

Visual Resource Inventory and Imnaha Valley Study: Hells Canyon National Recreation Area¹

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Abstract: Hells Canyon National Recreation Area was established by an Act of Congress in December 1975. At that time, the U.S. Forest Service, which administers most of the land included, was given the responsibility of developing a Comprehensive Management Plan for the NRA within five years. In order to minimize future visual degradation, the Forest Service planning team for the NRA decided that the USFS Visual Management System should be applied to the entire area. The purpose of this system is to define Visual Quality Objectives for the land examined and also to determine the relative difficulty of meeting these objectives.

In September 1977 the consultant was selected to implement the Visual Management System for the 662,000-acre NRA and also to conduct a detailed river corridor analysis of the 70-mile long Imnaha River Valley in order to determine land development guidelines. The Imnaha River Valley is an integral part of the NRA, but is not typical in that it contains significant amounts of private land used for ranches and residences.

INTRODUCTION

Hells Canyon National Recreation Area was established by an Act of Congress in December 1975. At that time, the U.S. Forest Service, which administers most of the land included, was given the responsibility of developing a Comprehensive Management Plan for the NRA within five years.

Many of the management activities that are necessary for the establishment and operation of the NRA may disturb the natural landscape values that are its basic resource. These activities may include timber harvesting and grazing as well as the construction of roads, trails, campgrounds, overlooks, visitor centers, etc. In order to minimize future visual intrusion, the Forest Service Planning Team for the NRA decided that the USFS Visual Management System is to define Visual Quality Objectives (based on inherent scenic quality and viewer sensitivity to this), for the land examined and also to determine the relative difficulty of meeting these objectives.

Hells Canyon NRA is located on either side of the Snake River in the northeast corner of Oregon and west central Idaho. It includes 662,000 acres (over 1,000 square miles) and is of irregular shape, measuring 75 miles north-south and 35 miles east-west. Figure 1 shows

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its location relative to the States of Oregon, Idaho and Washington.

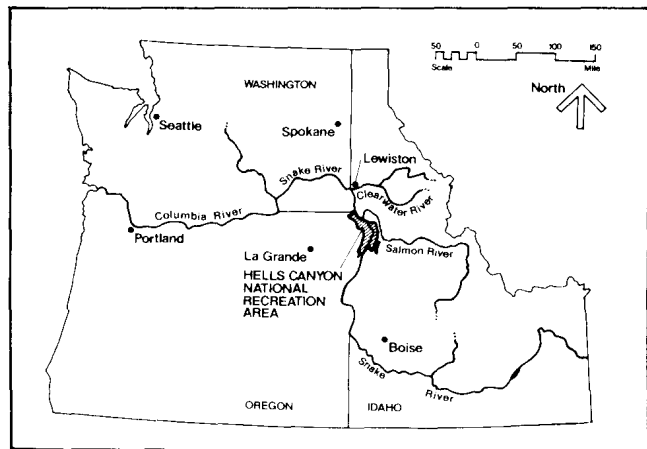


Figure 1. Location Map

The NRA consists principally of land from three National Forests; the Wallowa-Whitman, in Oregon and the Nezperce and Payette in Idaho, each Forest being part of a different Forest Service Region. Within the NRA there are two designated wilderness areas and three wilderness study areas. The Snake, as it flows through the NRA, is a designated Federal Wild and Scenic River. The Rapid River on the eastern edge of the NRA is a Wild River.

The topography of the area is extremely varied and includes the steep, rugged 5000-foot deep canyon of the Snake River (Hells Canyon), the Alpine terrain of the Seven-Devils Mountains (rising to 9000 feet), the high plateau land west of the Snake and many narrow scenic valleys including those of the Imnaha and Rapid Rivers.

VISUAL MANAGEMENT SYSTEM^{4/}

The Visual Management System consists of five basic steps and is applied to the entire National Recreation Area, including the Imnaha Valley. The five steps are outlined below and illustrated on Figure 2: Overall Methodology Diagram. The Imnaha Valley Study is a sixth step in the process.

STEP 1. LANDSCAPE VARIETY CLASS

Three classes of landscape variety (which is equated with scenic quality) are defined. Geographic units (landscape character types), are described and used as a frame of reference

^{4/}As developed by the U.S. Forest Service prior to the Hells Canyon Study.

to judge variety. Using aerial and site photography and topographic maps, landscape variety classes are delineated.

STEP 2. SENSITIVITY LEVEL

Three sensitivity levels (measures of people's concern for scenic quality) are defined. The use features of the NRA are classified as of primary or secondary importance. The types of user of each feature are identified and assumptions made as to their degree of concern for scenic quality. Feature importance and user concern are combined and sensitivity level of use features delineated. Viewpoints at these use features are chosen and the areas seen from them delineated, taking distance from the viewer into consideration.

STEP 3. VISUAL QUALITY OBJECTIVES

The previous two sets of values are combined and each resulting combination delineated and given a Visual Quality Objective; one of four ranging from "Retention" to "Maximum Modification." Designated wilderness areas receive a special VQO of "Preservation."

STEP 4. VISUAL ABSORPTION CAPABILITY

In this step the relative ability of the land to absorb visual change is assessed as a measure of the difficulty of achieving the previously defined VQO. The VAC of four environmental factors is analyzed. These are: slope, vegetation type, soil type and soil/vegetation color contrast. The various conditions found within each factor are assessed and classified into high, medium or low Visual Absorption Capability. These are delineated separately and then combined to show composite VAC values.

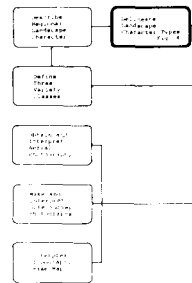
STEP 5. VQO & VAC: COMPOSITE VALUES (VISUAL MANAGEMENT CLASSES)

The VQO values (the product of Step 3, and the Composite VAC values (from Step 4) are here combined and delineated. These final composite values are supplementary to the VQO and VAC values. All three will be used as tools in the development of a management plan for the NRA.

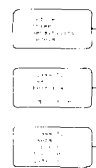
STEP 6. IMNAHA VALLEY STUDY

The three sets of values (VQO, VAC and Composite VQO/VAC) derived in the above steps apply to the entire NRA including the Imnaha Valley. In the Valley, however, because it is relatively highly developed, two additional

1. Visual Resource Inventory: Variety Classes



2. Visual Resource Inventory: Sensitivity Levels



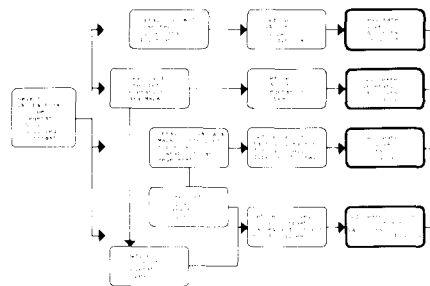
3. Visual Resource Inventory: Visual Quality Objectives



5. Visual Resource Inventory: Composite of VQOs and Total VAC Values



4. Visual Resource Inventory: Visual Absorption Capability



6. Innaha Valley Study

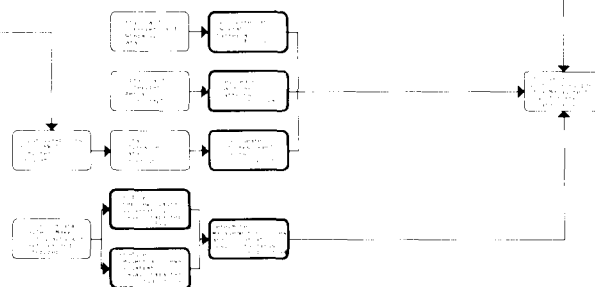


Figure 2

OVERALL METHODOLOGY

Hells Canyon National Recreation Area
Visual Resource Inventory and Innaha Valley Study

U.S. Department of Agriculture, Forest Service
EDAW inc.

factors are examined and delineated. These are land ownership and land use. Moreover, because the Valley will be experienced in a linear fashion by users of the NRA, and because specific developments may affect scenic quality, the frequency of visibility from the valley road is assessed and delineated.

The visual character of the Valley is illustrated in a series of sequential views and a summary plan diagram. Finally, suggestions and recommendations for planning and design standards that might be applied to new and existing development are presented in graphic form.

VARIETY CLASS

The inherent scenic quality or value of the land making up the NRA is, for planning purposes, equated with landscape variety or diversity. Three variety classes are defined, into one of which any area of land can be fitted. The classes are:

- o Class A - Distinctive
- o Class B - Common
- o Class C - Minimal

Landscape character types are used as a frame of reference to classify the physical features of a given area as to their degree of variety.

Class A - Distinctive, refers to those areas where landforms, rockforms, vegetative patterns or water features are of unusual or outstanding visual quality within the character type. They are therefore usually not common in the character type (but may be common in a sub-type). Class B - Common, refers to those areas where features do contain variety in form, line, color and/or texture, but to a degree that tends to be common throughout the character type. The features are not outstanding in visual quality.

Class C - Minimal, refers to those areas whose features have little change in form, line, color and/or texture. Class C includes all areas that do not fit into Classes A or B.

The landscape character types are based on physiographic sections as defined by Fenneman in "Physiography of the Western United States."

From the character type, variety classes of the landscape were determined and mapped (see Map 1).

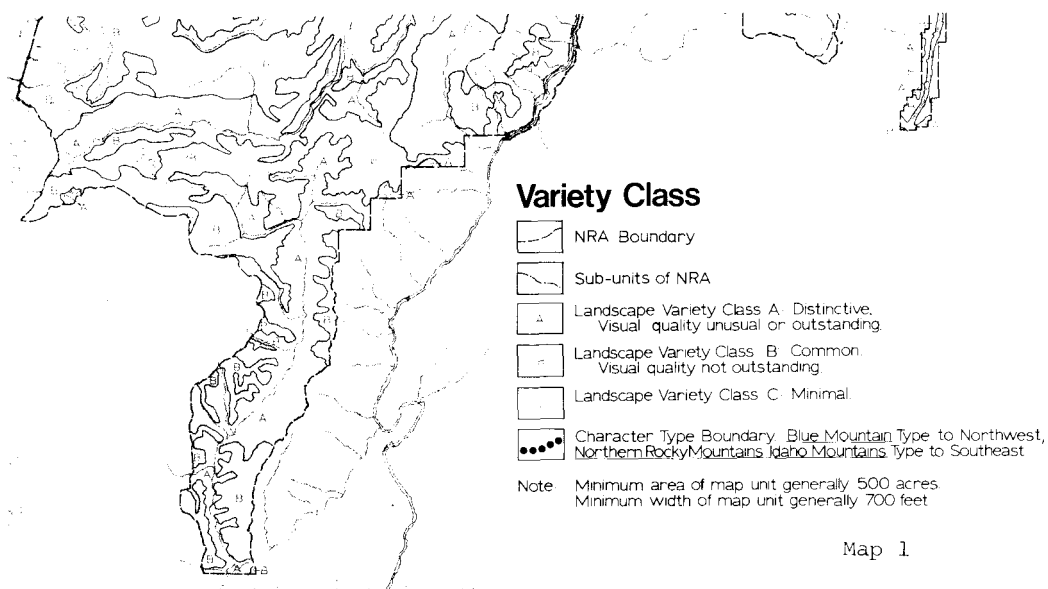
SENSITIVITY LEVEL

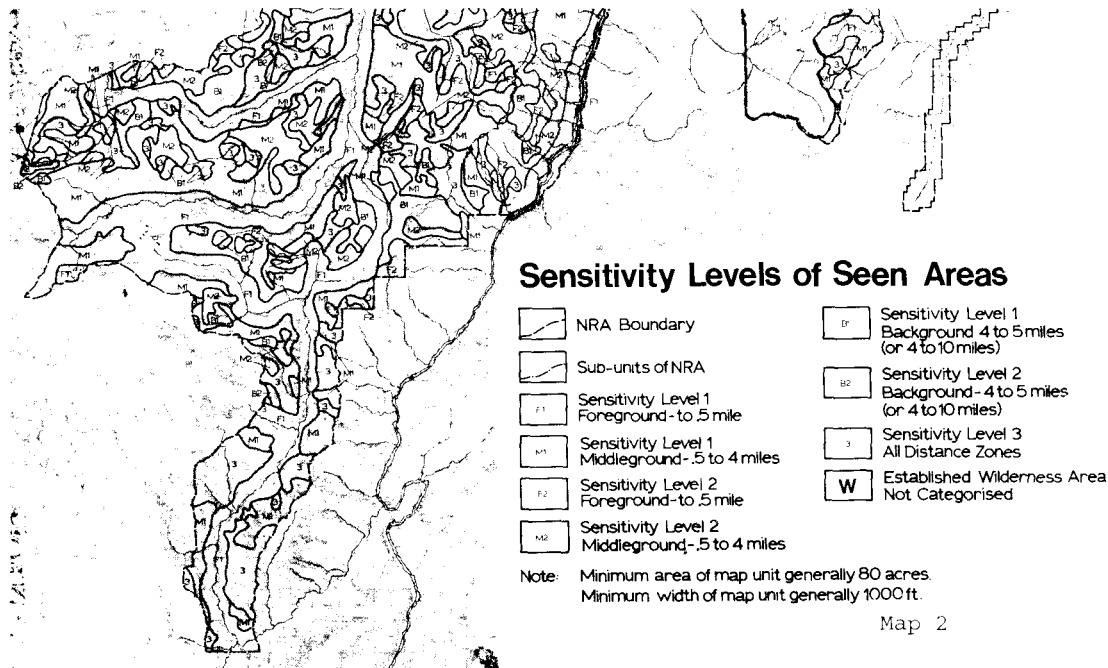
Sensitivity levels are a measure of people's concern for scenic quality. The sensitivity measured is not that of a viewed landscape to a given disturbance. Rather it is the mental state or level of expectation of scenic quality of the users of the NRA, whether recreationists, local inhabitants, ranchers, forest products workers or Forest Service personnel.

Three sensitivity levels are used, each identifying a different level of user concern for the visual environment. These are:

- o Level 1 - Highest Sensitivity
- o Level 2 - Average Sensitivity
- o Level 3 - Lowest Sensitivity

Measurement of visitor sensitivity to the visual environment is necessarily somewhat subjective. A two-step process is used here. First, the travel routes, use areas and water bodies (the principal locations of the users of the NRA), are identified as being of either primary or secondary importance within the NRA. Secondly, the types of users of each use feature are identified and assumptions made as to their concern for visual quality. The importance and the users concern are then correlated and final sensitivity levels determined.





The VIEWIT computer program was used to assist in determining the sensitivity levels. This process uses predetermined viewpoints, whose coordinates are fed into the computer along with the radius of view the computer is to scan. Seven hundred eighty (780) viewpoints were used to cover 1000 square miles.

The sensitivity level computer printout was then manually transferred to the base map as is shown in Map 2 above.

VISUAL QUALITY OBJECTIVES

In the previous two steps of the process, the inherent scenic quality (variety class) and the public's concern for scenic quality (sensitivity level) were defined for all lands within the NRA.

This third step combines these two values and thus determines various degrees of acceptable alteration of the natural-appearing landscape. That is, visual quality objectives (VQO's), can now be defined for all areas of the NRA, including areas where cultural patterns are conspicuous, since the types of cultural features that exist in the NRA are generally seen as part of the characteristic landscape and should be treated as such. These objectives dictate the type, scale and extent of management activities that may be performed.

Five Visual Quality Objectives are used. These are:

- o Preservation P
- o Retention R
- o Partial Retention PR
- o Modification M
- o Maximum Modification MM

These objectives are derived from, and keyed to, the variety classes and sensitivity levels previously defined. Each describes a different degree of acceptable alteration of the natural landscape. The degree of alteration is measured in terms of visual contrast with the surrounding landscape that is generated by introduced changes in form, line, color or texture.

The VQO's for the National Recreation Area are set as if the landscape was entirely natural and contained no management-caused visual impact. In fact, there are areas where existing visual intrusions (roads, clear cut areas, transmission lines, etc.) may not meet the VQO's that this study defines. In these cases, a short-term visual resource management goal -- rehabilitation, may be applied. Once the short-term goal is attained, the original VQO then applies to all subsequent management activities. The definition of areas that require rehabilitation was beyond the scope of this study (see Map 3).*

VISUAL ABSORPTION CAPABILITY (VAC)

Visual Absorption Capability (VAC) is a measure of the relative ability of the land to absorb visual change. VAC assessment is designs to indicate the best locations for a proposed management activity within a given VQO area.

*See color illustration on page 393.

There are numerous factors that influence Visual Absorption Capability. These can be divided into perceptual factors and physical factors. Perceptual factors include: distance, number of times seen, number of viewers, duration of view, focal point sensitivity, slope relative to observer, etc. Most of these factors require exact and minute knowledge of the land to be assessed (obtainable only by site examination) and/or much detailed knowledge of the viewers.

Thus, they are suitable for project level assessments where viewers are located in a limited area, perhaps along one road, but are impracticable for large-scale land use planning projects such as this one, where the area is too large for all portions to be seen in the field and where the exact type, number and location of the viewers are not always known.

Physical factors are variable aspects of the land, such as slope, that change the inherent visibility of a given management action as they vary. For example, slope varies from flat to steep. Other physical factors being equal, a given management activity such as construction of a road, will be inherently more visible when performed on an area of steep slope than on flat land.

Four physical VAC factors have been selected for examination on the NRA. These are:

- o Slope
- o Vegetation type
- o Soil type
- o Soil/vegetation color contrast

A number of Forest Service VAC studies were examined and the VAC factors that had been used on large-scale land use planning studies were listed. The above four factors were selected (using the list as a starting point) because, in the course of extensive site visits, each had been observed to be significant and to vary widely in the NRA. In addition, reasonably complete data were thought to be available for these factors. Each factor was divided into three classes of visual absorption capability; high, moderate and low. The conditions classed high are those with the most capacity to absorb visual change; the easiest, lowest cost areas in which to perform management activity from the visual resource point of view. Conversely, low VAC areas are those which do not absorb much visual change. It is more difficult and costly in these areas to carry on management activities and still attain the visual quality objectives defined.

Before the total, or composite, VAC values of all of the parts of the NRA can be assessed, the relative weight of each of the four subsections must be determined. This must necessa-

rily be done by subjective judgment. Based on the past experience of the Forest Service, and on an understanding of the relative importance of the four factors derived from site examination, relative VAC values were determined and are shown on Figure 3.

FACTOR	CHARACTERISTICS	VAC VALUES	
		VERBAL	NUMERICAL
Slope	Steep (55%+ slope)	low	1(multiplier)
	Moderately steep (25%-55% slope)	mod.	2(multiplier)
	Relatively flat (0-25% slope)	high	3(multiplier)
Vegetation	Barren, grass/brush	low	1
	Conifer, hardwood, cultivated altered	mod.	2
	Diversified (mixed open and woodland)	high	3
Soil	High constraint value derived from high erosion hazard and/or high instability hazard and/or poor regeneration potential	low	1
	Moderate constraint value derived from erosion hazard and/or instability hazard and/or regeneration potential	mod.	2
	Low constraint value derived from low erosion hazard and/or low instability hazard and/or good regeneration potential	high	3
Soil/ Vegetation Contrast	High visual contrast between exposed soil and adjacent vegetation	low	1
	Moderate visual contrast between exposed soil and adjacent vegetation (and all barren, cultivated and diversified vegetation types)	mod.	2
	Low visual contrast between exposed soil and adjacent vegetation	high	3

Figure 3. Relative Importance of VAC Factors.

In summary, Vegetation, Soils and Soil/Vegetation color contrast are all weighted equally and in an arithmetically increasing scale. The lowest slope VAC value has no effect on the sum of the other three, a moderate slope VAC doubles the sum and a high slope VAC triples the total of the remaining factor values. Thus, the final Visual Absorption Capability Values are derived from the formula:

$$\text{Total VAC} = \text{Slope VAC} \times (\text{Veg. VAC} + \text{Soil VAC} + \text{Contrast VAC})$$

The formula for calculation of total VAC -- Slope X (Veg. + Soil + Contrast) was applied, giving a single numerical value for each map unit. The lowest possible score is $1 \times (1 + 1 + 1) = 3$. The highest possible score is $3 \times (3 + 3 + 3) = 27$. The frequency of occurrence of the various total VAC scores was estimated by sampling a number of randomly selected areas of the NRA and dividing the range so that the number of low, moderate and high scores was, as nearly as possible, equal. This grouped the numerical scores into the three categories: low, moderate

and high. The final total or Composite VAC Map was then produced (see Map 4). *

COMPOSITE VQO/VAC VALUES

Once the VQO and the VAC of an area had been mapped, a composite map was made showing relative ease or difficulty of accomplishing various management activities. This composite can be used to influence the location of specific projects required in the new NRA, as well as the methods used to design, construct and maintain these projects.

The composite VQO/VAC map units, or visual Management Classes, were obtained by overlaying these two maps and defining new units.

The units are defined, not on the basis of the simple VQO's themselves, but of the various combinations of Variety Class and Sensitivity Level that determined the VQO's. For example, a Sensitivity Level I Middleground on the Variety Class A land both have the Partial Retention (PR) Visual Quality Objective. Composite VQO/VAC units are defined on the basis of each of the above two VQO units, not just for the overall PR VQO condition. This makes it easier for the land manager to refer back to the VQO map to find the specific combination of variety class and sensitivity level of seen area that determined the VQO.

Map 5 is the combination of the Visual Quality Objective Map and the Visual Absorption Capability Map.

IMNAHA VALLEY STUDY

The Imnaha Valley lies within the NRA, but differs from it in several important ways. Whereas the bulk of the NRA is publicly-owned and undeveloped, the Imnaha has significant amounts of private land within it, often developed as irrigated pasture or cropland and has many homes and ranches.

The Act establishing Hells Canyon NRA (December 1975) states that ranching, grazing, farming, timber harvesting and the occupation of homes and lands associated with these activities (as they existed at the time of enactment of the Act) are recognized as traditional and valid uses of the National Recreation Area. The Act also states that standards for the use and development of privately-owned property within the NRA shall apply. It is one of the main

purposes of this Imnaha Valley study to provide suggestions and recommendations from the point of view of visual quality, that will enable the NRA planning team, with the involvement of the private landowners affected, to develop such standards. This study is also intended to assist the NRA planners to locate management activities on the publicly-owned lands within the Imnaha Valley and to ascertain the probability of any proposed private development having an adverse visual effect.

The Valley study consists of three parts:

- (1) Three pairs of data maps that supplement the NRA-wide visual resource inventory maps and give a more detailed picture of the Imnaha Valley. The data maps are:
 - o Land Ownership (North and South halves)
 - o Land Use (North and South halves)
 - o Visibility: Times-Seen (North and South halves)
- (2) Sequential views at about one mile intervals of progressions through the Valley north to south and south to north with a description and an overall map-diagram illustrating the relationship of the viewer, moving along the main Valley road to the major topographic and cultural features of the Valley.
- (3) Suggestions and Recommendations for planning and other design standards that might be applied to new and existing development in the Valley. These consist of:
- (4)
 - o Illustrations and discussions of some existing agricultural operations and residential developments that fit well into the NRA.
 - o Illustrations of situations in or near the Imnaha Valley portion of the NRA that detract from the visual quality of the area with graphic illustrations and descriptions of possible improvements.
 - o Illustrations of some different levels of residential development in the Imnaha Valley with discussion of the effect of these on the visual character of the Valley.

Figure 4 on the following page is one of six series of sketches that represent the visual experience as one progresses through the Valley.

*See color illustration on page 393.



Map 5. Composite VQO/VAC Value

The sequential views from the road (and the previous three sets of data maps) reveal two important points about the Imnaha Valley.

- (1) It is relatively consistent in character. Although there are some locations that give more extensive views than is general, mostly these views do not consist of exceptional or unique combinations of form, line, color and/or texture. They merely reveal more than usual of the typical Valley floor, not of any unique land form in the Valley itself.
- (2) Cultural patterns dominate the Valley and determine its visual character. This is especially true in the central segment of the corridor, between the two main lateral roads that give access to it; that is, the road from the south that enters the Valley nine miles from its south end and the road from Joseph to the community of Imnaha. This is the segment that will probably receive the most recreational use. The natural features of the Valley, as seen from this segment of the road, serve mainly to complement the cultural patterns.

The above two observations lead to the conclusion that the most effective means of influencing the visual character of the Valley is not the outright protection of a few critical areas, but rather the maintenance of effective controls on all cultural developments, on a site specific basis, as they occur at any point along the Valley corridor.

Figure 5 illustrates four examples of developments that fit well into their environments.

Figure 6 is an example of existing developments that may be considered visually intrusive. Suggestions for improvements that could reduce visual intrusion are made and illustrated.

Figure 4
Sequential Views Moving North (South Half)

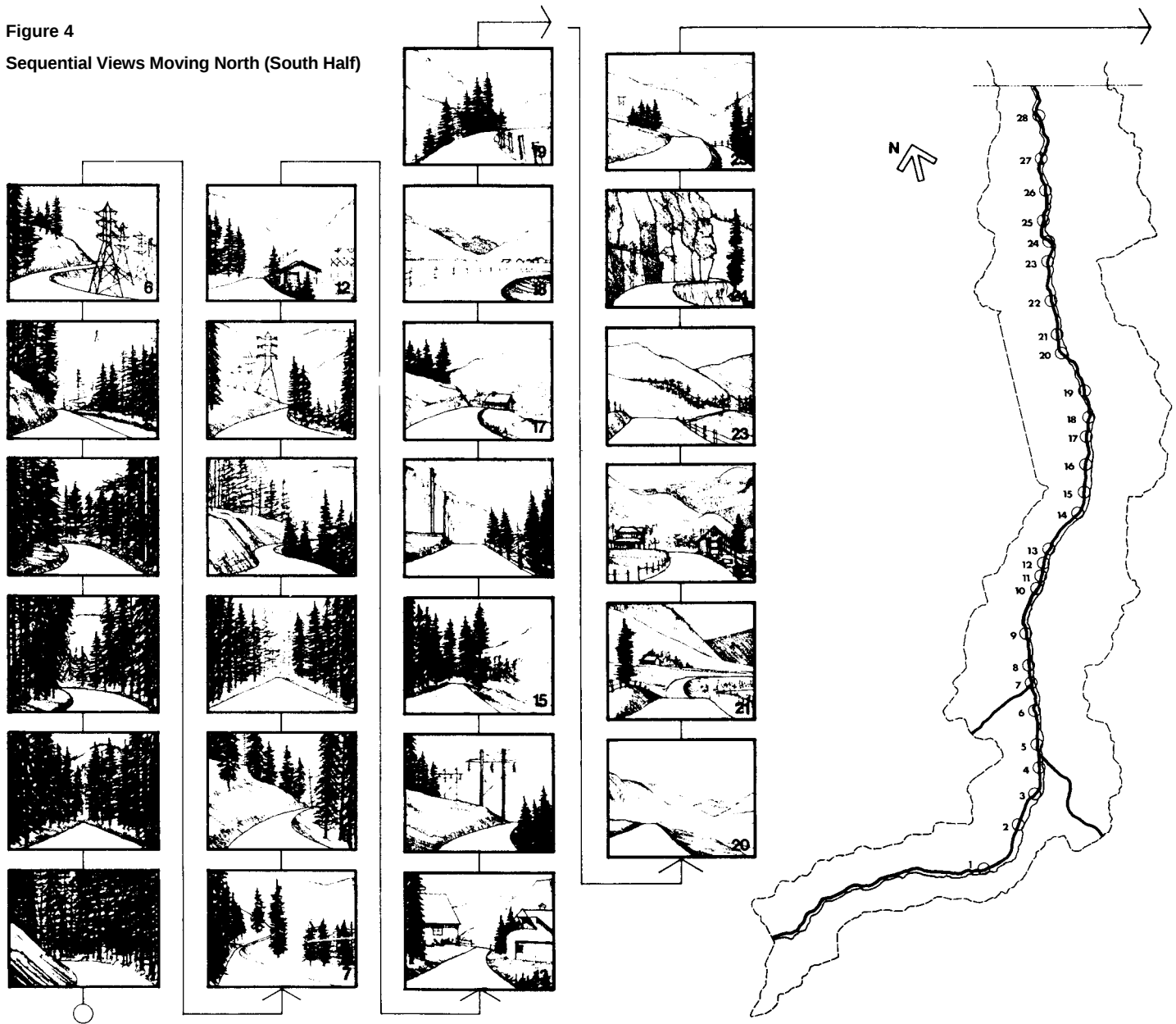


Figure 5 Visually Attractive Development

BARN

This small barn illustrates several of the characteristics that help a building fit into the Imnaha Valley setting. Its style is typical of the older buildings in the Valley. The barn is relatively small in size, dark in color, simple in form, faced entirely in natural materials and closely related to a backdrop of trees.



FEED LOT

This feed area, though unusual in shape, is of typical size. From the visual point of view, it is entirely appropriate as a working element in the visual environment of the Valley. The fence is simple, functional and direct in design.



OLD RESIDENCE

This old and apparently unoccupied ranchhouse is an example of the original style of residence used in the Valley. Its steeply pitched shingled roof and dark timber faced walls harmonize perfectly with the dominant colors, textures and forms in the surrounding landscape. The building is, like the barn illustrated above, small in scale, simple in form and closely related to massed vegetation which visually ties it to its surroundings.



NEW RESIDENCE

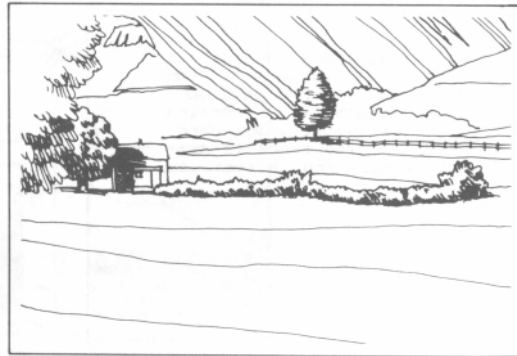
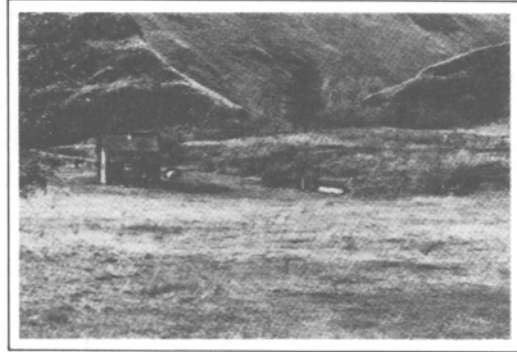
This relatively new residence (in the near middleground, right of center) is not finished in natural materials to the same extent, but it fits into its surroundings extremely well. The pitched asphalt tile roof is a subdued dark green and harmonizes with the color of the woods in the background and the form of the Valley slopes. The house is unobtrusively sited and visually related to its immediate surroundings by the planting, generally natural in appearance, around it.



Figure 6 Buildings

SMALL SCALE BUILDING

The location of this small building in an open grassy area, not closely related to significant vegetation masses, is visually somewhat intrusive and leaves exposed to view outbuildings, propane tanks and stacked construction materials. It could be improved in two ways by the addition of plant material; the small elements would be screened and the building visually tied to its environment.



LARGE SCALE BUILDING

This modern metal-faced barn, though larger than most buildings in the Valley, is simple, functional and well designed. It would fit better into the visual environment if its roof were darker in color. Planting one or more tree and shrub masses, partly in front of the building (as seen from the main Valley road) would break up its large bulk and relate it to the surrounding land forms.

