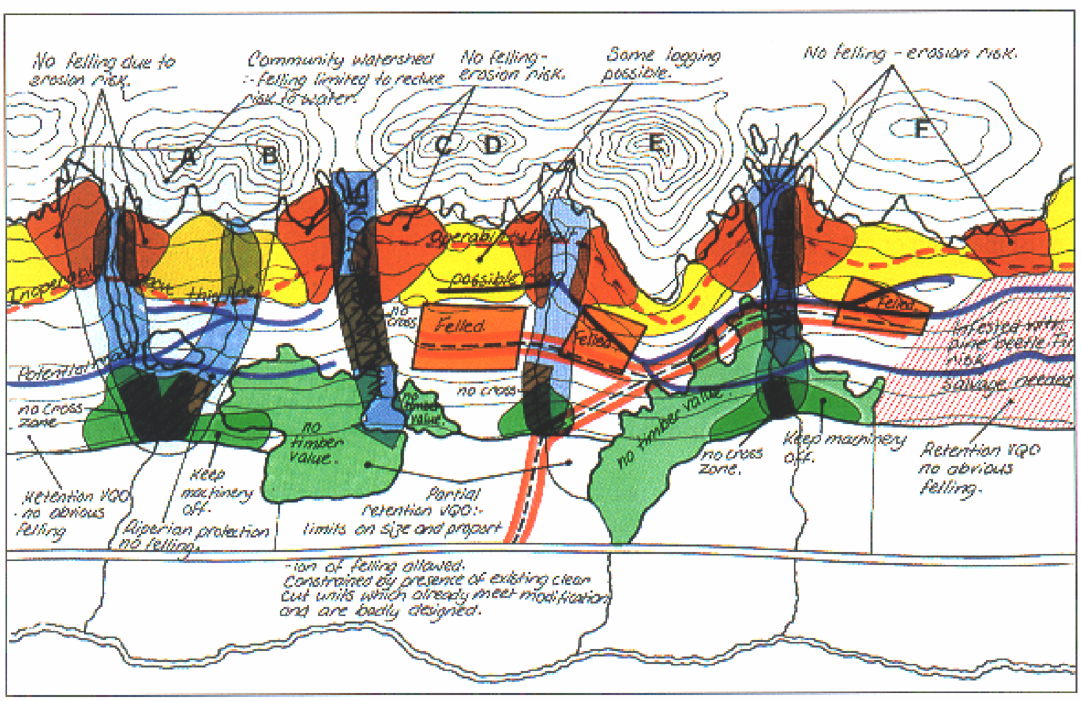
Examples

Resource	Opportunities for Development	Limitations to Development
Visual	The extensive natural openings and exposed rock faces situated in the steeper areas of the unit create pockets of visual diversity. These offer opportunities for more intensive harvesting provided the shape, position and size of the openings echo landscape character.	Prominent position (focal) of Design Unit relative to Park Campground makes this unit very sensitive visually to any change.
Timber and Engineering	**Forest Cover** Extensive areas of mixed timber types / age classes provide opportunities for selective harvest of mature Fir in first pass. **Harvest Methods** For southern portions of the unit, short flying distances and presence of suitable landing area may allow heli-logging operations.	**Visual Landscape** High Sensitivity as a result of steep slopes, a near mid-ground position in the landscape and a VQO of Retention limits extent of removal possible during any given pass. **Access** Ground access to mech. timber is limited by steep, inaccessible terrain. Harvesting must rely on aerial or long-line harvest systems. **Windthrow** Shallow rooting medium may result in a Moderate to high windthrow hazard limiting the potential for use of partial cutting silvicultural systems. **Soils** Extensive areas of Class V / IV terrain (Moderate to high potential for soil damage and surface erosion) require precautions in terms of season, duration of method of harvest. **Stand Composition / Age Class** Extensive areas of Pl found in the southern half of the unit will limit the use of partial cutting systems.

Once completed, this assessment permits key resource design issues to be identified. In response, design objectives (e.g. stand structure, degree of landscape alteration) specific to each issue can be identified and design strategies and principles for achieving the objectives devised (e.g. silvicultural or harvest systems, timing of harvest etc. Collectively, the results from the analysis begin to suggest a design programme; identifying a range of possible physical design responses and suggesting how and where these might occur.

While not mandatory, presenting the opportunities and constraints analysis graphically can provide the designer with a better sense of how the landscape will develop.





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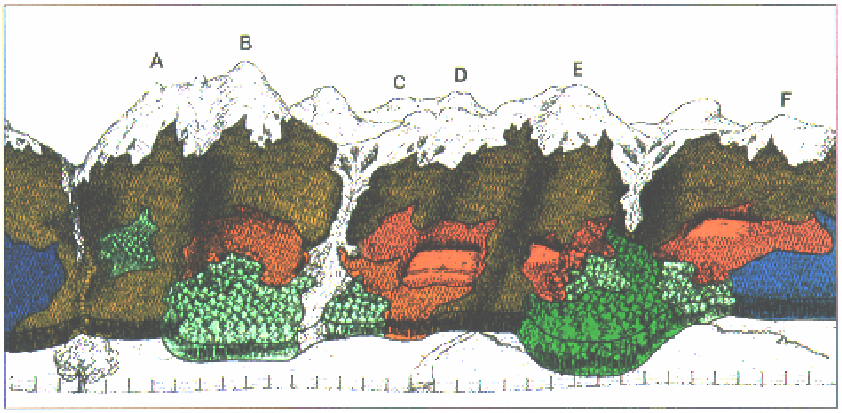
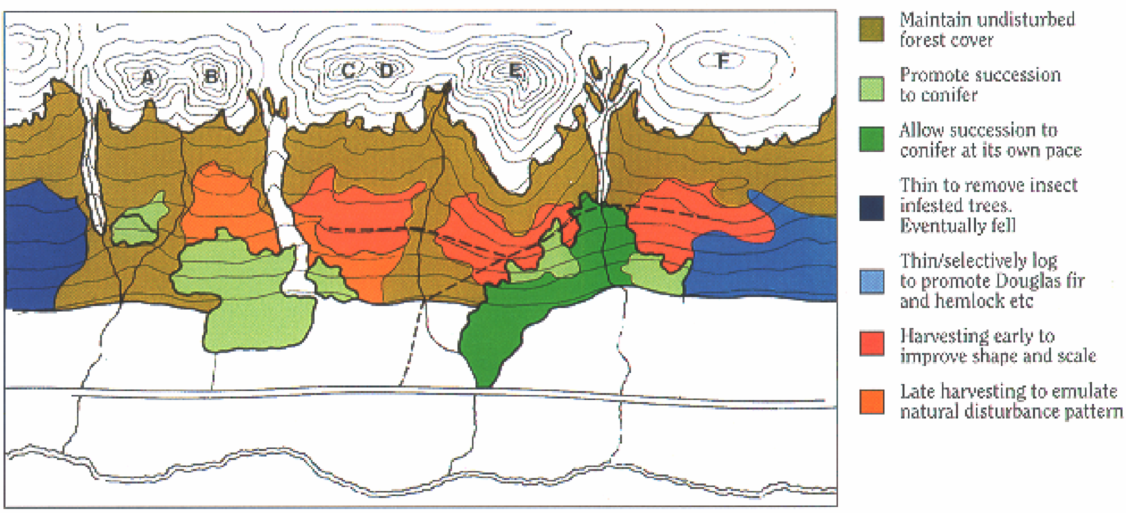
landscape might develop over time. These ideas are expressed using rough annotated sketches in both plan and perspective views; illustrating areas to protect, areas where harvesting is possible, and initial ideas about the location, size and shape of individual harvest units. Potential harvest units can be sketched in over the photographs / perspective views of the operability analysis and assessed as to how well they relate to the findings of the analysis. Eventually this will lead to one or number of conceptual options that can serve to guide the detailed design phase (Section 8.0 following).



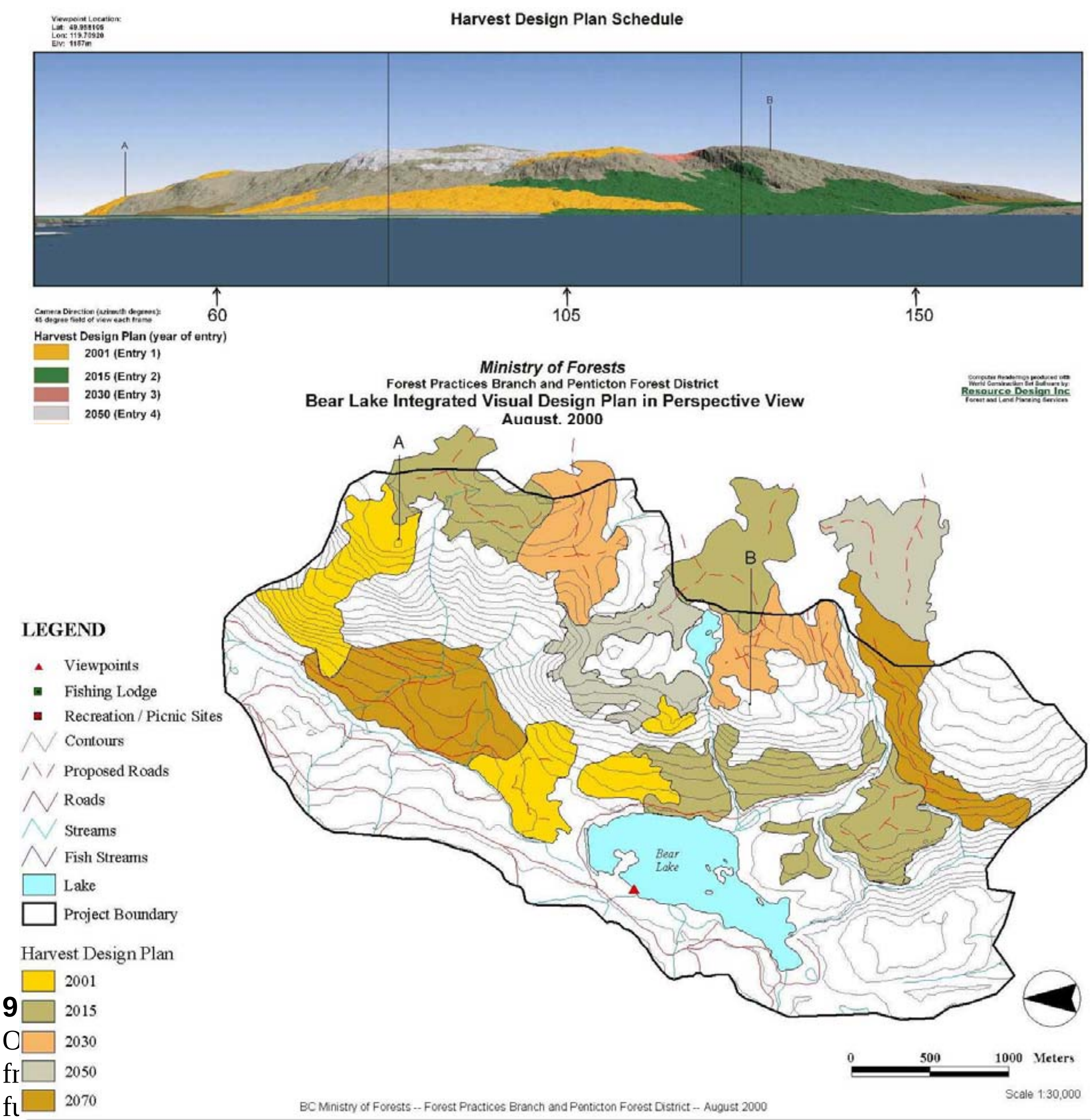


8.0 Detailed Design (Complete pattern of Shapes)

The objective of this phase is to design a complete pattern of harvest units that are well integrated with their landscape setting (visual and ecological) and which satisfy the land use planning direction and legislation governing the area. Using the loose ideas and rough sketches prepared during the design concept phase as a starting point, and the opportunities and constraints analysis for guidance, begin to refine the concept by subdividing operable areas into individual harvest units. Use the visual force and land feature analyses to help shape the units and the land feature analysis to guide their size and distribution. After several iterations the shape, extent and location of individual harvest units will begin to evolve from the landscape, each responding to the underlying landform, patterns in vegetation and age class and functional considerations such as road locations, landing areas and optimum yarding or skidding distances.

Ultimately a complete pattern of harvest units will emerge depicting all possible harvest opportunities over the period of one rotation, specifying the harvest and silvicultural system for each. On the basis of adjacency, visual and age class considerations, the timing of each harvest pass is to be scheduled.

Employing GIS and visual simulation software the detailed design plan is draped on a 3-D model and simulated as viewed from key design viewpoints. To assess how well each block / pass responds to the underlying landscape structure a visual force analysis of the detailed design plan is conducted both on the topographic base (plan view) and in perspective view as seen from the design viewpoints.



Three variables are used to evaluate the visual component. These are:

1. Basic VQO definition: Does the proposal meet the VQO definition?

2. Design: Does the design respond to the underlying landscape structure and exhibit elements of good visual design?
3. Scale: What is the percent perspective alteration of the landform resulting from proposed harvest for each pass?

Section 1.1 of the Forest Planning Practice Regulation provides the formal definition for each VQO category that must be achieved.

The visual design is evaluated on the basis of the following considerations:

1. **Does the alteration respond to the major lines of visual force?** Opening boundaries should respond to topography by pushing up in hollows and dropping down on ridges.

2. **Does the alteration borrow from the natural character of the landscape?** Does the shape of the alteration reflect the quality of shapes found in the natural landscape (rounded curvilinear shapes on rounded landforms; spikey more jagged shapes in more rugged terrain) and does the opening respond to natural vegetation patterns and openings in both in scale and shape?

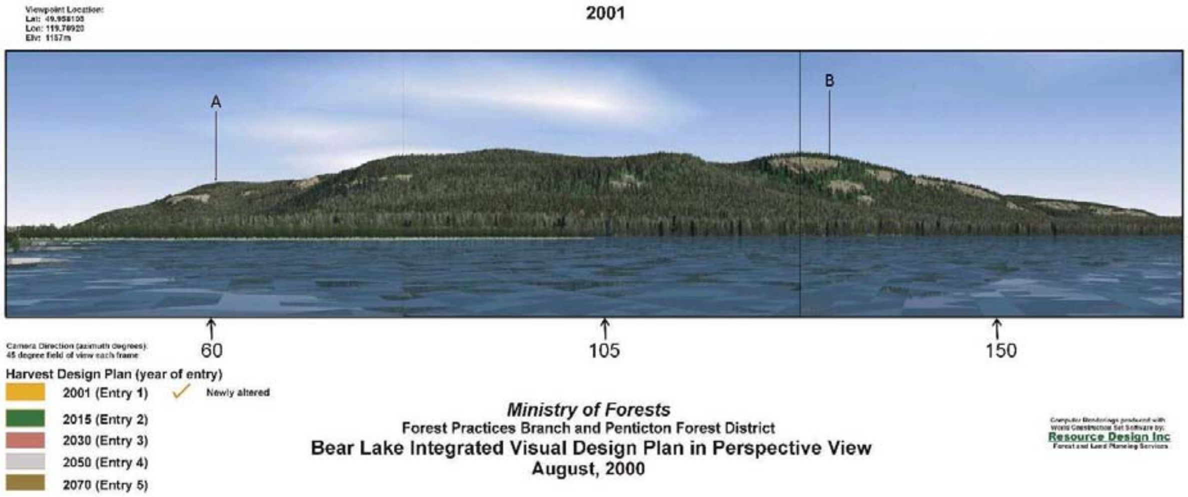
3. **Have edge treatments been incorporated?** Edge treatments include two aspects – feathering to soften the transition between the alteration and the unaltered forest, and the use of irregular or wavy boundaries.

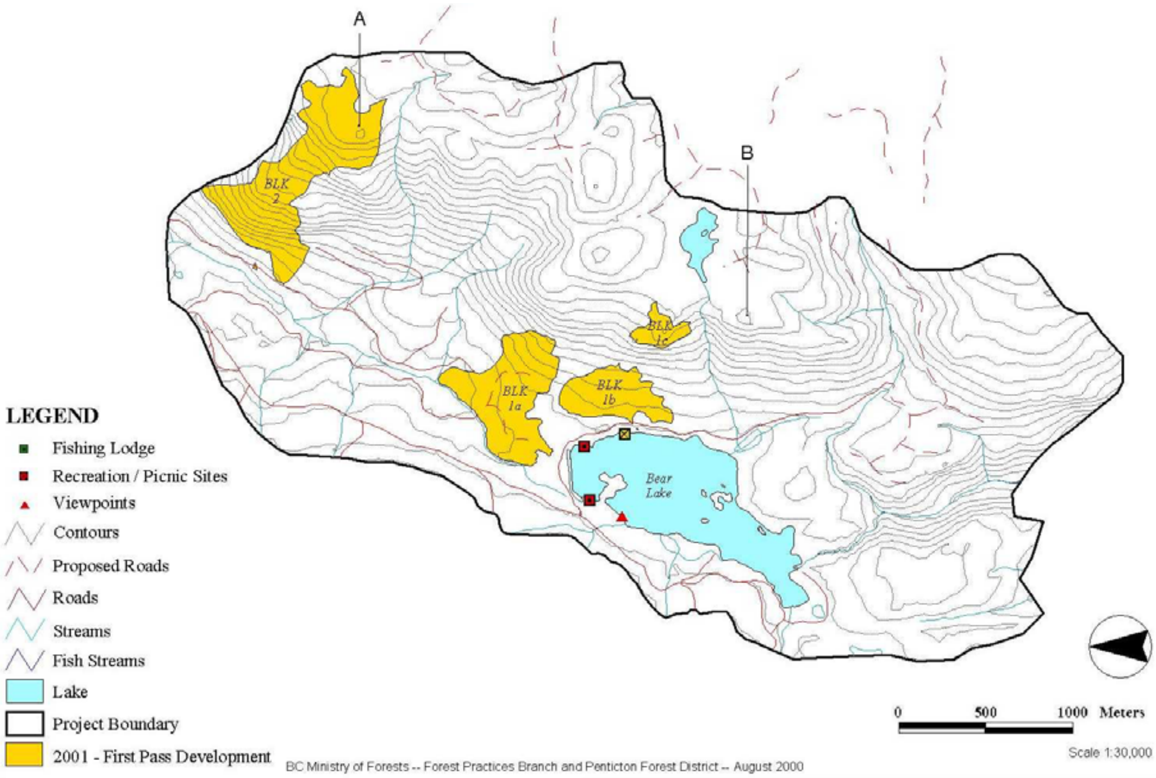
4. **What position does the alteration occupy on the landform?** Openings located lower down and to one side of a landform are generally less obtrusive visually.

To facilitate design evaluation it is critical that a visual force analysis be completed for each pass. As well, annotations (where appropriate) should be included on the design simulations to indicate how the visual design responds to patterns in landscape features and overall character.

Anticipated timber outputs expected from the plan for each pass are to be documented as well.

Where the design does not achieve the visual or other resource objectives, revisions to the initial design plan are required.





10. Final design / documentation

Once all revisions have been made the final Integrated Visual design package (summary report, mapping and simulations) should be compiled and submitted for review and comment. Any factors influencing the accuracy of the design plan (i.e. accuracy of the terrain or other digital data, limited field reconnaissance etc.) should be identified and noted in the report.