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AESTHETICS OF WILD AND SCENIC RIVERS
A METHODOLOGICAL APPROACH

by

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by E. L. Michalson

The purpose of this report is to develop a method of evaluating aesthetic appreciation of wild and scenic rivers. An attempt has been made to develop a general methodology which may be used to quantify aesthetic characteristics of wild and scenic rivers. This goal was at least partially achieved, given the difficulty of the task. The procedure described herein does not definitely inventory all characteristics of wild and scenic rivers, however, it does provide a logic which, if followed, will arrive at a reasonable approach to the problem of quantification.

The original project under which the work herein was done was entitled "Socio-Economics of Wild and Scenic Rivers." This research project consisted of four independent subprojects. These subprojects were concerned with:

1. Developing a national survey questionnaire;
2. Assessing local, state and national attitudes on wild and scenic rivers;
3. Determining the social-economic carrying capacity of wild and scenic rivers;
4. Evaluating the aesthetics of wild and scenic rivers.

The overall purposes of the original project were to: (1) expand and continue the research which had its beginning with the Wild Rivers Methodology Study;¹ (2) assess and correlate public attitudes and desires concerning the selection, use, and management of wild and scenic rivers.

The aesthetic subproject was proposed assuming that adequate aerial photography would be available on the Salmon River. A selected set of aerial photographs was made available by the U.S. Forest Service, but unfortunately, the scale at which these photographs were taken was too small for any detailed work. Because of the cost involved in getting the type of coverage which would be required to do an adequate job with aerial photography, this approach was dropped from the project.

A second purpose of this subproject was to obtain human reactions or responses to aesthetics. Particular attention was to be directed toward scenic beauty, response to activity participation, and interest in the historical or cultural heritage of the areas studied.

The aesthetics subproject had two specific objectives; these were to:

1. Define outstandingly scenic areas of the potential and instant wild rivers in Idaho.
2. Develop a method of quantifying aesthetic experiences.

These objectives were designed to cover two needs which exist in evaluating wild and scenic rivers. The first was the problem of uniqueness. The question to be answered is, what makes a wild and scenic river like the Salmon River in Idaho unique? The answer is either very obvious, or very difficult depending upon how one approaches the question. The river is obviously unique because there is only one Salmon River, Priest River, St. Joe, Mayie, or Bruneau River. If one approaches the question from the viewpoint of what it is about the river which makes it unique, then the answer is not so easily determined. What land forms are aesthetically

important? What other resources need to be considered? What role does human perception play in determining the aesthetic uniqueness of a river such as the Salmon River?

Data from other rivers besides the Salmon River have been used in the attempt to describe, define and evaluate aesthetics. Data and photographs from the St. Joe River in northern Idaho, the Stanley Basin area of the upper Salmon River, and from the Middle Fork Salmon River were also used in various phases of this research effort. The purpose of using this additional data was twofold--first, to broaden the base for drawing conclusions, and second, to utilize a data available in these river areas on human responses to aesthetics. This latter point is relatively important in that the consistency of responses to river environments by recreationists was evaluated.

Review of Literature

Very little literature exists on the aesthetics of wild and scenic rivers per se, but a very large body of such literature exists on the general topic of aesthetics. Aesthetics, as typically discussed, is considered as an art form. Most tests on the subject deal descriptively with the subject because this is the way it has been traditionally understood. As a result, some example definitions of aesthetics will be presented in this section and a review of some of the current literature will be made.

The traditional concept of aesthetics has been largely defined in the fields of art and philosophy. According to James L. Jarrett, aesthetics is the study of the aesthetic experience.² Aesthetic experience can be defined in terms of the quality, attitudes and

values involved. Aesthetics is not a science, rather it is the study of beauty and art. Aesthetics is hypothetically a branch of philosophy, which aims at the clarification of general norms employed in the appraisal of various aspects of the universe.

According to an older source, aesthetics, as defined by G. L. Raymond, in 1909 is a word which can be traced back to a work titled "Aesthetics" published by A. G. Bumgarten in 1750 in Germany.³ The word is derived from the "Greek" and means fitted to be perceived. It is now used largely to designate what philosophers term perception.

A present day definition of aesthetics is provided by Websters New World Dictionary, College Edition, - Aes-thet-ics (es-the'iks), n.pl. (construed as sing) {'aesthetic}. The study of philosophy of beauty; theory of the fine arts and peoples' response to them: also spelled esthetics.⁴

The recognition that water resources projects have an aesthetic aspect is reflected in the work of S. E. Gauger and J. B. Wycoff, who state that:

"The meaning of environmental enhancement can be considered by defining man's environment as the world in which he lives. Improvement of this environment comes about not only through the provision of physical comforts, but also by the aesthetic design and quality of all man made modifications of physical features."⁵

It is clearly evident that the definitions used to describe aesthetics are somewhat ambiguous and vague. The reasons for this is that the concept is not well understood by practioneers of the art of evaluating aesthetics. It appears to be that aesthetics is something which can be appreciated and not defined.

A need, however, exists for an operational type of definition

which can be used to describe aesthetics. The definition used in this study is that aesthetics are those things which appeal to a person's sense of beauty and order. This appeal is expressed in terms of a general reaction to the outdoor environment as seen from a river or on the banks of a river. The aesthetic concept is defined in broad terms which reflect a person's reaction to the whole environment and not limited to single specific objects or areas of the river, although these are not excluded either. To be more specific, it is aesthetic reaction to the area of the river in which he or she was visiting or recreating. This definition tends to differ from others in that feature objects are not emphasized and general visual reactions are emphasized. The reason for this is that rivers move and the visual scene is always changing. A second point is that the excitement of rapids, and ephemeral landscapes also occurs as one travels along. Aesthetic appreciation of river experiences is made up of the totality of the river experiences, many of which are sensory in nature.

The art of human communication is limited in expressing many aesthetic experiences and an attempt in this study has been made to develop a procedure of expressing these reactions which can be used as a means of measuring in an ordinal way how important they were to the person who had the experience.

Methodology

In this study, use was made of slides to depict scenic views of river basins, personal evaluations in a part of the analysis, and statistical procedures to develop quantitative value estimates for

aesthetic features of the recreation experience.

In the first case the procedure followed was to go out into the river areas described above with a 35 mm camera and take a series of pictures (slides) which captured on film typical scenes along these rivers. These typical scenes included both run-of-the-mill type scenes, outstanding features and on occasion human interest pictures. In this manner, an inventory of scenes along the Salmon River was developed.

The second phase of the methodology was an attempt to develop a scenic evaluation technique which relied upon using the slides and showing scenes along the river which an audience was to evaluate. A number of techniques was attempted. These attempts basically followed the same pattern. This pattern was that of showing the viewers a set of two or three slides and asking them to rank or evaluate these slides based on their opinion of the slides as shown. A questionnaire was furnished each viewer and about 10 sets of paired (usually 30 minutes) slides were shown each time.

The third technique used, which was the most successful, was the statistical methodology to develop demand curves for outdoor recreation combined with the development of a Likert-Type scale used to distribute the various aspects of the recreationists' group reaction to their outdoor experience. The complexity of evaluating the wild river type of outdoor recreation experience required the use of a number of methods in order to come up with reasonable results.

Data Sources

The data used in this study consisted of color slides, taken on various wild and scenic rivers in Idaho. These color slides were taken on the river by various researchers in the course of carrying out their studies. The slides cover a wide range of conditions and situations on the river looking both at attractive features and at problem areas.

The second type of data used in this study was survey data where individual recreationists responded to a questionnaire dealing with these recreational experiences and their appreciation of the various aspects of their recreational trip on the river in question. The data were obtained over a period of years beginning in 1969 and ending in 1973. These data were obtained on the rivers mentioned under procedures. They also were the data used to develop the recreational demand functions on which much of which follows in this manuscript is based. Included in the survey were sets of questions on the socio-economic characteristics of the recreationists, costs of their recreation experience and a set of evaluation questions relating to the experience.

Wild and Scenic River Generalized Landscape Types

The inventory of landscapes used in this study relied upon landscape types developed by Burton Litton.⁶ A brief review of these landscapes follows:

1. Panoramic Landscape (Figure 1) - Little or no sense of boundary or restriction. Foreground or middle ground objects do not substantially block viewing of background objects. Flat horizontal planes such as lakes, rolling

prairies, or an observer's superior outerview of fairly uniform mountainous terrain typically allows this type of classification.

2. Feature Landscape (Figure 2) - Dominating feature object or groups of feature objects. Objects that surround the feature must be subordinate to it. The size of this landscape type is usually directly proportional to the sphere of visual influence the feature or features bear to its surroundings, (i.e., massive feature objects influence usually extends to the farthest point from which it may be seen).
3. Focal Landscape (Figure 3) - A series of essentially parallel objects seen in alignment create a focal landscape. The observer must be in a position such that his lines of sight parallel those of this landscape type. The presence of a feature terminus at the point of convergence of the parallel line tends to enhance this landscape type.
4. Enclosed Landscape (Figure 4) - Spaces, both large and small, which are surrounded by continuous groupings of objects. Enclosed landscapes can be defined in terms of walls and floor (a meadow - the trees surrounding it form the walls and the meadow is the floor). When wall definition is lost because of distance, the panoramic classification becomes more appropriate.
5. Ephemeral Landscape (Figure 5) - This type depends on transitory effects. Five groups of influences create an ephemeral landscape. They are (1) atmospheric and weather conditions, (2) projected and reflected images, (3) displacements, (4) signs, and (5) animal occupancy.

A final factor important in classifying landscape types is the observer position. Observer position is where the individual is viewing the landscape from. There are three observer positions.

1. Observer inferior - The observer is essentially below the surrounding or nearby landscape.
2. Observer normal - The observer has a land line of sight which generally coincides with the dominating elements of the landscape.
3. Observer superior - The observer is above and is looking down on the landscape.

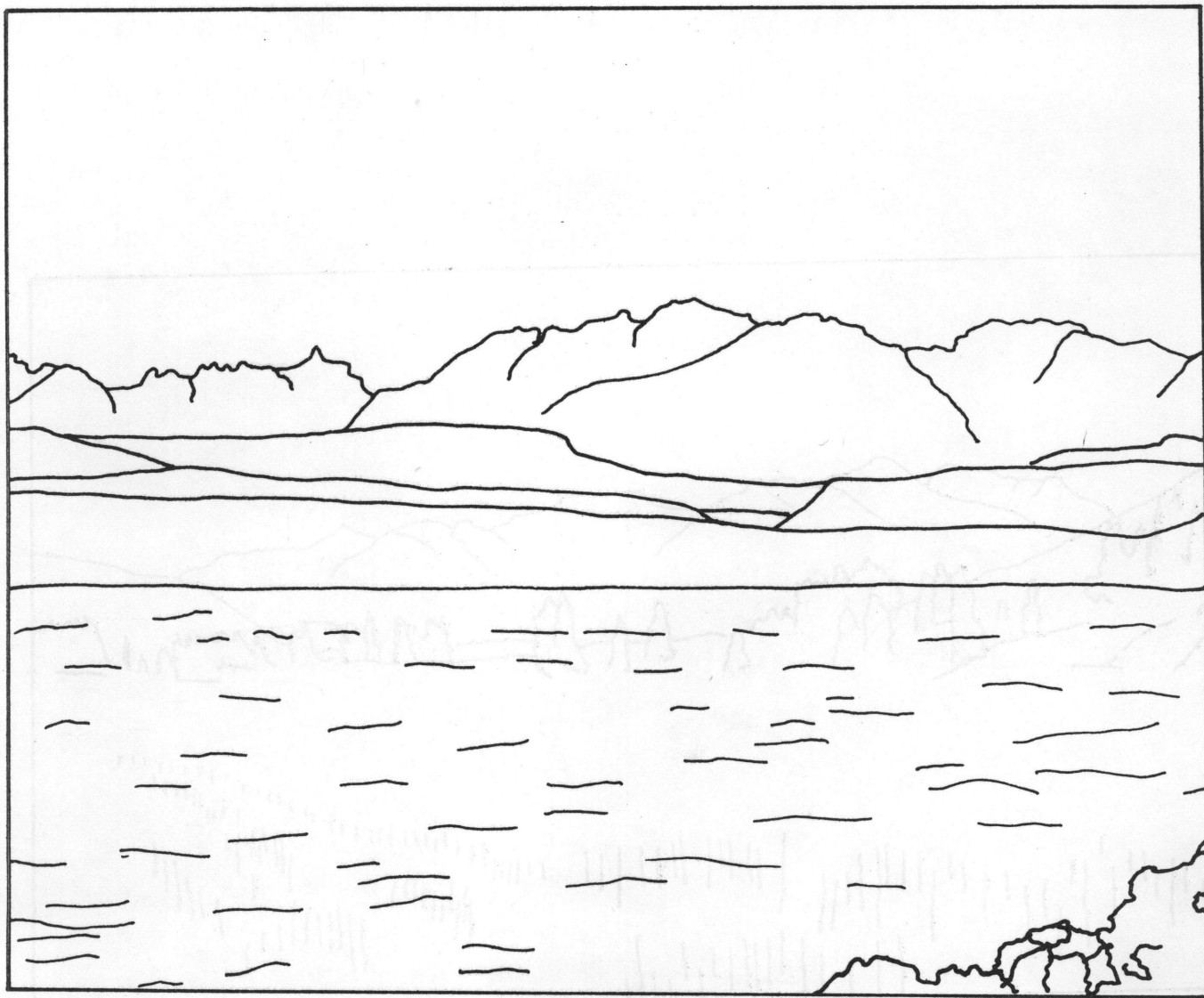


Figure 1. Generalized panoramic landscape type.

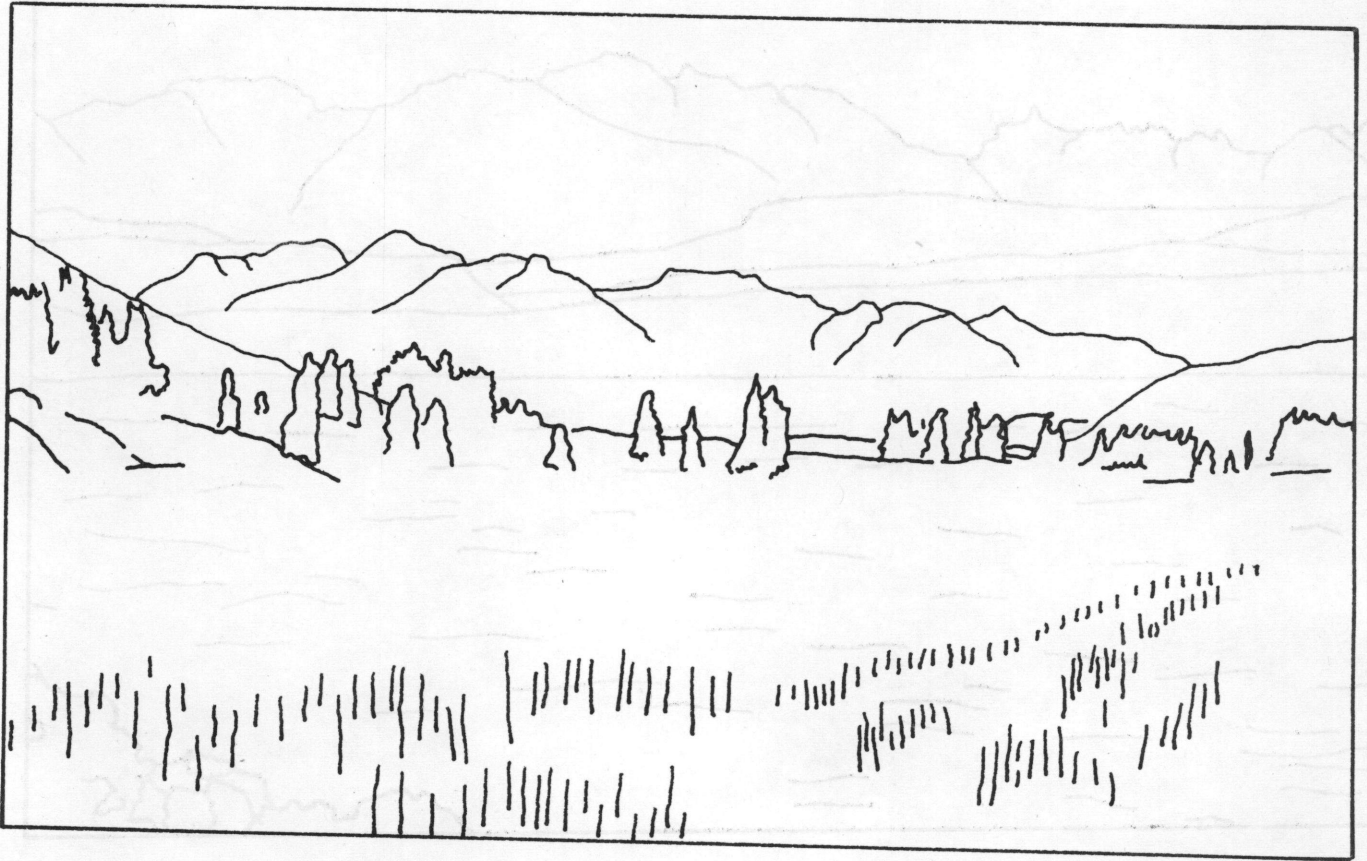


Figure 2. Generalized feature landscape type.

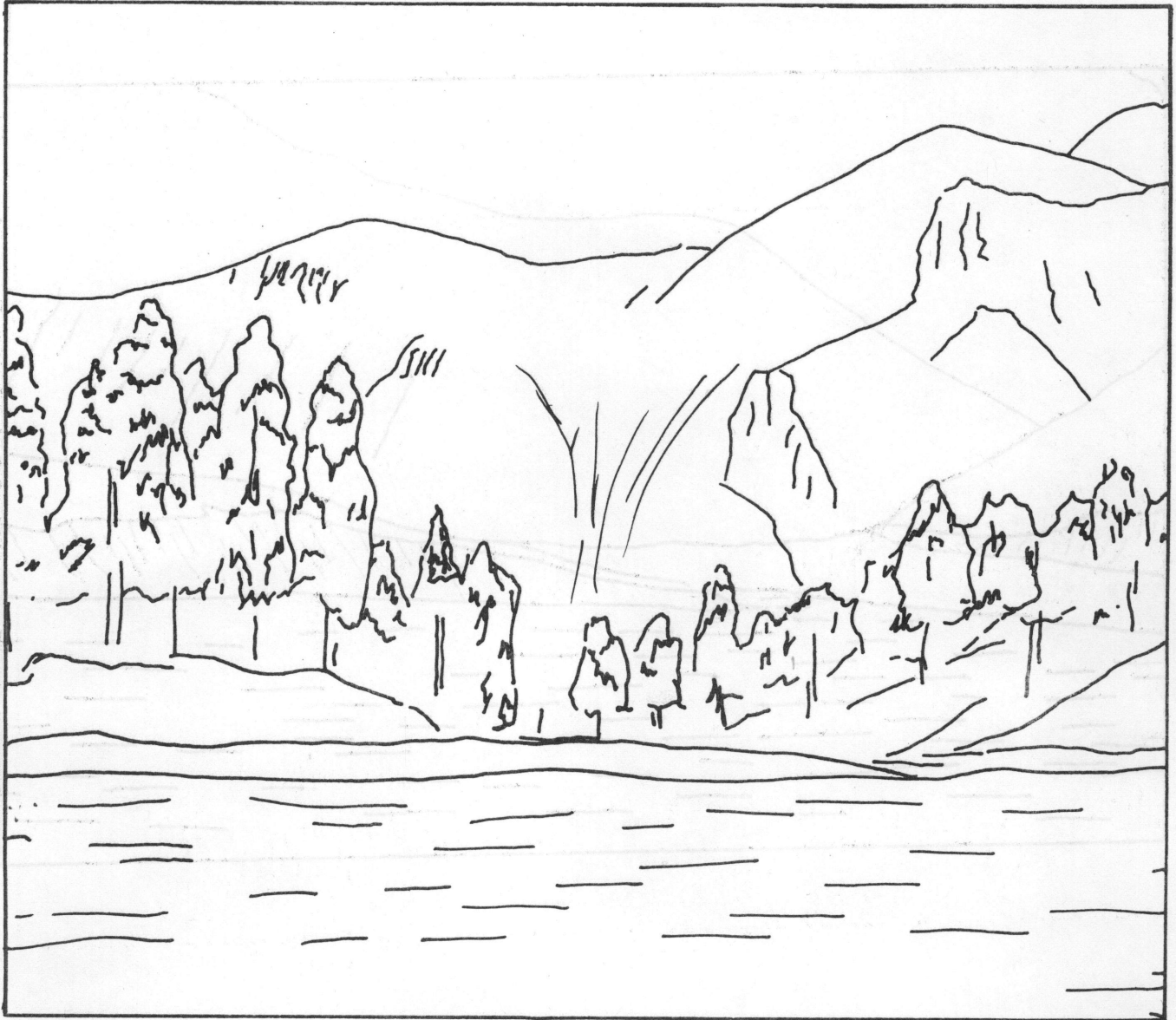


Figure 3. Generalized focal landscape type.

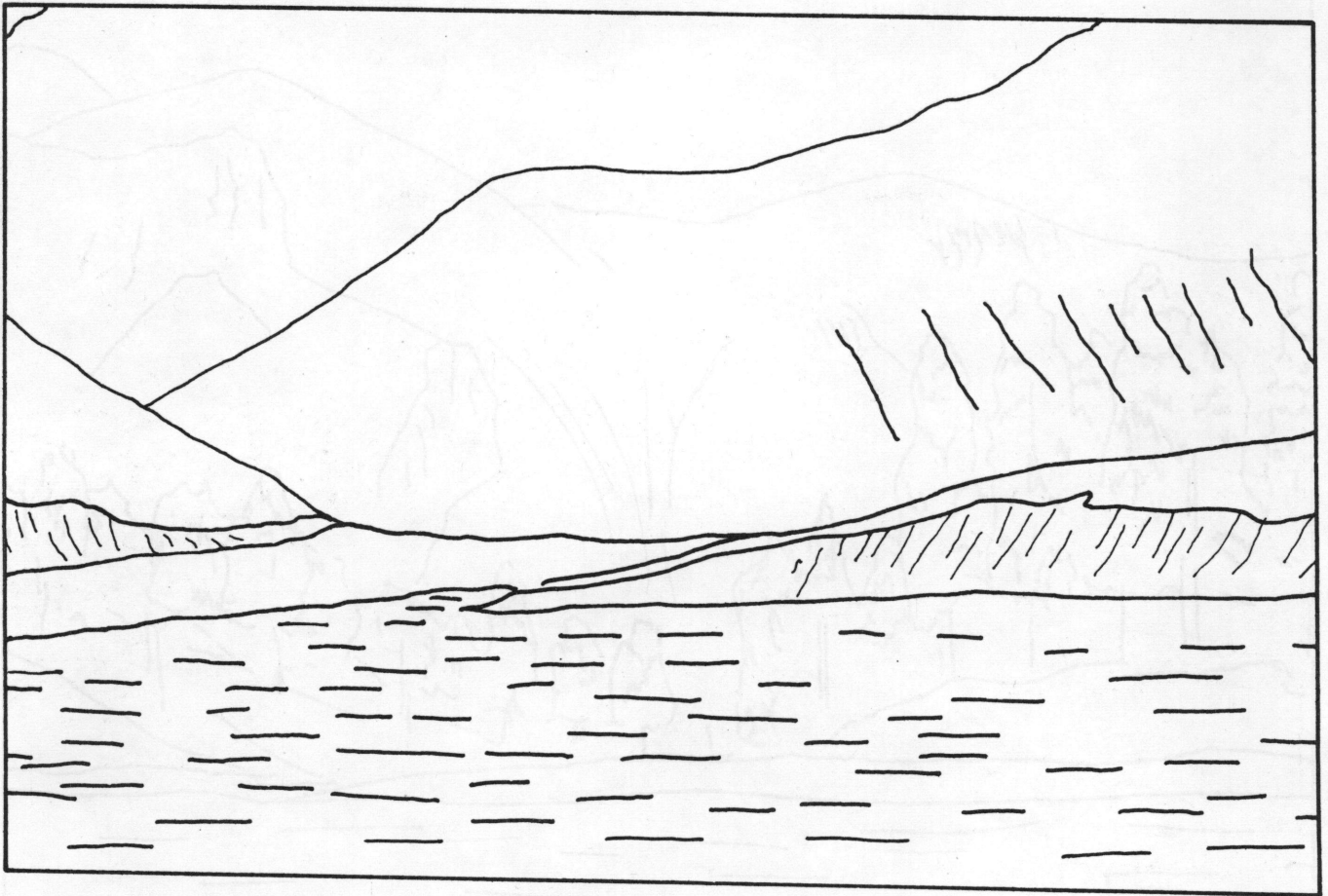


Figure 4. Generalized enclosed landscape type.



Figure 5. Generalized ephemeral landscape type.

In a wild river situation it is assumed that for the most part the landscape is viewed from the river, or along the river bank (roads, trails, sand bars, etc.). Therefore the most frequent observer position will be observer inferior.

An inventory of color slides was developed for the Salmon River using "Litton's" generalized landscapes. This inventory consisted of a color slide taken at approximately one mile intervals all along the 425 mile river. The inventory of slides presented in this section is a set of representative scenes taken at various points along the river. These scenes are typical of what a typical recreationist would see as he travelled along the river. The three rivers which were studied in this research were classified by landscape type.

The Salmon River can be generally classified into the following landscape types in terms of openness versus closure.

1. OPEN - from above Obsidian to Stanley, Idaho.
2. SEMI-CLOSED TO CLOSED - from below Stanley to above Round Valley in the Challis, Idaho area.
3. OPEN - upstream and downstream from Challis, Idaho.
4. CLOSED - from above Ellis to about Williams Lake above Salmon, Idaho.
5. OPEN - upstream from above North Fork to above Salmon, Idaho.
6. CLOSED - from above North Fork to the mouth of the river. The valley tends to open up somewhat around Riggins and White Bird, Idaho, and also in the lower reaches of the river.

The Middle Fork Salmon River can be generally classified into the CLOSED type of landscape over the whole river. This river runs

through a mountainous area, and the river runs through a canyon which has steep walls.

The St. Joe River can be classified into the following general areas:

1. OPEN - SEMI-CLOSED - from Beedle Point to St. Maries, Idaho.
2. SEMI-CLOSED - from St. Maries to St. Joe City.
3. CLOSED - St. Joe City to St. Joe Lake, the river's origin.

The openness and closure of the stream is important in determining what landscape types will be seen from the river. Panoramic landscapes will only be seen in open zones where the river valley broadens. Conversely, an enclosed landscape will only be seen in the closed or semi-closed zones. With these elements in mind, the landscape types which may be seen along wild and scenic rivers can be determined. An inventory of slides is included to demonstrate this for the Salmon River. The set of slides begins near the headwaters of the Salmon River and works its way downstream through the general areas classified under the openness-closure system developed for the river above, see Slides 1 through 19.

List of Slides

Slide #1 - South of Stanley: This slide shows an example of what is found in zone 1, open. This is a panoramic landscape, and as mentioned before, the broad valley is conducive to this kind of landscape.

Slide #2 - Deer Across From Mormon Bend Campground: An ephemeral landscape. If deer were frequently sighted at this spot, then the site could be called a "permanent" or "frequent" ephemeral landscape and would be included as such in a detailed landscape inventory.

Slide #3 - Yankee Fork Dredging: The Forest Service uses an additional landscape classification called "problem landscape," which is self-explanatory. Although this is found on a tributary, an area such as

this might be classified as a problem landscape. A decision would have to be made as to whether the historical significance of the site outweighs the aesthetic potential.

Slide #4 - Salmon River near Clayton: Although it lacks a terminus feature object, this slide shows a good example of a focal landscape. This was taken in zone 2, a semi-closed to closed zone.

Slide #5 - Salmon River Valley North of Challis: Although it could be argued, a panoramic landscape comes closest to classifying this landscape. Taken in zone 3, open.

Slide #6 - Mountains to East of Salmon City: A panoramic landscape found in zone 5, open.

Slide #7 - Pine Creek Rapids: Note that the valley is closed here. It will stay closed to various degrees all the way to the mouth of the river. Thus zone 6, closed, will most likely be devoid of any panoramic landscapes.

Slide #8 - Middle Fork Country: This slide exemplifies very well three elements used in analyzing the landscape not heretofore mentioned. These elements are foreground, middleground, and background. This slide was taken near the Middle Fork Peak Lookout.

Slide #9 - Middle Fork Country above Lookout: This slide shows what could possibly be seen if you climbed to the top of one of the ridges along the main Salmon; a panoramic landscape from the observer superior position.

Slide #10 - Crossing to Salmon River Lodge: Even though it lacks a terminus feature object, this landscape has some elements which tend to make it a focal landscape. Note how the water's edge on either side of the picture tend to draw your sight to the center of the picture. Note also the taller trees on the outside and the shorter ones to the center, producing the same effect.

Slide #11 - Below Salmon River Lodge: Going by just what the slide shows, this could be called an enclosed landscape. The area seems to be walled in or enclosed, much like a basin.

Slide #12 - Indian Head: A feature landscape.

Slide #13 - Big Mallard Rapids: The many rapids along the Salmon in this zone could conceivably be classified as feature landscapes in the sense that they are distinct features of the river and are part of what make the entire river in zone 6 unique.

Slide #14 - Devils Tooth Rapids: A feature landscape. No doubt this becomes a much more distinct feature in the winter.

Slide #15 - Downstream from South Fork: This slide points out the fact that there may be many focal landscapes, especially in zone 6, which focalize on nothing in particular. In a detailed landscape inventory, one might find himself judging between significant and insignificant focal landscapes.

Slide #16 - Mountain Sheep below confluence with South Fork: Once again, wildlife creating an ephemeral landscape.

Slide #17 - Salmon River Canyon from above White Bird: A panoramic landscape from an observer superior position.

Slide #18 - From the top of White Bird Hill: Another good example of foreground, middleground, and background.

Slide #19 - Salmon River Canyon from above White Bird, Idaho: A panoramic landscape. It is near this area that the Salmon partially "opens up" again before closing and converging with the Snake River.

Although this has been brief, it does give a sampling of what might be included in a wild river landscape inventory. The points to consider in the execution of such an inventory would be:

1. Determination of which portions of the river are interesting.
2. Determination of the observer position on or along the river.
3. Establishment of visual corridor boundaries (the most distant points of view as seen from the observer's position).
4. Location and mapping of landscape types.

After the inventory has been completed, a system can be worked out by which different features of landscape types of the river could be evaluated and ranked. Eventually, this could conceivably lay the ground work from which a system for evaluating and ranking wild and scenic rivers could be developed.

Aesthetic Perceptions

In trying to determine the relevance of aesthetic considerations as they affect wild and scenic rivers selection, evaluation, and management, an attempt was made to develop a ranked ordering of aesthetic



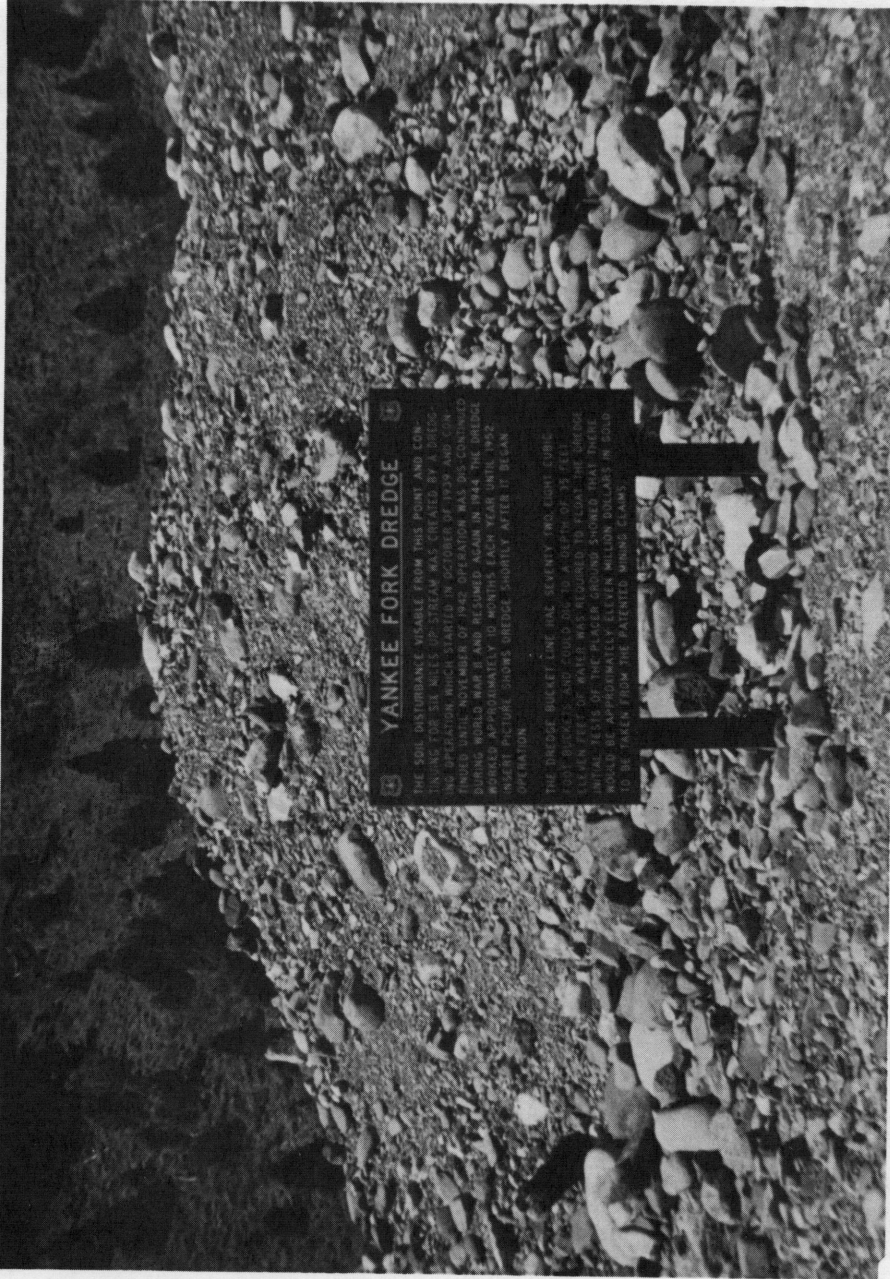
Slide #1

South of Stanley: This slide shows an example of what is found in zone 1, open. This is a panoramic landscape, and as mentioned before, the broad valley is conducive to this kind of landscape.



Slide #2

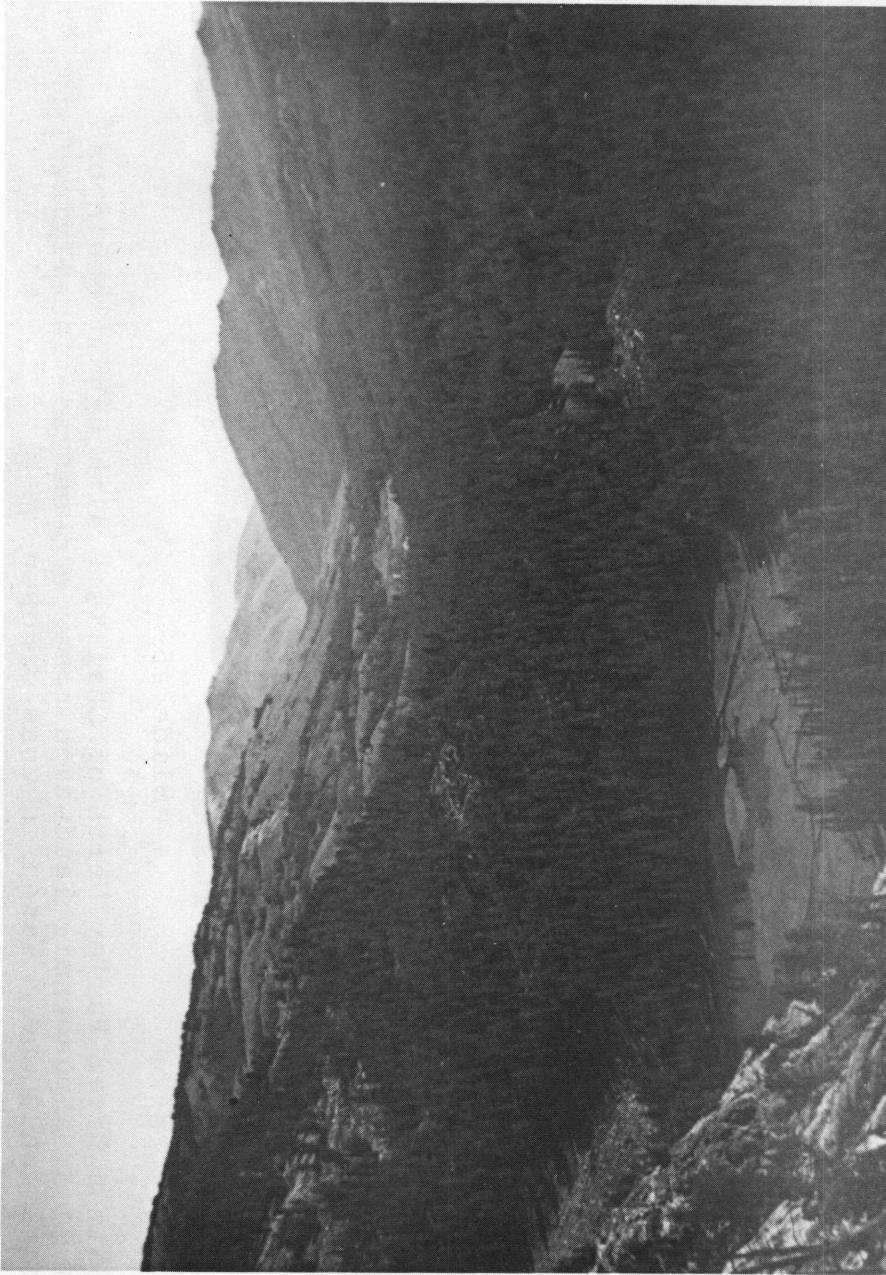
Deer Across From Mormon Bend Campground: An ephemeral landscape. If deer were frequently sighted at this spot, then the site could be called a "permanent" or "frequent" ephemeral landscape and would be included as such in a detailed landscape inventory.



4
YANKEE FORK DREDGE
 THE SOIL DISTURBANCE VISIBLE FROM THIS POINT AND DOWN-
 THE-RIVER FOR SEVERAL MILES UP STREAM WAS CREATED BY A DREDGE
 AND OPERATION WHICH STARTED IN OCTOBER OF 1939 AND CON-
 TINUED UNTIL NOVEMBER OF 1942. OPERATION WAS RESUMED
 DURING WORLD WAR II AND RESUMED AGAIN IN 1944. THE DREDGE
 WORKED APPROXIMATELY 10 HOURS EACH YEAR UNTIL 1952.
 INSERT PICTURE SHOWS DREDGE SHORTLY AFTER IT BEGAN
 OPERATION.
 THE DREDGE BUCKET LIFTED THE SEVEN AND A HALF CUBIC
 FEET OF WATER AND DEPOSITED IT ON THE BANK. THE DREDGE
 CLEARLY LEFT ON THE BANK WATER LOGGING SHOWED THAT THERE
 WOULD BE APPROXIMATELY ELEVEN MILLION DOLLARS IN LOSS
 TO BE TAKEN FROM THE PATENTED RUBBER CLAIMS.

Slide 3

Yankee Fork Dredging: The Forest Service uses an additional
 landscape classification called "problem landscape," which is
 self-explanatory. Although this is found on a tributary, an
 area such as this might be classified as a problem landscape.
 A decision would have to be made as to whether the historical
 significance of the site outweighs the aesthetic potential.



Slide #4

Salmon River near Clayton: Although it lacks a terminus feature object, this slide shows a good example of a focal landscape. This was taken in zone 2, a semi-closed to closed zone.



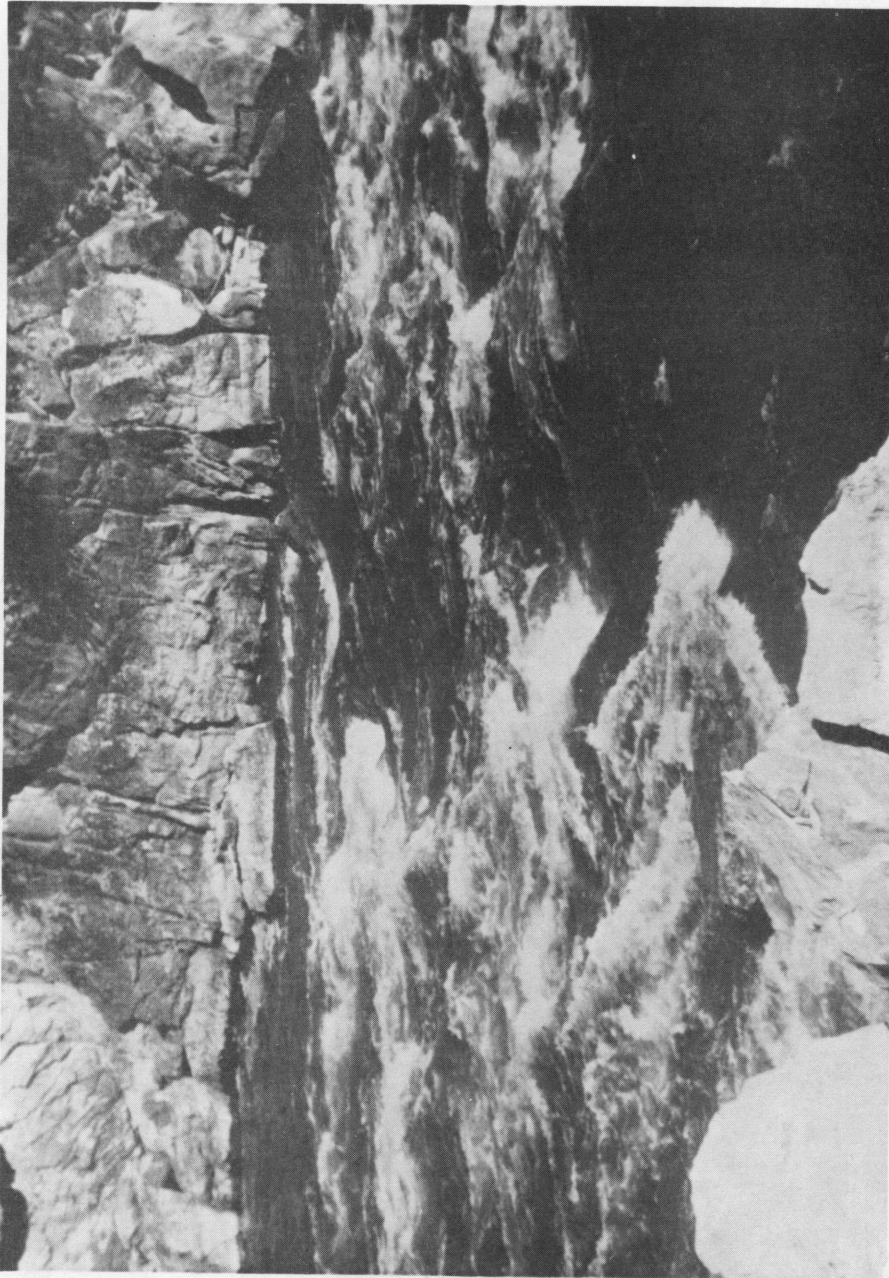
Slide #5

Salmon River Valley North of Challis: Although it could be argued, a panoramic landscape comes closest to classifying this landscape. Taken in zone 3, open.



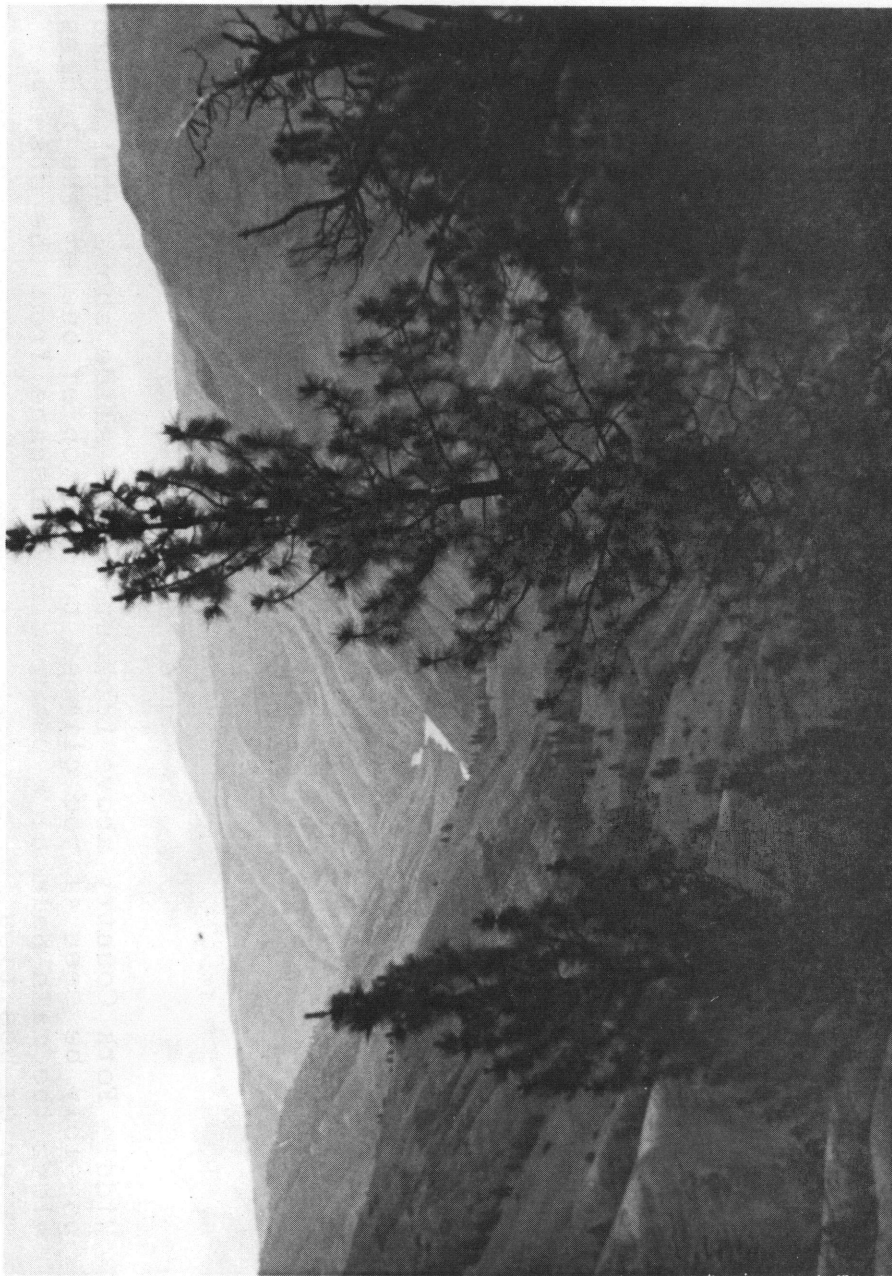
Slide #6

Mountains to East of Salmon City: A panoramic landscape found in zone 3, open.



Slide #7

Pine Creek Rapids: Note that the valley is closed here. It will stay closed to various degrees all the way to the mouth of the river. Thus zone 6, closed, will most likely be devoid of any panoramic landscapes.



Slide #8

Middle Fork Country: This slide exemplifies very well three elements used in analyzing the landscape not heretofore mentioned. These elements are foreground, middleground, and background. This slide was taken near the Middle Fork Peak Lookout.



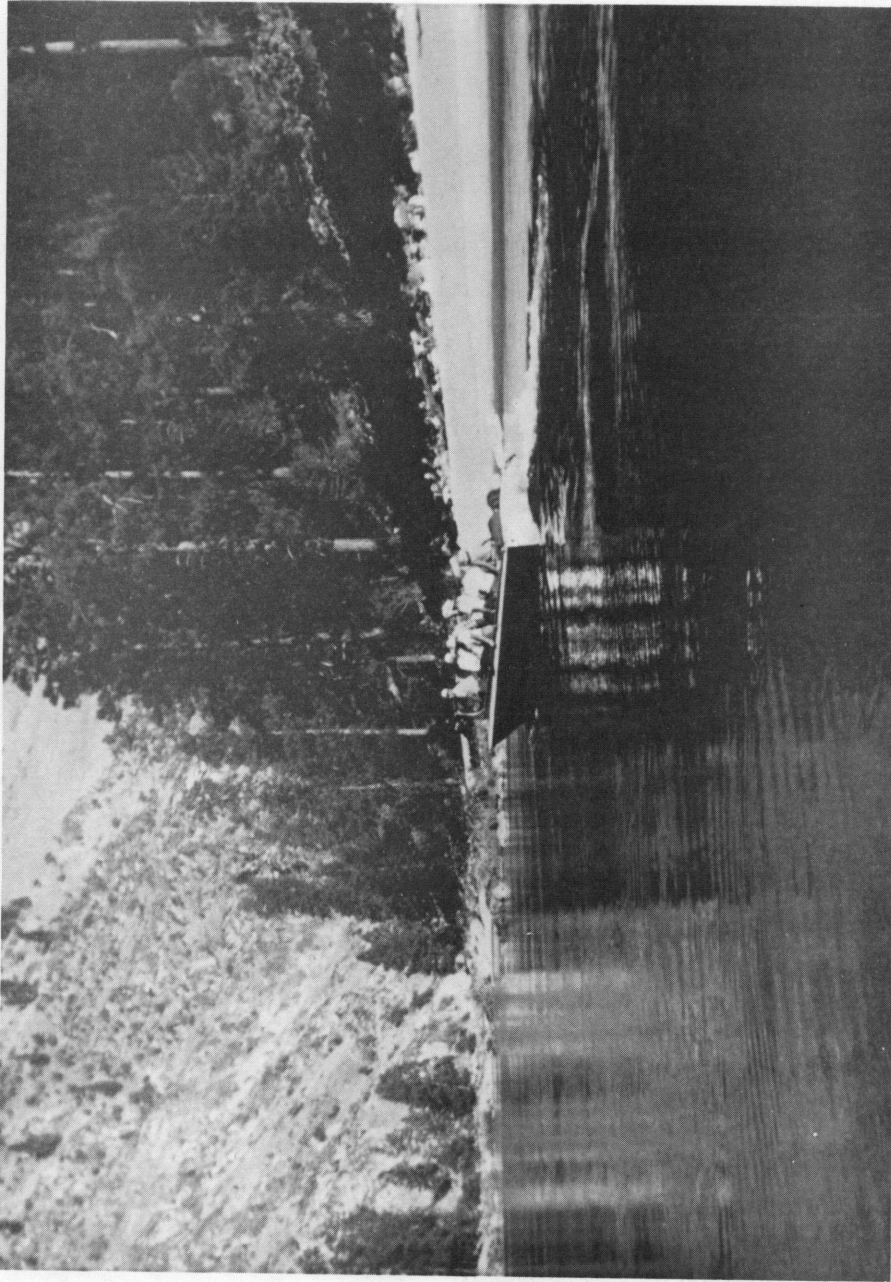
Slide #9

Middle Fork Country above Lookout: This slide shows what could possibly be seen if you climbed to the top of one of the ridges along the main Salmon; a panoramic landscape from the observer superior position.



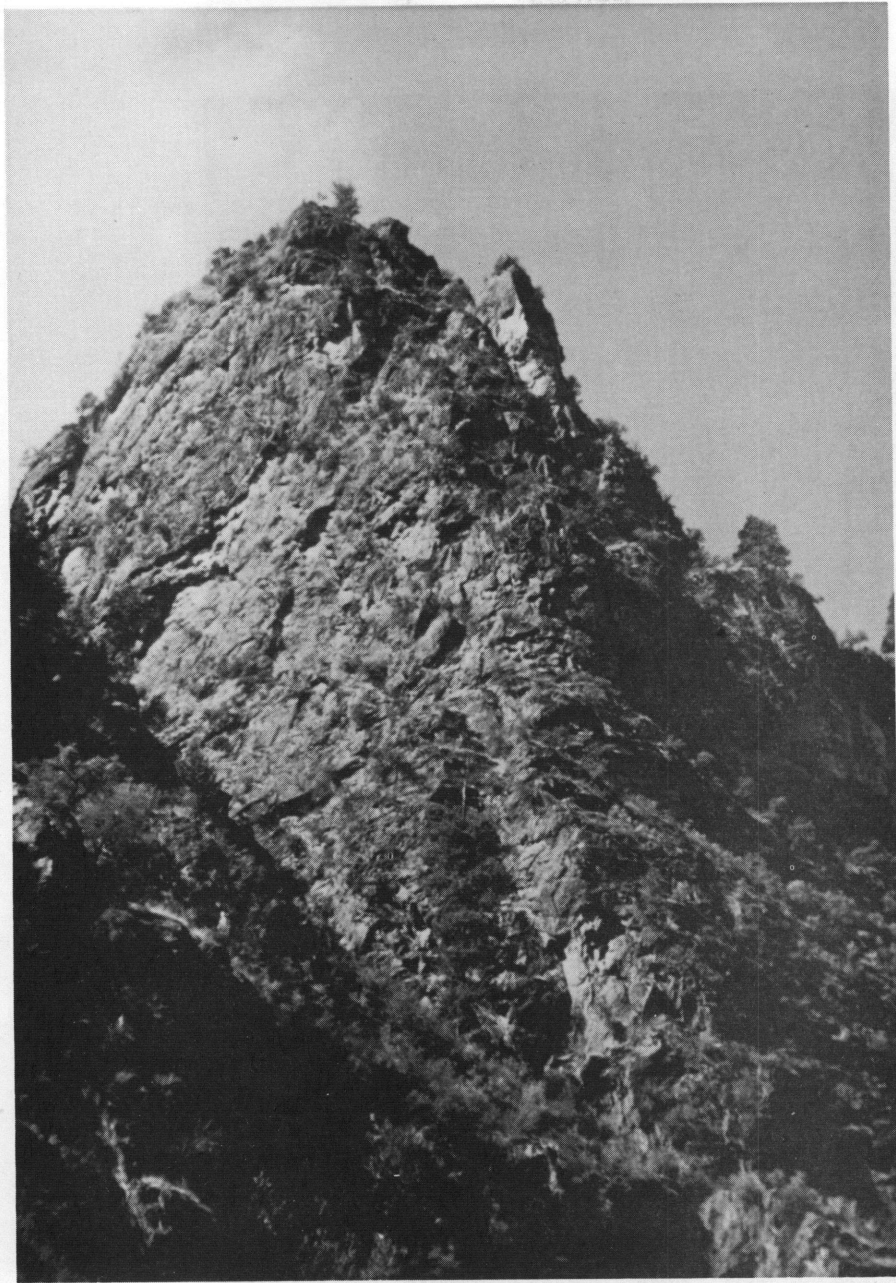
Slide #10

Crossing to Salmon River Lodge: Even though it lacks a terminus feature object, this landscape has some elements which tend to make it a focal landscape. Note how the water's edge on either side of the picture tends to draw your sight to the center of the picture. Note also the taller trees on the outside and the shorter ones to the center, producing the same effect.



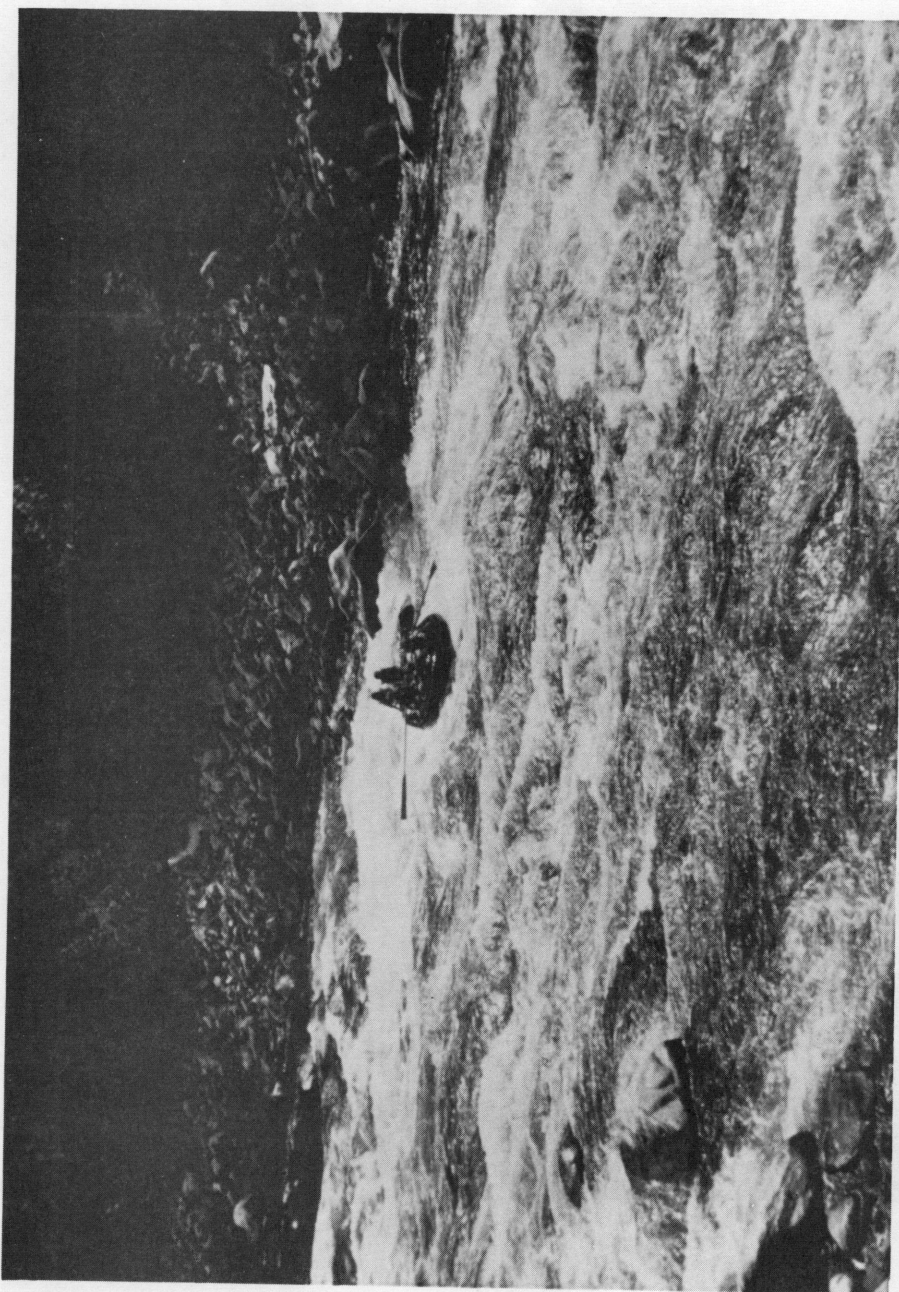
Slide #11

Below Salmon River Lodge: Going by just what the slide shows, this could be called an enclosed landscape. The area seems to be walled in or enclosed, much like a basin.



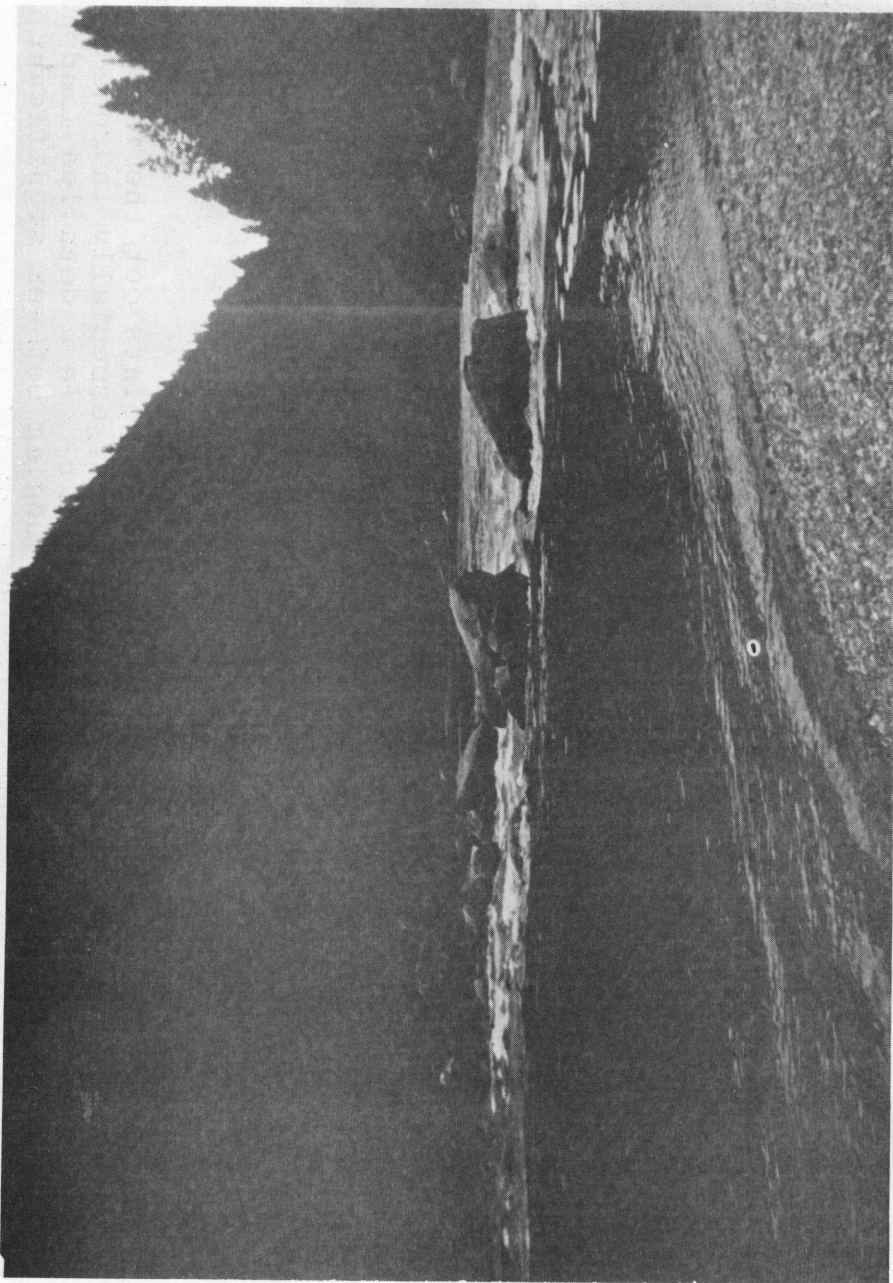
Slide #12

Indian Head: A feature landscape



Slide #13

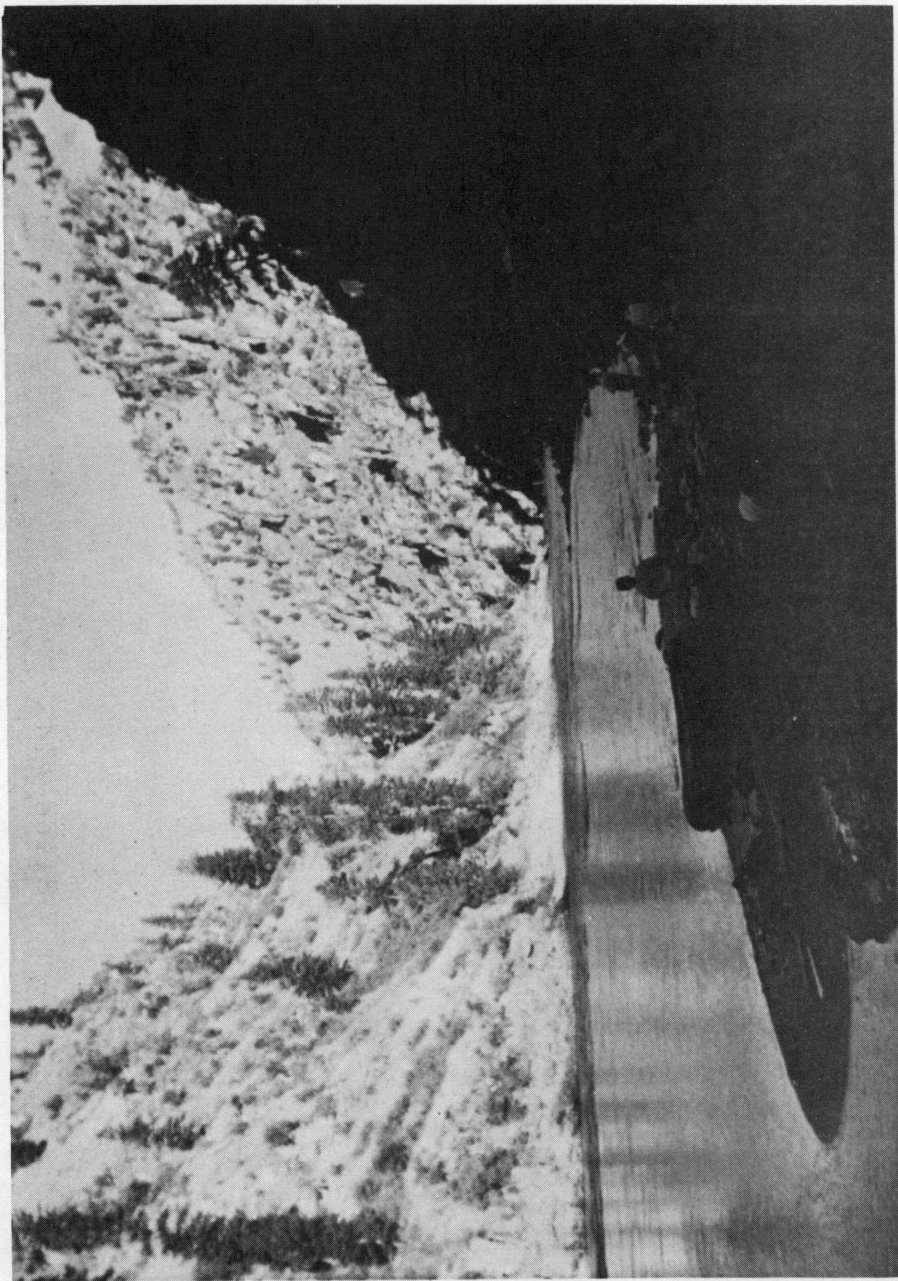
Big Mallard Rapids: The many rapids along the Salmon in this zone could conceivably be classified as feature landscapes in the sense that they are distinct features of the river and are part of what make the entire river in zone 6 unique.



Slide #14

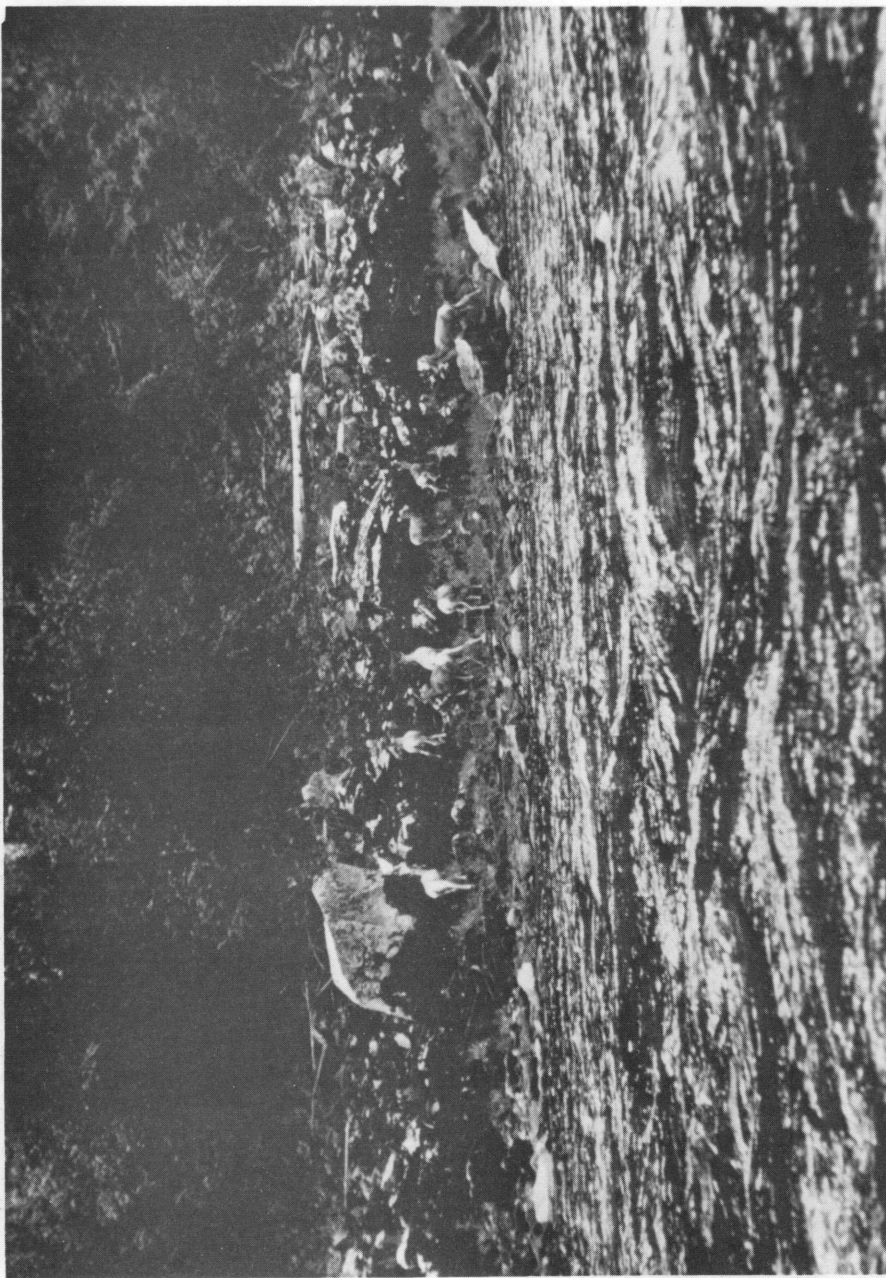
Devils Tooth Rapids: A feature landscape. No doubt this becomes a much more distinct feature in the winter.

в широкое русло, впадает в реку. В этом месте река становится



Slide #15

Downstream from South Fork: This slide points out the fact that there may be many focal landscapes, especially in zone 6, which focalize on nothing in particular. In a detailed landscape inventory, one might find himself judging between significant and insignificant focal landscapes.



Slide #16

Mountain Sheep below confluence with South Fork: Once again, wildlife creating an ephemeral landscape.



Slide #17

Salmon River Canyon from above White Bird: A panoramice landscape from an observer superior position.



Slide #18

From the top of White Bird Hill: Another good example of foreground, middle ground, and background.



Slide #19

Salmon River Canyon from above White Bird, Idaho: A panoramic landscape. It is near this area that the Salmon partially "opens up" again before closing and converging with the Snake River.

values. Two types of questionnaires were used to develop this ranked ordering, and a series of color slides was developed which was shown to the same groups several times to determine the consistency of their reactions. The results of this exercise were less than gratifying, but the insights into aesthetic perception were interesting.

The first attempt to rank aesthetics was based on comparing two slides of contrasting scenes taken along the Salmon River or other rivers, or of river scenes contrasted to other types of typical scenery such as lakes or other open country scenes of mountainous areas. A set of forms was developed for each set of slides which specifically included an evaluation of color, texture, form, and line. A second page was also included which contained a series of questions relating to: (1) which slide a person preferred; (2) did either the preferred slide or the unpreferred slide relate to a past experience; (3) did these memories influence your preference; and (4) what input did photographic technique have on your preference?

An instruction sheet was provided which defined terms and indicated the procedure to be followed in filling out the forms on the other two pages. An arbitrary ranking was used for each item in the scale and for the questions on how a person ranked his slides. An example of these forms is set forth in Exhibit 1.

The first questionnaire was shown to a select group of people who had experience on wild and scenic rivers and could thereby relate the scenes shown to their experiences on these rivers. This was done deliberately in order to attempt to develop a questionnaire which could be used on the public at large. The purpose was to determine

whether a procedure could be developed which would allow the use of the slide technique by other groups of individuals which did not have the same qualifications.

An evaluation made by Mr. Wendel Johnson, who helped in developing this procedure is included for the purpose of providing a perspective for this procedure of evaluating aesthetics.

The following page shows how many times each of the respective words was used with an extreme rating ("1" or "5"). Each check represents one extreme rating using that word. The numbers in the boxes to the far left of the page indicate how many times that word pair was used with an extreme rating.

As you can see, the "natural-unnatural" work pair under all four categories got the most use or highest number of extreme ratings. However, there was some debate during the slide show as to whether or not this word pair should be used under some of the categories, so this point needs further consideration.

Other than the "natural-unnatural" word pair, the three most frequent word pairs under each category are as follows:

COLOR

Sameness-Contrast
Bright-Dull
Appealing-Ordinary

TEXTURE

Rough-Smooth
Soft-Hard
Contrast-Sameness

FORM

Massive-Light
Distinct-Vague
Sameness-Contrast
Angular-Rounded

LINE

Curved-Angular
Continuous-Choppy
Distinct-Vague

AESTHETIC QUESTIONNAIRE I

Instructions

You will be shown two slides simultaneously. This will be slide pair 1. The slide on the left will be slide A and the slide on the right will be slide B.

On your first page you will see four categories; color, texture, form, and line. Under these categories are lists of words opposed in meaning with a five-point scale between the opposing words. You are asked to consider one slide and rate it on the scale, putting your rating number in the appropriate slide pair number box. The boxes on the left side of the page will be for ratings of slide A and the boxes on the right for ratings of slide B.

Example:

Slide A of slide pair 2 has an extreme amount on contrast of color. You would then go to the boxes on the left side of the page (under slide A) adjacent to the "sameness-contrast" scale. In the box under the number 2 (slide pair 2), you would put a number 5, since contrast is at the "5" end of the scale.

On this first page you may go through all four categories rating first slide A and then go back and do slide B, or you may rate them simultaneously. However, this page is not meant for comparison of slides, so consider each slide separately from the other.

Still on slide pair 1, go on to the second page and make the preference asked for, putting your response in the appropriate slide pair number box. Then go on and answer the questions asked; only this time merely putting a check in the appropriate box. Now go on to slide pair 2.

EXHIBIT 1

page 1 of 3

Which slide do you prefer: A or B?

1	2	3	4	5	6	7	8	9	10

Did either the preferred slide or the unpreferred slide relate to memories of an experience in the past?

	1	2	3	4	5	6	7	8	9	10
Yes										
No										

Did this influence your preference?

	1	2	3	4	5	6	7	8	9	10
Yes										
No										

Did the photographic technique influence your preference?

	1	2	3	4	5	6	7	8	9	10
Yes										
No										

EXHIBIT 1

page 2 of 3

SLIDE A										COLOR					SLIDE B										
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	1	2	3	4	5	6	7	8	9	10	
3										/ Sameness		2	3	4	5	Contrast //									
5										//// Natural						Unnatural									
1										/ Discord						Harmony									
3										/// Bright						Dull									
4										//// Appealing						Ordinary /									

										TEXTURE															
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	1	2	3	4	5	6	7	8	9	10	
2										// Rough						Smooth									
2										// Soft						Hard									
2										// Contrast						Sameness									
1										/ Coarse						Fine									
5										//// Natural						Unnatural									

										FORM															
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	1	2	3	4	5	6	7	8	9	10	
5										/ Massive						Light ///									
3										Sameness						Contrast ///									
3										/// Angular						Pounded									
4										/ Vertical						Horizontal									
5										//// Distinct						Vague									
5										//// Natural						Unnatural									

										LINE															
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	1	2	3	4	5	6	7	8	9	10	
5										/ Curved						Angular ///									
5										Unnatural						Natural ////									
4										// Continuous						Chopped //									
4										//// Distinct						Vague									

EXHIBIT 1

page 3 of 3

It should be recognized that although these are qualities of the picture the respondent preferred, they are not necessarily the qualities which made the respondent prefer the picture. All we have done so far is to establish the fact that these are qualities of a preferred landscape; they are not necessarily the reasons the landscape was preferred in the first place.

One major problem in this questionnaire is the fact that you are limiting the respondent entirely to a given set of terms; and many times these are terms which he does not understand. Although "fine texture" may be the reason a respondent likes a scene, how can he tell you this when he doesn't know what texture is; or indeed, does not even realize that texture is the quality which stimulates him to like the scene?

Although color is fairly easy to understand; line, form, and texture are concepts in themselves which only seem to become more complex if you try to explain them. Unless you are very careful in defining these terms, it is very hard to keep from limiting people in what can actually be seen in line, form, and texture.

Another weakness is that we are limiting ourselves too much to these four elements; color, form, line, and texture. No doubt these are important, but there are other factors such as lighting, distance of view, and perhaps perspective which may contribute to an aesthetic scene.

One of the reasons behind this last type of questionnaire used was to be able to give the respondent as broad a range of factors as possible to choose from which could actually be seen in a slide.

I still believe a good approach is to list all those factors of a scene which could possibly contribute to its aesthetic appeal. One thing this questionnaire has shown is that we should stay away from value laden words such as discord and harmony. Discord naturally has a negative connotation and harmony the opposite.

What makes harmony in a scene? The ways the trees are grouped, the way the water ripples, the way the mountains meet the river? Maybe it is these factors we should list for the respondent to choose from and then let ourselves decide if that particular tree grouping is harmonious or not. In this way we might get around terms which people don't understand.

The following pages give lists of words used in rating those slides preferred by the respondents. I have shown the slide pair number, the questionnaire number, the slide which the respondent preferred, and the words which he used to rate or describe the slide. Directly adjacent to the word is the rating number given by the respondent. The numbers "1" and "5" indicate a strong response and the numbers "2" and "4" indicate a not-so-strong or medium response. The number "3" was considered to mean neutral or no response and was not included in the list. An example of the slide pairs are shown in Figures 6 and 7.

SLIDE PAIR #1

QUESTIONNAIRE #1 - PREFERENCE: SLIDE A

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Natural-1	Smooth-4	Massive-2	Natural-5
Harmony-5	Sameness-4	Contrast-4	Continuous-1
	Natural-1	Angular-2	Distinct-1
		Distinct-1	
		Natural-1	

QUESTIONNAIRE #2 - PREFERENCE: SLIDE A

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Contrast-4	Contrast-1	Massive-2	Angular-5
Natural-1	Natural-1	Contrast-4	Natural-4
Harmony-4		Angular-1	Continuous-2
Appealing-1		Distinct-2	Distinct-1
		Natural-1	

QUESTIONNAIRE #3 - PREFERENCE: SLIDE A

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Natural-1	Contrast-2	Massive-2	Distinct-2
Harmony-5	Coarse-2	Sameness-2	
Bright-2	Natural-1	Angular-2	
		Vertical-2	
		Distinct-1	
		Natural-1	

QUESTIONNAIRE #4 - PREFERENCE: SLIDE A

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Contrast-5	Rough-1	Contrast-5	Natural-5
Natural-1	Fine-4	Angular-1	Choppy-5
Harmony-4	Natural-1	Vertical-2	Distinct-1
Bright-1		Distinct-1	
Appealing-1		Natural-1	

SLIDE PAIR #2

QUESTIONNAIRE #1 - PREFERENCE: SLIDE A

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Sameness-2	Smooth-4	Sameness-2	Continuous-2
Natural-2	Sameness-4	Rounded-4	
Dull-4	Natural-1	Vague-4	
Ordinary-4			

QUESTIONNAIRE #2 - PREFERENCE: SLIDE A

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Unnatural-4	Smooth-4	Massive-2	Angular-5
Dull-4	Soft-2	Contrast-4	Natural-4
Ordinary-4	Sameness-4	Angular-1	Continuous-2
	Coarse-2	Distinct-2	Distinct-1
	Natural-1	Natural-1	

QUESTIONNAIRE #3 - PREFERENCE: SLIDE B

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Contrast-4	Soft-2	Massive-2	Natural-4
Unnatural-4	Contrast-2	Contrast-4	Vague-4
Discord-2	Unnatural-4	Vertical-2	
Bright-2		Unnatural-4	
Ordinary-4			

QUESTIONNAIRE #4 - PREFERENCE: SLIDE A

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Contrast-4	Rough-1	Contrast-5	Curved-2
Natural-1	Hard-4	Angular-1	Natural-5
	Sameness-4	Vertical-2	Choppy-5
	Coarse-2	Distinct-1	Distinct-1
	Natural-1	Natural-1	

SLIDE PAIR #3

QUESTIONNAIRE #1 - PREFERENCE: SLIDE A

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Sameness-2	Natural-2	Distinct-2	Natural-4
Natural-2		Natural-2	Continuous-2
Harmony-4			Distinct-2
Bright-2			
Appealing-2			

QUESTIONNAIRE #2 - PREFERENCE: SLIDE B

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Contrast-4	Rough-2	Angular-2	Angular-4
Discord-2	Hard-4		Vague-4
Bright-1	Coarse-2		
Appealing-2			

QUESTIONNAIRE #3 - PREFERENCE: SLIDE B

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Natural-2	Rough-2	Massive-2	Angular-4
	Sameness-4	Natural-2	

QUESTIONNAIRE #4 - PREFERENCE: SLIDE B

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Contrast-5	Rough-2	Light-5	Curved-2
Natural-1	Soft-1	Contrast-5	Natural-5
Harmony-4	Coarse-2	Rounded-4	Continuous-2
Dull-4	Natural-2	Horizontal-4	Distinct-1
Appealing-1		Distinct-1	
		Natural-1	

SLIDE PAIR #4

QUESTIONNAIRE #1 - PREFERENCE: SLIDE A

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Contrast-4	Contrast-2	Contrast-4	Natural-4
Natural-2	Natural-2	Rounded-4	Continuous-2
Ordinary-4			Distinct-2

QUESTIONNAIRE #2 - PREFERENCE: SLIDE A

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Contrast-4	Smooth-4	Light-4	Curved-1
Natural-1	Contrast-2	Contrast-4	Natural-4
Harmony-4	Fine-4	Rounded-4	Continuous-1
Bright-2	Natural-1	Distinct-2	Distinct-2
Appealing-2		Natural-2	

QUESTIONNAIRE #3 - PREFERENCE: SLIDE A

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Sameness-2	None	Horizontal-4	Choppy-4
Natural-2		Distinct-2	Distinct-2
Harmony-4		Natural-2	
Bright-2			
Ordinary-4			

QUESTIONNAIRE #4 - PREFERENCE: SLIDE A

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Contrast-4	Smooth-4	Light-5	Angular-4
Harmony-4	Hard-4	Contrast-4	Unnatural-2
Ordinary-5	Sameness-4	Angular-2	Choppy-4
	Fine-4	Vertical-2	Distinct-2
	Natural-2	Distinct-2	
		Natural-2	

SLIDE PAIR #5

QUESTIONNAIRE #1 - PREFERENCE: SLIDE A

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Sameness-1	Rough-2	Massive-1	Angular-4
Natural-1	Hard-4	Sameness-2	Natural-4
Harmony-4	Contrast-2	Angular-1	
Appealing-2	Coarse-2	Vertical-1	
	Natural-2	Distinct-1	
		Natural-1	

QUESTIONNAIRE #2 - PREFERENCE: SLIDE A

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Sameness-2	Hard-4	Massive-1	Angular-5
Unnatural-4	Contrast-2	Sameness-1	Natural-5
Harmony-4	Fine-4	Angular-1	Choppy-4
Bright-2	Natural-1	Vertical-2	
Appealing-2		Distinct-1	
		Natural-2	

QUESTIONNAIRE #3 - PREFERENCE: SLIDE A

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Sameness-2	Rough-2	Light-5	Angular-4
Natural-2	Hard-4	Contrast-4	Natural-4
Harmony-4	Contrast-2	Horizontal-4	Distinct-2
Bright-2	Coarse-1	Distinct-1	
Appealing-2	Unnatural-5	Natural-1	

QUESTIONNAIRE #4 - PREFERENCE: SLIDE B

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Contrast-5	Rough-2	Light-5	Angular-4
Natural-1	Soft-1	Contrast-4	Natural-5
Harmony-4	Contrast-1	Angular-2	Choppy-4
Bright-1	Fine-4	Distinct-1	Distinct-1
Appealing-1	Natural-1	Natural-1	

The following page lists only those words used with the most extreme ratings in describing preferred slides. The number in the circle adjacent to the word indicates how many times that word is used with an extreme rating.

NOTE: All of the following words deal only with the preferred slides of each slide pair.

Words with the most extreme ratings used to describe slide A of slide pair 1:

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Natural (4)	Natural (4)	Distinct (3)	Natural (2)
Harmony (2)	Contrast (1)	Natural (4)	Continuous (1)
Appealing (2)	Rough (1)	Angular (2)	Distinct (3)
Bright (1)		Contrast (1)	Angular (1)
			Choppy (1)

NOTE: Parenthesized number after the word refers to how many times the word was used with an extreme rating. For instance, "natural" under "color" has a 4 after it, which means that all four respondents felt that the color in this slide was very natural.

Words with most extreme ratings used to describe slide A of slide pair 2.

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Natural (1)	Natural (3) Rough (1)	Angular (2) Natural (2) Contrast (1) Distinct (1)	Angular (1) Distinct (2) Natural (1) Choppy (1)

Words with most extreme ratings used to describe slide B of slide pair 2.

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
None	None	None	None

NOTE: This person preferred slide B, but gave no extreme ratings for either A or B.

Words with most extreme ratings used to describe slide A of slide pair 3.

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
None	None	None	None

Words with most extreme ratings used to describe slide B of slide pair 3.

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Bright (1) Contrast (1) Appealing (1)	Soft (1)	Light (1) Distinct (1) Natural (1) Contrast (1)	Natural (1) Distinct (1)

Words with most extreme ratings used to describe slide A of slide pair 4.

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Natural (1) Ordinary (1)	Natural (1)	Light (1)	Curved (1) Continuous (1)

Words with most extreme ratings used to describe slide A of slide pair 5.

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Sameness (1)	Natural (1)	Massive (2)	Angular (1)
Natural (1)	Coarse (1)	Angular (2)	Natural (1)
		Vertical (1)	
		Distinct (3)	
		Natural (2)	
		Light (1)	

Words with most extreme ratings used to describe slide B of slide pair 5.

<u>COLOR</u>	<u>TEXTURE</u>	<u>FORM</u>	<u>LINE</u>
Appealing (1)	Soft (1)	Light (1)	Natural (1)
Contrast (1)	Contrast (1)	Distinct (1)	Distinct (1)
Natural (1)	Natural (1)	Natural (1)	
Bright (1)			

The following page gives the results of the slide preference question and the other questions on the back page. The "relation to past experiences", "influence on preference", and "photographic technique" tabulations do not show questionnaire numbers because I only wanted to see if there was any influence from these factors. I was not interested in who they influenced.



FIGURE 6

Slide pair, slide no. 1



FIGURE 7

Slide pair, slide no. 2

SLIDE PREFERENCES

		Slide Pairs				
		1	2	3	4	5
Slide A		4	3	1	4	3
Slide B		0	1	3	0	1

RELATION TO PAST EXPERIENCE

		Questionnaire No.				
		1	2	3	4	
YES		3	2	5	2	12 = Total of Yes's
NO		5	4	2	3	8 = Total of No's

INFLUENCE ON PREFERENCE

		Questionnaire No.				
		1	2	3	4	
YES		0	1	3	2	6 = Total of Yes's
NO		5	4	2	3	14 = Total of No's

PHOTOGRAPHIC TECHNIQUE

		Questionnaire No.				
		1	2	3	4	
YES		1	2	2	4	9 = Total of Yes's
NO		4	3	3	1	11 = Total of No's

The conclusions drawn from this first approach to evaluating aesthetics were that it was too complex for use by the general public. The terms used to describe aesthetic qualities were not well understood by the participants. As a result, the evaluations tended to be contradictory both within and among individuals' choices or preferences for the slides shown. There was some consistency in selecting slides which were preferred, but it was not possible to determine specifically why they were selected based on the criteria set forth in the forms.

Based on the first attempt at quantifying aesthetic preferences, a second attempt was made which utilized the information obtained in the first attempt. In this case it was determined that we should go to a broader public, and that we should try to let this public define what it thought was important in determining aesthetic value in their own terms. Another difference was that a series of three slides were shown instead of two. The purpose here was to provide additional contrast which made the choice in some ways more difficult and in other ways clearer. A sample instruction sheet and questionnaire are shown in Exhibit 2. An example of a slide triplet is shown in Figures 8, 9, and 10. These questionnaires and slides were shown several times (4) to classes on the University of Idaho Campus. The results were again not very gratifying in that it was not possible to discern any direction or ranking of the collective responses. The respondents tended to become confused over the triple slide approach and would seemingly mentally flip a three sided coin as their choice criterion. They were unable to indicate specifically why they pre-

ferred a given scene, or even generally indicate why they liked a scene.

One or two items stood out among the many concerning their preferences. If a slide had a feature such as an animal, jet or float boat, people, or buildings they either did or did not prefer it. In addition, photographic technique seemed to be very important in affecting individuals' preferences for various scenes.

In conclusion, this approach to aesthetics was dropped because it was determined not to be very productive in light of the objectives of the project which were directed toward some means of quantifying aesthetic responses to wild and scenic rivers. Secondly, the effort was not entirely in vain because it pointed out very clearly that aesthetics is very complex and personal. These implications were followed up by additional research which follows in this report.

Quantification of Aesthetics

The major objective of this research was to develop criteria for measuring how wild river users and recreationists respond to the environs of the river. The complexity of evaluating the wild river experience required the use of several methods, some of which were described earlier in this report. These earlier attempts concentrated on descriptive procedures to evaluate aesthetics and they did not come up with a cardinal ordering, which was desired.

The first problem is to use the word aesthetics in such a way that it means the same thing each time it is used. In this report, aesthetics is defined as the river runner's perception of beauty as it is seen on or near the river. This refers to the beauty of the

AESTHETIC QUESTIONNAIRE II

The purpose of this questionnaire is to determine the factors involved in landscape preferences. Through this questionnaire we hope to discover some common factors which people feel contribute to an appealing landscape.

You will be shown three slides simultaneously. You are asked to choose the landscape scene which is most appealing to you and then state your reasons for why you believe it is appealing. Please feel free to write down any factors which you feel influenced your preference.

You will have three minutes for each slide triplet shown. After all the slide triplets have been shown, choose the one landscape scene which most appeals to you from those which you have already chosen. Sorry, but the time available does not permit a reviewing of the slides for this last choice.

I. I prefer landscape scene _____ because:

II. I prefer landscape scene _____ because:

III. I prefer landscape scene _____ because:

IV. I prefer landscape scene _____ from those chosen above. (Indicate by writing in numeral next to preferred scene; I, II, or III).



FIGURE 8
Slide Triplet No. 1

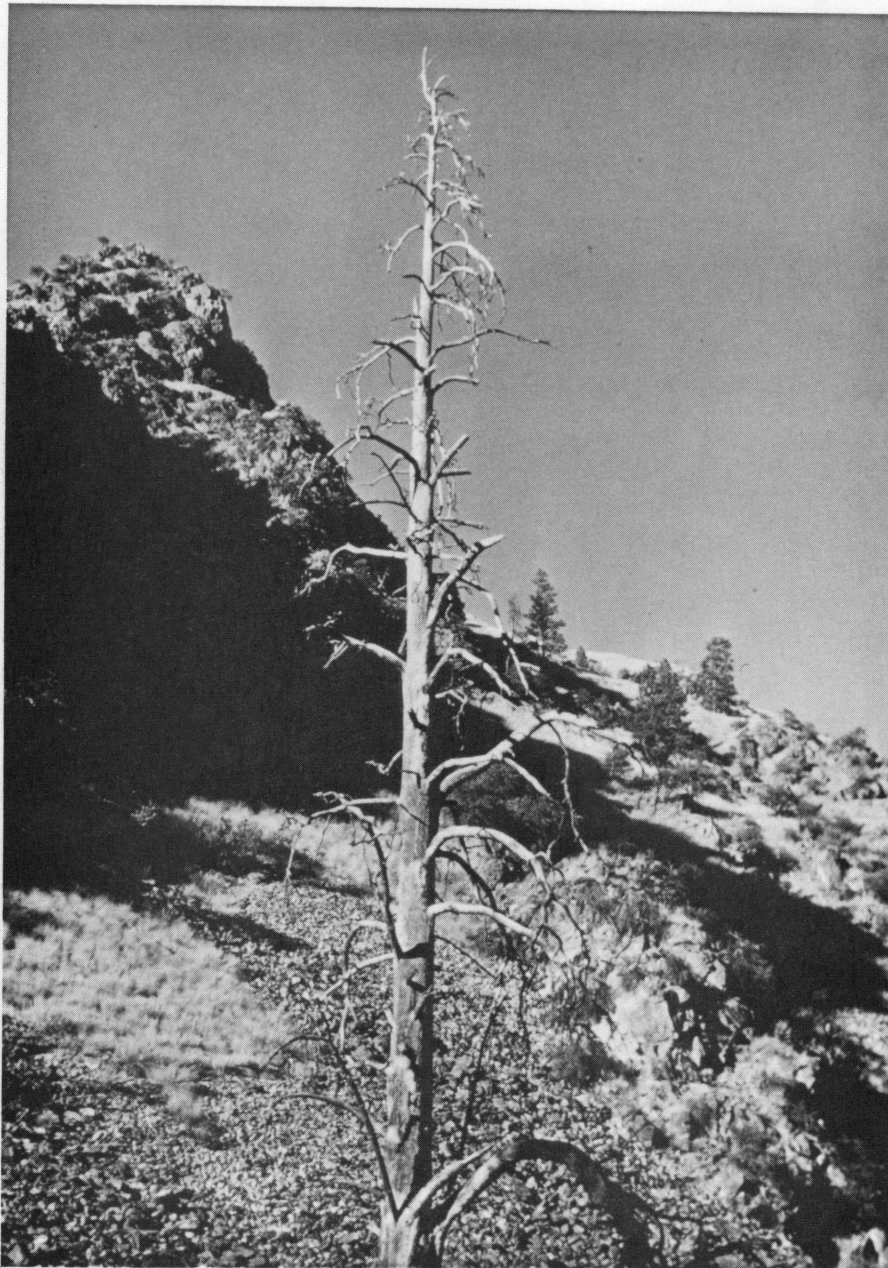


FIGURE 9
Slide Triplet No. 2



FIGURE 10

Slide Triplet No. 3

immediate environment as seen from moving water and/or the river bank. Obviously, the scene changes as one moves on the surface of a river, and therefore, aesthetic perception changes as one moves downstream. This implies that aesthetics is dynamic and changes as the river scenes change. Any attempt to develop a single valued function to describe aesthetics is not likely to be completely successful because no one number clearly defines aesthetic perception. For this reason the numbers used in the remainder of this report should be thought of as indexes of aesthetic values.

Relationship Between Aesthetics and Outdoor Recreation

In this study it was perceived that a strong relationship exists between the outdoor recreation activities associated with wild and scenic rivers and aesthetic appreciation. The reasons why people enjoy wild and scenic rivers can be assumed to be related to the things they do while on the rivers or in the river areas. This relationship was used in this study based on the assumption that part of the reason why people recreate is the appreciation of aesthetics, which comes as a result of the outdoor recreation activities which they engage in. This assumption implies that aesthetics, as a reason for recreating, is at least as important as floating, fishing, camping, hiking, and/or other reasons why people recreate on wild and scenic rivers.

The data used in this study covered three areas on the Salmon River based on a survey done in 1969; and data on the Middle Fork Salmon River based on a survey done in 1969; and surveys done in 1971 on the St. Joe River and in the Stanley Basin on the Upper

Salmon River. These three rivers were used to provide a basis for comparison of the results of the technique described herein. The results are evaluated among river areas. The purpose was to determine the consistency of the technique among areas.

The method used to quantify aesthetic values was to develop demand models for outdoor recreation in the various river areas to provide the basis for valuing aesthetics. These demand models estimated the number of visitor days which would be consumed at various costs per visitor day. A visitor day was defined as any portion of a 12 hour period spent recreating in the out of doors. It was from this source that all the values discussed in this report were derived. These values relate back to the previous discussion which indicated that the aesthetic values derived herein were related to the value of whole outdoor recreation experience. In other words, the value of aesthetics is part of the value of outdoor recreation, and our efforts are directed toward finding a way to allocate value to the aesthetic portion of the experience. The way chosen was to determine the amount of consumer surplus involved in the outdoor recreation experience, and then to estimate how much of it was related to aesthetics.

Consumer surplus in economic terminology is defined as the difference between total utility and the total market value of a good or service. The difference is a surplus of utility which a consumer(s) receives because they get more than they pay for. This occurs because each unit of a good or service which a consumer buys, costs only as much as the last unit is worth. And according to the law of dimin-

ishing marginal utility, the previously purchased units are worth more than those purchased more recently. Thus he obtains a surplus on each of the earlier units purchased. A graphic example is shown in figure 11. At a price p_1 the total cost (TC) is the area included in OABC, and the consumer surplus is the area included in ALB for the quantity q_1 . At the price of p_2 the total cost is the area ODEF and the consumer surplus is the area DLE for the quantity q_2 . The gain in utility is represented by the area DABE. At price p_3 the total cost is the area OGHK and the consumer surplus is the area GLH for the quantity q_3 . The gain in utility is the area GDEH.

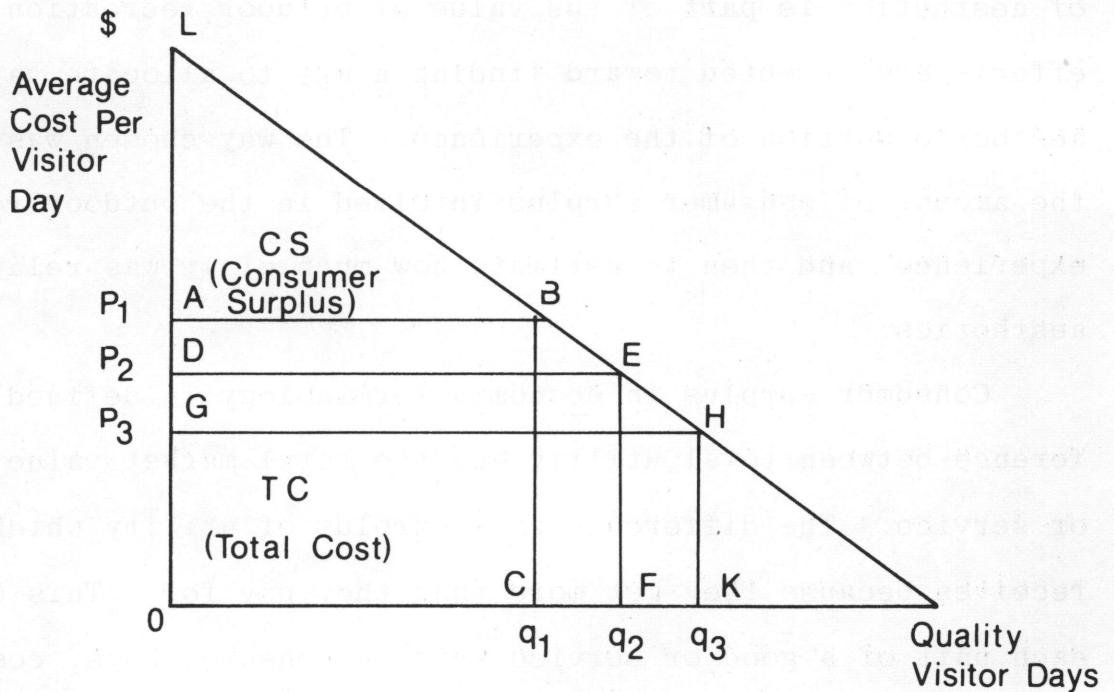


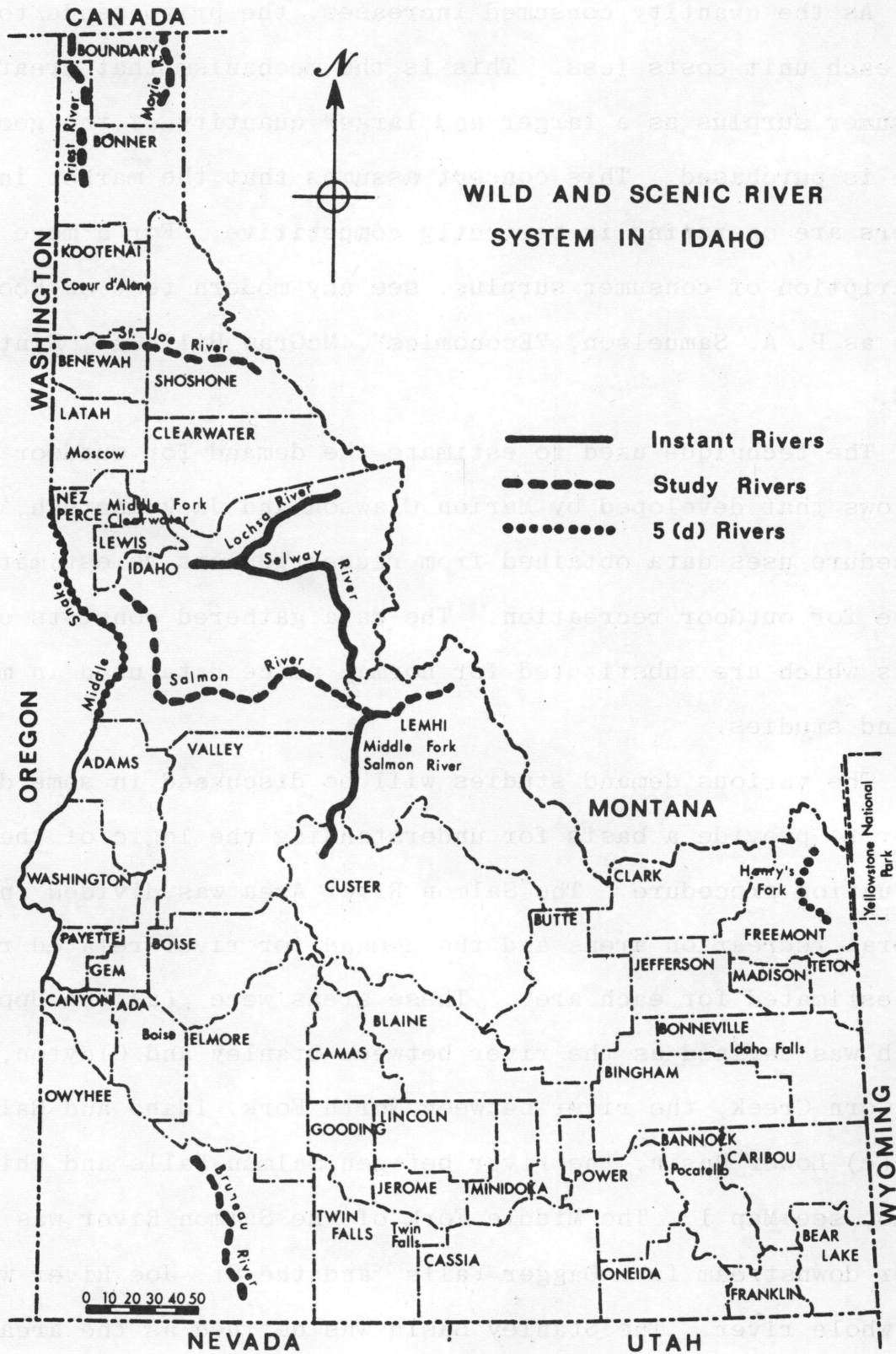
Figure 11

Hypothetical demand curve for recreation

As the quantity consumed increases, the price tends to fall, and each unit costs less. This is the mechanism that creates the consumer surplus as a larger and larger quantity of the good or service is purchased. This concept assumes that the market in which consumers are operating is perfectly competitive. For a more detailed description of consumer surplus, see any modern text on Economics, such as P. A. Samuelson, "Economics", McGraw Hill Co., Ninth edition 1973.

The technique used to estimate the demand for outdoor recreation follows that developed by Marion Clawson and Jack Knetsch.⁷ This procedure uses data obtained from recreationists to estimate a demand curve for outdoor recreation. The data gathered consists of user costs which are substituted for normal price data used in market demand studies.

The various demand studies will be discussed in some detail in order to provide a basis for understanding the logic of the aesthetic evaluation procedure. The Salmon River Area was divided into three general recreation areas and the demand for river related recreation was estimated for each area. These areas were: (a) the Upper Basin, which was defined as the river between Stanley and Clayton, Idaho; (b) Corn Creek, the river between North Fork, Idaho and Salmon Falls; and (c) Lower Basin, the river between Salmon Falls and White Bird, Idaho, see Map 1. The Middle Fork of the Salmon River was the whole river downstream from Dagger Falls, and the St. Joe River was again the whole river. The Stanley Basin was defined as the area above Stanley upstream to the Galena Summit area.



Wild and scenic river system in Idaho

The demand equations used in this study are shown in linear form in Table 1, and in exponential form in Table 2. The graphs of these curves are shown in Appendix 1. Each table includes the various demand equations, the standard errors of estimated parameter for each independent variable, and identification of each variable. The statistics of fit for all the equations are shown in Table 3, which is divided into two parts, (1) the linear form equations and (2) the log form equations. The statistics reported were the multiple coefficient of correlation, the multiple coefficient of determination, the overall F ratio for each equation, the date the data were obtained, the size of sample, and the area of the state.

In looking at these equations and comparing one form with another, one thing stands out. The log form equations tend to have higher multiple correlation and multiple coefficient of determination values and F ratios for the overall goodness of fit.

For the purposes of this study, the author had decided to use the linear form. The reason was related to the use of dummy variables which are variables which are assigned a value based on how individuals ranked their experiences. These values become nonsense numbers if they are transformed into logs and used to estimate experience values. So, for purposes of consistency the linear form variables will be used in the analysis.

A more detailed examination of the data in Tables 1 and 2 indicates that the equations were developed over different periods of time ranging from 1969 to 1971. The Middle Fork of the Salmon River can be evaluated to determine the consistency of the analytical

Table 1. Linear Form Statistical Demand Equations for Outdoor Recreation

I. Stanley Basin, N = 425

Date

$$\begin{aligned} \hat{Y} = & 40.5505 + 0.00056X_{1i} + 0.0499X_{2i} - 13.1362X_{3i} + 19.4988X_{4i} \\ & (0.00022) \quad (0.0272) \quad (0.9409) \quad (1.3763) \end{aligned}$$

Where \hat{Y} = number of visitor days

X_1 = total income of person responsible for covering expenses

X_2 = total annual paid vacation time for non-retired persons

X_3 = total transfer costs per visitor day

X_4 = travel time to and from recreation area

II. St. Joe River, N = 109

Date

$$\begin{aligned} \hat{Y} = & 20.425 + 0.986X_{1i} - 0.012X_{2i} + 0.345X_{3i} - 5.777X_{4i} \\ & (0.3926) \quad (0.0033) \quad (0.0321) \quad (0.5544) \end{aligned}$$

Where \hat{Y} = number of visitor days

X_1 = travel time to and from river

X_2 = miles travelled to and from river

X_3 = total cost of trip

X_4 = total transfer cost per visitor day

III. Main Salmon River Areas

Date

1969 1. Upper Basin, N = 150

$$\begin{aligned} \hat{Y} = & 18.6233 - 0.6675X_{1i} - 0.7084X_{2i} + 0.0002X_{3i} \\ & (0.17004) \quad (0.94848) \quad (0.00019) \end{aligned}$$

1969 2. Corn Creek, N = 159

$$\begin{aligned} \hat{Y} = & 19.0331 - 0.6736X_{1i} + 1.5999X_{2i} + 0.0001X_{3i} \\ & (0.13121) \quad (1.18315) \quad (0.00024) \end{aligned}$$

Table 1 (continued)

III. Main Salmon River Areas (continued)

Date

1969 3. Lower Basin, N = 304

$$\hat{Y} = 17.2797 - 0.4921X_{1i} - 1.2347X_{2i} + 0.0001X_{3i}$$

(0.07474) (0.87836) (0.00017)

Where \hat{Y} = number of visitor days

X_1 = total transfer costs per visitor day

X_2 = education level

X_3 = income level

IV. Middle Fork Salmon River, N = 218

Date

$$\hat{Y} = 12.66783 - 0.07879X_{1i} + 0.30243X_{2i} - 0.00001X_{3i}$$

(0.01625) (.17429) (0.00003)

Where \hat{Y} = number of visitor days

X_1 = total transfer cost per visitor day

X_2 = education level

X_3 = income level

Table 2. Natural Log Form Statistical Demand Equations for Outdoor Recreation

I. Stanley Basin

Date

$$1971 \hat{Y} = 3.46528 + 0.00001X_{1i} + 0.00113X_{2i} - 0.26756X_{3i} + 0.03383X_{4i}$$

(0.0000)
(0.00044)
(0.01525)
(0.02231)

Where \hat{Y} = number of visitor days

X_1 = total income of person responsible for covering expenses

X_2 = total annual paid vacation time for non-retired persons

X_3 = total transfer costs per visitor day

X_4 = travel time to and from recreation area

II. St. Joe River

Date

$$1971 \hat{Y} = 1.411 + 1.061X_{1i} + 0.525X_{2i} + 0.171X_{3i} - 0.203X_{4i}$$

(0.1280)
(0.0841)
(0.0724)
(0.0684)

Where \hat{Y} = number of visitor days

X_1 = \log_e group size

X_2 = \log_e total miles travel

X_3 = \log_e people covered by total costs

X_4 = \log_e costs per visitor day

III. Main Salmon River Areas

Date

1969 Upper Basin

$$\hat{Y} = 0.99835 - 0.29716X_{1i} - 0.0732X_{2i} + 0.14392X_{3i}$$

(0.02617)
(0.12250)
(0.09543)

$$1969 \hat{Y} = 1.12302 - 0.30086X_{1i} + 0.27690X_{2i} + 0.11021X_{3i}$$

(0.01842)
(0.10817)
(0.09268)

Table 2 (continued)

III. Main Salmon River Areas (continued)

Date

$$\begin{aligned} \underline{1969} \hat{Y} = & 1.18387 - 0.18908X_{1i} - 0.04776X_{2i} + 0.01568X_{3i} \\ & (0.00937) \quad (0.10201) \quad (0.17325) \end{aligned}$$

Where \hat{Y} = number of visitor days

X_1 = total transfer costs per visitor day

X_2 = education level

X_3 = income level

IV. Middle Fork Salmon River

Date

$$\begin{aligned} \underline{1969} \hat{Y} = & 1.16879 - 0.14455X_{1i} + 0.08993X_{2i} + 0.03694X_{3i} \\ & (0.1223) \quad (0.03579) \quad (0.2592) \end{aligned}$$

Where \hat{Y} = \log_e number of visitor days

X_1 = \log_e total transfer cost per visitor day

X_2 = \log_e education level

X_3 = \log_e income level

Table 3. Statistics of Fit for Outdoor Recreation Demand Equations

Equations	Linear Form				Log Form			
	Date	N	R	R ²	F	R	R ²	F
Stanley Basin	1971	425	0.646	0.418	75.4**	0.706	0.498	73.50**
St. Joe	1971	109	0.768	0.590	37.41**	0.805	0.648	47.82**
Upper Basin	1969	150	0.324	0.105	11.43**	0.694	0.482	45.25**
Corn Creek	1969	159	0.402	0.162	16.54**	0.808	0.653	97.15**
Lower Basin	1969	304	0.368	0.135	13.65**	0.764	0.584	140.41**
Middle Fork	1969	218	0.351	0.173	3.58**	0.641	0.412	49.87**

Table 4. Demand Schedules for Outdoor Recreation Linear Form Equations

Transfer Cost or price	Visitor Days Consumed							
	Stanley Basin	Upper Basin	Corn Creek	Lower Basin	Middle Fork	Middle Fork II	Middle Fork III	St. Joe River
	(1)	(3)	(4)	(5)	(6)	(7)	(8)	(2)
0	82.7	19.4	25.8	15.1	13.6	19.9	19.5	42.0
2	56.4	18.1	24.5	14.1	13.4	19.9	19.4	30.5
4	30.1	16.8	23.2	13.1	13.3	19.8	19.3	18.9
6	3.9	15.4	21.9	12.1	13.1	19.8	19.1	7.4
8	-22.4	14.1	20.6	11.2	12.9	19.7	19.0	-4.2
10		12.8	19.3	10.2	12.8	19.7	18.9	
12		11.4	18.0	9.2	12.6	19.6	18.8	
14		10.1	16.7	8.2	12.5	19.6	18.6	
16		8.8	15.4	7.2	12.3	19.5	18.5	
18		7.4	14.1	6.2	12.2	19.4	18.4	
20		6.1	12.8	5.2	12.0	19.4	18.2	
22		4.8	11.4	4.3	11.8	19.3	18.1	
24		3.4	10.1	3.3	11.7	19.3	18.0	
26		2.1	8.8	2.3	11.5	19.2	17.8	
28		.7	7.5	1.3	11.4	19.2	17.7	
30		-.6	6.2	.3	11.2	19.1	17.6	

procedure used to determine the demand for outdoor recreation for this river. Another factor which stands out is that the demand equations were estimated for several rivers all of which have quite different characteristics. These rivers were chosen to evaluate how well this technique will work in reflecting comparative recreation values. The Middle Fork of the Salmon River is known for its white water rafting and is unique in this respect. The Salmon River is noted for its fishing in the upper reaches including in the Stanley Basin, and also for its outstanding scenic beauty. The Corn Creek and lower basin are noted for steelhead and salmon fishing, jet boating, hunting and camping resources. The St. Joe River is a canoeing, fishing, camping and hunting river. One major purpose of this analysis will be to compare how these rivers rank in terms of aesthetic qualities as seen by recreationists.

Demand Schedules

The schedules of the prices (costs per visitor day to participate in outdoor recreation) are shown for all areas in Table 4. It is evident that costs would have to increase significantly if use were to be reduced on the Salmon River or the Middle Fork Salmon River. This relationship does not, however, hold for the Stanley Basin or the St. Joe River areas. The reasons the elasticities of demand differ for these areas is largely due to accessibility and the type of outdoor recreation available. The Salmon River and Middle Fork areas are more remote, and the activities engaged in are white water floating or jet boating, fishing and other more remote area activities. The parties which came to these areas were

small family groups and individuals. In the case of the St. Joe River and the Stanley Basin the access to these areas is much better with reasonably good highway access available for both areas compared to none at all for the Middle Fork Salmon River and only limited access for the Main Salmon River. The types of activities engaged in by recreationists on the St. Joe River and in the Stanley Basin are camping, swimming, boating and water skiing, and back packing into the high country. The parties using these areas are largely family groups which are taking an annual vacation.

The results of the Middle Fork equation can be contrasted with those for the Stanley Basin and St. Joe Rivers. The demand for the outdoor recreation experiences in these areas tends to be more elastic than that for the Middle Fork and other Salmon River areas. This result should not come entirely as a surprise because of the nature of the recreational experiences available in these areas, the types of people who recreate in these areas, and the availability of areas relatively close by which could provide similar types of outdoor recreational experiences. In other words, there may be relatively close substitutes available for these areas. These factors would all tend to increase the elasticity of demand for outdoor recreation on the St. Joe River and Stanley Basin areas when compared to the Middle Fork-Main Salmon River areas.

A final comment on the values estimated for the Middle Fork Salmon River. The Middle Fork was an "Instant Wild River" (that is a wild river by act of congress under PL90-542). As such, it has received an increasing amount of publicity since 1968 when PL90-542

was enacted by congress. This publicity has had an impact on the use of the river in that many more people are attracted to it since it has been designated a wild and scenic river.

The consumer surplus and expenditures for outdoor recreation in the various river areas are shown in Table 5. All estimates were based on a per visitor day basis (12 hours or any part thereof). The expenditure values varied from \$1.90 per visitor day in the Stanley Basin for campground type recreation to \$18.50 per visitor day for floating the Middle Fork Salmon River. The consumer surplus values followed this same pattern varying from \$3.05 per visitor day in the Stanley Basin to \$76.88 per visitor day on the Middle Fork. The relationship between expenditure and consumer surplus was quite different in each of these demand models, which indicates that they reflected area differences. The relationship of expenditures to consumer surplus was greatest for the Middle Fork Salmon River (1:36) and least for the Corn Creek area (1:1.5). The St. Joe River ranked second to the Middle Fork (1:3.6) in the expenditure consumer surplus ratio and the others ranked as follows: Upper Basin, Lower Basin, Stanley Basin, and Corn Creek.

Table 5. Estimated Costs and Consumer Surplus per Visitor Day

River Area	Estimated No. of Visitor Days Per Trip	Estimated Average Expenditure Per Visitor Day	Estimated Average Consumer Surplus Per Visitor Day
(1) Stanley Basin	12.5	\$ 1.90	\$ 3.05
(2) St. Joe River 1971	27.7	2.50	9.00
(3) Upper Basin	16.6	4.30	12.40
(4) Corn Creek	20.4	8.40	15.55
(5) Lower Basin	11.6	7.30	11.85
(6) Middle Fork 1969	12.2	18.50	76.85

Likert-Type Scale

A Likert-Type scale is a summated scale which is used to study social attitudes. In such a scale, the individuals are asked to respond to each item in terms of several degrees of agreement or disagreement.⁸ In the present study, these degrees of agreement and disagreement were (a) very important, (b) important, (c) unimportant, and (d) unsatisfactory; or a relative scale from 1 to 5 where 1 is important and five is very important. Both types of scales were used in this study. The next step is to identify a relatively large group of items considered relevant to the subject matter being investigated, and administering these items to a group of persons who are familiar with the subject matter being investigated.

In this study a Likert-Type scale was used to develop a weighted distribution of recreationists' reaction to their outdoor recreation experiences on wild and scenic rivers. A variety of scales were used in the study and the basic items evaluated ranged from 9 to 22. These items were eventually placed into four general categories: (a) land based experiences, (b) water based experiences, (c) visual experiences and (d) other outdoor recreation activities.

Under land based experiences the items included were, camping, hiking, and hunting. The items included under the water based category were: fishing, swimming, boating (including both jet boating and rafting) and water skiing. Under the visual category the items included were sightseeing scenic beauty and photography. Finally, under other, the items included were history, archeology and scientific interest. These lists were expanded and contracted in various

portions of the study. A listing for each area is indicated in Table 6.

The Likert-Type scale, used to develop the distribution of values for various aspects of the recreational experience, was based on the various respondents' evaluation of these experiences. Two general weighting scales were used. The first was used on the Upper Basin, Corn Creek, Lower Basin and Middle Fork areas of the Salmon River and tributaries. The rating scale used was: (a) excellent, (b) important, (c) unimportant, and (d) no opinion. The weights attached to each of these items were: (a) excellent, +2; (b) important, +1; (c) unimportant, -1.

The second scale was based on a relative ranking of the importance of the activities evaluated. This scale ranged from -1, which was the least important to 4 which was the most important.

The general form of the equation used to develop the weighted scores was:

$$L_w = [(2)(E) + (1)(I) + (-1)(U)] / N$$

Where

- L_w = weighted score
- E^w = number of excellent ratings
- I = number of important ratings
- U = number of unimportant ratings
- W = the total number of observations

An example of the calculation for scenic beauty is shown:

$$\begin{aligned} L_w &= [(150)(2) + (50)(1) + (25)(-1)] / 225 \\ &= (300 + 50 - 25) / 225 \\ &= 325 / 225 \\ &= 1.44 \end{aligned}$$

In the case of the other areas the calculation was performed in a similar fashion although the rating schemes were slightly different.

Table 6. Items Included in Likert-Type Scale

Items	Stanley Basin	Upper Basin	Corn Creek	Lower Basin	Middle Fork	St. Joe River
<u>Land Resources</u>						
Hunting		X*	X	X	X	
Camping		X	X	X	X	
Hiking		<input type="checkbox"/> **	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Horse Riding	X					
Motor bike riding	X					
Back packing	X					
Picnicing						
Wildlife		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X X
<u>Water Resources</u>						
Fishing	X	X	X	X	X	
Swimming	X	X	X	X	X	X
Floating	X	X	X	X	X	X
Pure water		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
Power boats		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
Water skiing	X					X
<u>Visual Experiences</u>						
Scenic beauty		X	X	X	X	X
Photography	X	X	X	X	X	X
Sightseeing	X					X
<u>Psychic Experiences</u>						
Adventure		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
Escape from society		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
Communing with nature		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
(personal enrichment)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Family unity		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Isolation		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<u>Other Experiences</u>						
History		X	X	X	X	X
Scientific interest		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
Other		X	X	X	X	X

* Items in distribution

** Items included in distribution in Table 7

X Items included in scale

Items omitted in scale

This occurred because several types of rating questionnaires were used. The results, however, were not radically affected by changing the method of rating responses.

Once the weighted values for the resource uses were developed, a percentage distribution for the complete recreation experience was determined. With this percentage distribution, it was possible to estimate the relative importance of each of the outdoor recreation categories. The definition of aesthetics in the first round was limited to visual responses. In the second round, other types of aesthetic responses to the environment were considered in the analysis.

One of the problems with evaluating aesthetics was that it is impossible to develop mutually exclusive categories. This difficulty arises because of a number of factors. First, there is the problem of separation, how does one describe an aesthetic experience so that it does not impinge or overlap on some other part of the recreation experience? An example is white water floating. How are the visual aspects separated from the excitement of going over rapids, the flowing water, etc.? The procedure followed was to assume that all these categories were mutually exclusive. This assumption was critical to carrying out further analysis.

The information used to develop the Likert-Type scale analysis is shown in Table 7. Weighted scores were calculated for each resource category for each area considered in the analysis, and were expressed as a percentage distribution for each area. The scale appears to be sensitive to the resource base in each area which was reflected in the ranking given each resource category in each area considered in

the study. The visual resources category accounted for 29 percent of the ranking in the Stanley Basin, 34 percent in the Upper Basin, 31 percent in the Corn Creek area, 37 percent in the Lower Basin, 35 percent on the Middle Fork, and 28 percent on the St. Joe River. The comparable range for land varied from 16 to 40 percent, for water from 21 to 31 percent, and for other from 18 to 24 percent. There was not an "other" category for the Stanley Basin area because of the structure of the rating scale.

The goal of developing the percentage distributions of recreationists' responses to their wild river type of experiences was to develop an allocation scheme which would determine the distribution of the consumer surplus among the various experience patterns which were defined by the recreationists. The question is if it is assumed that the consumer surplus is a valid measure of the utility received by outdoor recreationists from their wild and scenic river experiences, then the above distribution will indicate how they allocated this utility. From this point on, the analysis consists of determining both the individual and aggregate values of each experience category.

After the above distributions were developed for the various outdoor recreation experience categories, results from the demand models were used to develop values for each experience category. This was done by using the Likert-Type scale to allocate user costs and consumer surplus values to various resource uses listed.

The estimated values for each experience category by area are shown in Table 8. The estimates shown are based on a 1969-71 data base for both the estimated expenditures and the consumer surplus

Table 8. Estimated Average Values Per Visitor Day for Outdoor Recreation Experiences

Area	<u>Expenditures</u>				
	Experience Categories				
	Land	Water	Visual	Other	Total
Stanley Basin 1971	\$ 0.76	\$ 0.59	\$ 0.55	\$ -	\$ 1.90
St. Joe River 1971	0.62	0.58	0.70	0.60	2.50
Upper Basin 1969	1.12	0.77	1.46	0.95	4.30
Corn Creek 1969	2.27	1.93	2.60	1.60	8.40
Lower Basin 1969	1.75	1.53	2.71	1.31	7.30
Middle Fork 1969	2.96	4.81	6.48	4.25	18.50
	Consumer Surplus				
Area	Land	Water	Visual	Other	Total
Stanley Basin	\$ 1.22	\$ 0.95	\$ 0.88	\$ -	\$ 3.05
St. Joe River	2.25	2.07	2.52	2.16	9.00
Upper Basin	3.22	2.23	4.22	2.73	12.40
Corn Creek	4.20	3.58	4.82	2.95	15.55
Lower Basin	2.84	2.49	4.39	2.13	11.85
Middle Fork	12.30	19.98	26.90	17.67	76.85

values derived from the demand equations shown above. The average expenditures and consumer surplus estimates were distributed using the percent distribution shown in Table 7. The values shown in Table 8 can be interpreted as the values related to each experience category based on either expenditures or consumer surplus values per visitor day. (A visitor day is defined as any portion of a 12 hour period spent recreating in the out of doors).

The next step was to extrapolate these data from the visitor day basis to the resource values involved. This extrapolation was done by multiplying the average per visitor day values by the estimated number of visitor days of use in the area being evaluated. These values for 1970 are shown in Table 9. The expenditure and consumer surplus values all reflect the distribution of the experience categories as defined using the Likert-Type scale analysis. As a result the values for the various experience categories, land, water, visual and other also reflect their use levels. It is, in other words, assumed that the level of use in an area reflects the resources of the area and the quality of the experience available in the various areas considered.

In providing a comparison between the value of outdoor recreation types of experience and development alternatives for water resources projects, the concept of consumer surplus is valid because it is used in determining the net benefits of water resources projects.⁹ In the case presented here, the row totals are the total expenditures and consumer surplus values for outdoor recreation in each area. The consumer surplus values can be used as a net economic benefit and

Table 9. Estimated Aggregate Values for Recreation Areas, 1970

Recreation Areas	Estimated No. of Visitor Days (000's)	Land (000's)	Water (000's)	Expenditures Experience Categories			Total (000's)
				Visual	Other	Other	
Stanley Basin	703.1	\$ 534.4	\$ 414.8	\$ 386.7	--	\$1,335.9	
St. Joe River	295.0	182.9	171.1	206.5	\$ 177.0	737.5	
Upper Basin	316.0	353.9	243.3	461.4	300.2	1,358.8	
Corn Creek	606.8	1,377.4	1,171.1	1,577.7	970.9	5,097.1	
Lower Basin	539.5	944.1	825.5	1,462.1	706.7	3,938.4	
Middle Fork	20.4	60.4	98.1	132.2	86.7	377.4	
<u>TOTAL</u>	2,480.8	\$3,453.1	\$2,923.9	\$4,226.6	\$2,241.5	\$12,845.1	

Recreation Areas	Estimated No. of Visitor Days (000's)	Consumer Surplus				
		Visual	Other	Other		
Stanley Basin	703.1	\$ 857.9	\$ 667.9	\$ 618.7	--	\$2,144.5
St. Joe River	295.0	663.8	610.7	743.3	\$ 637.2	2,655.0
Upper Basin	316.0	1,017.5	704.7	1,333.5	862.7	3,918.4
Corn Creek	606.8	2,548.6	2,172.3	2,924.7	1,790.1	9,435.7
Lower Basin	539.5	1,532.2	1,343.4	2,368.4	1,149.1	6,393.1
Middle Fork	20.4	250.9	407.6	548.7	360.5	1,567.7
<u>TOTAL</u>	2,480.8	\$6,870.9	\$5,906.6	\$8,537.3	\$4,799.6	\$26,114.4

compared with the net economic benefits estimated for water resource development projects on a one to one basis. In addition, Table 9 provides additional information on how the recreationists ranked their experiences in terms of the value each category received.

Moving into the body of the table, the recreationists ranked some experience categories as more important than others. What is interesting is that those categories which can be identified as aesthetic tend to rank quite high over all. These categories are visual and other. Visual included the recreationists' reaction to scenic beauty and opportunities to sightsee and practice photography. The other category included items such as the history and archeology of the area and scientific interest. In the case of St. Joe River, Upper Basin, Corn Creek, Lower Basin and Middle Fork Salmon River, the visual category ranked higher than all the other experience categories. Only in the Stanley Basin was the visual resource lower than the other categories evaluated. The reason for this was related to the way the Likert-Type scale was developed for the Stanley Basin.

The land and water categories were assumed to reflect recreationists' perception and evaluation of their outdoor recreation activities such as fishing, swimming, hunting, camping, and other activities. The visual and other categories tend to reflect more the psychic aspects of outdoor recreation experiences.

A methodology has been developed which can be used to quantify the value of the aesthetic portion of outdoor recreation experiences on wild and scenic rivers. The procedure relies on a number of assumptions and use of a Likert-Type scale models to estimate demand for such recreation and a number of key assumptions. These assump-

tions are: that (1) there is no comparison of interpersonal utility, (2) the experience categories defined for the distribution of value are mutually exclusive, and (3) all the assumptions related to the estimation of outdoor recreation demand hold.

The procedure developed here is quite flexible and a number of other aspects of it can be developed. The key to the analysis is in the Likert-Type scale. The type of scale developed can influence the nature of the model used to estimate the values in the experience categories. At the present level, the categories were defined in terms of users' direct responses. The use of indirect responses would most likely improve the sensitivity of the measurement of aesthetic parameters, particularly those related to valuing aesthetics.

The relationship between the various experience categories may be evaluated in an alternative way when one considers aesthetics. It would be quite easy to combine the visual and other experience category under the aesthetics heading. The logic for doing this would be that the items included in the other category come under what could be claimed to be aesthetic experience. These items were history, scientific interest and archeology. These items tend to increase one's appreciation of the area that one is recreating in and thereby improve the aesthetic appreciation of the area. If this approach is used, the impact on the estimated value would be great. The other category accounted for a range of from 18 to 24 percent of the distribution of values for recreating in the outdoors.

An example of the increases in aesthetic value would vary from

none for the Stanley Basin which had no other category due to the design of the questionnaire used to develop the Likert-Type scale to 58 percent of the total value on the Middle Fork. At the margin the St. Joe River would gain the most with an increase of 24 percent and the Lower Basin area the lowest with an 18 percent increase.

The range of aesthetic values involved would vary greatly. The consumer surplus would increase from \$548,700 to \$909,200 on the Middle Fork, where the percentage increase was the greatest. In the Lower Basin area, the consumer surplus for aesthetic value would increase from \$2,368,400 to \$3,517,500. The magnitudes reflect the quantity of use which each area receives.

The obvious conclusion would be that the magnitude of aesthetic value measured, using the consumer surplus technique can be manipulated to achieve the type of result desired. The point is that one needs to be careful in defining goals in this kind of research.

Summary and Conclusions

The goal of this report was to attempt to develop ways of quantifying aesthetic experiences. Several approaches to quantifying aesthetics were made with greater or lesser degrees of success.

The specific objectives were to:

1. Define outstandingly scenic areas of the Salmon River.
2. Evaluate methods of establishing values for aesthetic experiences.

The study involved inventorying landscape types as along the Salmon River as a means of achieving the first objective. The

inventory was developed using 35mm Kodachrome slides and covers the Salmon River from the headwaters to near its confluence with the Snake River.

Two attempts were made to use the slides developed in the inventory process to obtain audience response from a slide showing. Several attempts using two different formats were made with little success. One of the obvious conclusions was that unless the individuals looking at these slides had a common basis for evaluation, they could not or did not develop a consensus of opinion concerning the aesthetics' appeal or value of the slide.

The two approaches used were to show a series of two or three slide projections on the screen simultaneously and have the audience rank them on a ranking sheet. Variations of the type of ranking form were also used along with the above variations in the method of showing the slides.

The responses from the audiences were neither consistent nor did they form a concensus of opinion. The conclusions drawn were that the techniques as applied were of little value in quantifying aesthetics.

The next step in the analysis was to work with data which was obtained in a number of wild and scenic river projects that related to the development of methodology, and also a study in the Stanley Basin of Idaho, designed to estimate the demand for outdoor recreation in that area. Finally, data from a study on recreational use of the St. Joe River was also used to evaluate aesthetic experiences.

The procedure used in this portion of the study was to develop recreational demand equations for each area studied. The areas

involved were the Stanley Basin, the St. Joe River, three areas along the Salmon River and the Middle Fork Salmon River. The three areas along the Salmon River were the Upper Basin area downstream from Stanley, Idaho to Clayton, Idaho; Corn Creek, the area from North Fork, Idaho downstream to Salmon Falls; Lower Basin, downstream from Salmon Falls to White Bird, Idaho. The recreational demand curves were developed for each river area.

As a part of the demand analysis the consumer surplus was estimated for each area and the value of aesthetics was related to the amount of consumer surplus in each area. This was done by designing a scaling questionnaire which allowed the recreational users interviewed to rank a bundle of recreational experiences. These rankings were then summed and a summated Likert-Type scale analysis was used to develop a distribution which ranked the experiences. The experience categories used were: (1) land experiences, which included such items as hiking, camping, hunting, etc.; (2) water experiences, which included swimming, fishing, boating, floating, etc.; (3) visual experiences, which included an evaluation of scenic beauty, opportunities for photography and opportunities for sightseeing; (4) other, which included the history of the area, scientific interest and other miscellaneous items.

Once the ranking scale was developed, and the distribution of experiences determined, the distribution was applied to the expenditures and consumer surplus values estimated in the demand portion of the analysis. The assumption used to justify this procedure was that the consumer surplus is a valid measure of the value of the

whole recreational trip and experience.

A second assumption is that the experience categories are mutually exclusive. A third assumption is that no interpersonal comparisons of utility are being made. Given the above assumption, it is possible to estimate the value of each portion of the recreation experience. This was done and the values are shown in the body of the work. The range in values varied by area and to a large extent reflect the quality of the recreational resources as measured by the ease of access and cost of recreating and the type of recreation engaged in in the area as reflected through the type of person recreating, type of activities engaged in and related factors.

The values of the visual experience category was low in the Stanley Basin, where most of the activities took place in campgrounds and on lakes. The demand models reflect the increased difficulty of access in river areas compared to the relative ease of access in the Stanley Basin area. The access to the Stanley Basin is mainly by U. S. Highway 93 and State Highway 27 (Idaho). The access to the recreational areas in the Upper Basin area is by highway in the Corn Creek area, by 52 miles of secondary roads off Highway 93 and then by boat. In the Lower Basin area the access is by U. S. Highway 95 and then upstream by a secondary road 26 miles and the rest of the way by jet boat. Access on the Middle Fork by car is only to Dagger Falls, the starting point for float trips and at the confluence with the Salmon River. On the St. Joe River, access is by Forest Highway which is of variable standards over its total distance.

The overall conclusion of this study is that the quantifying

of aesthetic values is yet an imperfect art. The procedures developed herein must be looked upon with skepticism because of the limiting assumptions made. These assumptions were necessary in order to make any progress at all toward the goal of quantifying aesthetics in any realistic way.

Secondly, however, if water resource planners and researchers are willing to accept these assumptions and the overall approach, the author feels that it would be possible to include the direct consideration of aesthetic values quantified in the manner done in this report as a part of the process of evaluating wild and scenic rivers. This would be done with the full knowledge and understanding of the limitations of the method. If done in this fashion, it would permit planners to directly indicate the value recreational users put on the experiences they have with the water resources being evaluated.

Thirdly, it is recommended that this technique be subjected to more study and research to determine how consistent it is. Another question is how stable are the distributions which have been developed? Will they change as the cost of recreation increases? Economic theory would lead one to believe that they would change as costs increase, just as the quantity of recreation consumed would tend to vary with the cost of the recreation trip.

Although aesthetics ranked high, based on the visual experience category in this analysis, it should not be assumed that people would be willing to pay high prices to enjoy them. Aesthetics are only a part of the overall recreation experience, and therefore the lack of a direct pricing mechanism may be the reason it had such a

high value. If fees were imposed on recreation based on the results of the demand analysis, recreationists' responses to increasing cost levels for outdoor recreation would likely be reflected in less use. The elasticity of demand would be an important factor in accounting for the value of all the experience categories discussed in this report.

The Likert-Type scale, as developed for this study, indicates the way recreationists would distribute the value of their experiences among the several categories. The option value (a value defined as the value existing for a good or service which should be added to consumer surplus when there is uncertainty in demand) is not included, the Likert-Type scale analysis most likely underestimates the value of aesthetics.¹⁰ However, because no other approximations of aesthetic value have any empirical basis, the Likert-Type consumer surplus approach, as developed in this study, is a useful approximation to the quantification of aesthetic value.

FOOTNOTES

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APPENDIX I
QUESTIONNAIRES

1. Is this your first trip to the Sawtooth Area? Yes ___ No ___
 If not, how many trips have you made: this year ___ previous years ___

2. How did you find out about the Sawtooth Area?

Friends Advertisement
 Relatives Previous visit
 General reading Other (explain) _____
 (magazines, books)

Comments: _____

3a. Do you consider this visit to the Sawtooth Area the only purpose of your trip. Yes ___ No ___

If not, then what is the purpose? _____

3b. What type of visit are you making?

Annual vacation
 One of two or more annual vacations
 Weekend trip
 Combined business-vacation
 Other (explain) _____

4a. Did you stop to visit any other places on your trip here?

Yes ___ No ___
 If so, please indicate:

	Where	Length of Visit	Type of Visit
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____

4b. Will you visit any places on your trip home? Yes No

	Where	Planned Length of Stay	Type of Visit
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____

5a. Based on your experience in this part of the Sawtooth Area, would you like to see:

	More	Less	No Change	No Opinion
Campsites	_____	_____	_____	_____
Campgrounds	_____	_____	_____	_____
Firewood	_____	_____	_____	_____
Well water	_____	_____	_____	_____
Toilets	_____	_____	_____	_____
Litter disposal	_____	_____	_____	_____
Hiking trails	_____	_____	_____	_____
Motor bike trails	_____	_____	_____	_____
Access Trails	_____	_____	_____	_____
Recreational subdivision	_____	_____	_____	_____
Other (explain)	_____	_____	_____	_____

Comments: _____

5b. Would you suggest any changes (not covered in question 5a) that would make your stay more enjoyable? Yes No

If so, please describe: _____

5c. Have there been any negative aspects to your visit here? Yes No

If so, please describe: _____

5d. How would you describe the Sawtooth area in relation to the number of people?

- Used beyond capacity
- About right
- Used under capacity
- No opinion

6. Your opinion is needed to help determine whether the Sawtooth Valley and Mountain Area should become either a National Recreational Area, a National Park, some combination of both, or be left as it is. Please indicate your preference below.

- National Park
- National Recreation Area
- Combination
- Left as it is
- No Opinion

Comments: _____

7. The Sawtooth Area appeals to people for many different reasons.

Which activities are you participating in Please rank, by number the activities you participate in most (1=most participation)

Fishing	_____	_____
Camping	_____	_____
Canoeing or Rafting	_____	_____
Power Boating	_____	_____
Water Skiing	_____	_____
Hiking	_____	_____
Back Packing	_____	_____
Horse Riding	_____	_____
Motor Bike Riding	_____	_____
General enjoyment and sightseeing	_____	_____
Swimming	_____	_____
Photography	_____	_____
Other (specify) _____	_____	_____

8. Do you feel that for this part of the Sawtooth Area, opportunities to enjoy the items listed below are:

	Excellent	Good	Fair	Poor	No Opinion
Scenic Beauty	_____	_____	_____	_____	_____
Wildlife	_____	_____	_____	_____	_____

Excellent Good Fair Poor No Opinion

Family Unity _____
 History of Area _____
 Escape from Society _____
 Other (specify) _____

9a. What category best describes the group you are visiting with?

____ Family
 ____ Husband or Wife
 ____ Family and Relatives
 ____ Family and Friends
 ____ Other (explain) _____

9b. How many are in this group?

____ Males 18 and over
 ____ Males under 18
 ____ Females 18 and over
 ____ Females under 18

10a. Where do you live? City _____ State _____
 or Province _____

If you live outside the U.S. and Canada: Country: _____

10b. What is your:

Age ____ Sex ____ Occupation _____
 Years in this occupation _____ Relation to head of Family ____

10c. How many weeks of paid vacation do you have each year? _____ wks.

Total annual vacation time (not counting holidays) _____ wks.

10d. If you are retired, how many weeks do you vacation each year? ____ wks.

10e. How long will you stay in the Sawtooth Area this trip? _____ days

10f. Do you plan to come back in the future? Yes ____ No ____ WHY? _____

11. Which category best describes the location you:

<u>Presently live</u>	<u>Years in that Location</u>	<u>Lived prior to age 18</u>	<u>Yrs. in Location</u>
<u> </u> Farm	<u> </u>	<u> </u> Farm	<u> </u>
<u> </u> Rural Non-Farm	<u> </u>	<u> </u> Rural Non-Farm	<u> </u>
<u> </u> Town (5,000 or less)	<u> </u>	<u> </u> Town (5,000 or less)	<u> </u>
<u> </u> City (5,000-25,000)	<u> </u>	<u> </u> City (5,000-25,000)	<u> </u>
<u> </u> City (25,000-100,000)	<u> </u>	<u> </u> City (25,000-100,000)	<u> </u>
<u> </u> City (100,000-1 mil)	<u> </u>	<u> </u> City (100,000-1 mil)	<u> </u>
<u> </u> City (over 1 mil)	<u> </u>	<u> </u> City (over 1 mil)	<u> </u>

12. What was the approximate total yearly income of your family in 1970?

- Less than 2,999
- 3,000-4,999
- 5,000-6,999
- 7,000-9,999
- 10,000-14,999
- 15,000-19,999
- 20,000-24,999
- over 25,000

13. What is the highest level of education you have completed?

- Grade 0-8
- Grade 9-12
- Some college or additional schooling
- College graduate
- Postgraduate degree

14. About how many miles did you travel coming here? _____ miles.
 About how many miles will you travel going back? _____ miles

How many hours or days:

1. Did you spend traveling here? _____ hrs. _____ days.
2. Will you spend traveling home? _____ hrs. _____ days.

15a. What will be the approximate total cost of your entire trip? _____

How much of this will be spent in Idaho? _____

15b. How much do you expect to spend on the entire trip for:

	TOTAL	IN IDAHO
A. Transportation		
Personal Vehicle (gas, repairs, etc.)	_____	_____
Fares (bus, Plane, Train, etc.)	_____	_____

	TOTAL	IN IDAHO
Other (explain) _____	_____	_____
B. Lodging (motels, campground, fees, etc.)	_____	_____
C. Food and beverage	_____	_____
D. Guide or outfitter services	_____	_____
E. Recreational supplies (lures, licenses)	_____	_____
F. Rental of:		
boat, motor, and equipment	_____	_____
tackle and gear	_____	_____
G. Other (magazines, film, etc.)	_____	_____

15c. How many people do the above expenditures cover? _____
 Approximately what percentage was spent in the Sawtooth Valley
 and Mountain Area? _____%.

Interviewer _____

Weather _____ Temperature _____

Place _____

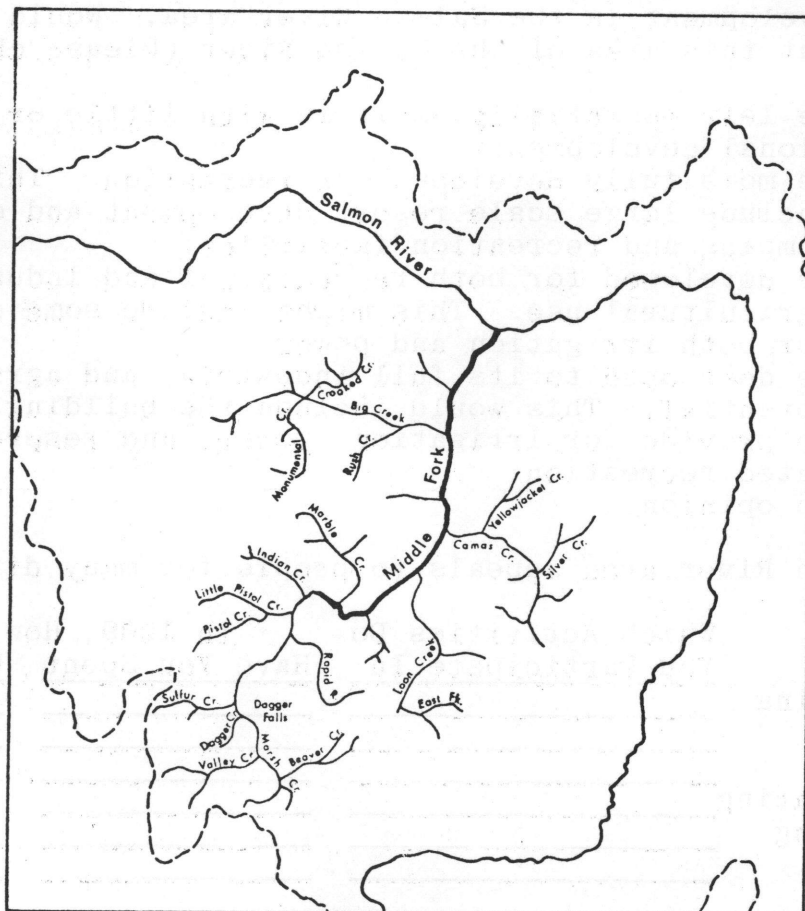
Date _____ Time _____

Accommodations: Tent Trailer
 Camper Other

QUESTIONNAIRE ON USER OPINIONS OF RECREATION OF
IDAHO'S SALMON RIVER AND ITS TRIBUTARIES

Part of the Middle Fork of the Salmon River has been designated by Congress for inclusion into the nation's Wild and Scenic River System. Other sections of the Salmon River have yet to be classified. For these reasons, a study of the value and use of Idaho's Salmon River is being conducted by the Idaho Water Resources Research Institute.

Your personal opinion will be important in determining the type and extent of future development and use of the Salmon River area. Please assist us by answering this questionnaire as carefully as you can. Individual replies remain confidential, and any information you give us will not be used for any other purpose.



1. Is this your first trip to this area of the Salmon River?
 Yes ___ No ___

If no, how many trips have you made to this area in 1969? _____
 Previous Years? _____

Have you visited any other areas of the Salmon River? Yes ___ No ___

2. Is visiting this part of the Salmon River the main reason for your trip? Yes ___ No ___

If you answered NO, is the main reason for your trip:

- Business _____
- Day Off _____
- Weekend Trip _____
- Visiting with Friends
or Relatives _____
- Part of an Extended
Vacation _____
- Just Passing By _____
- Other (Please specify) _____

3. One of the goals of this study is to ascertain visitors' feelings toward development in the Salmon River area. Would you MOST prefer that this area of the Salmon River (Please check ONE):

- a. ___ Be left essentially as it is with little or no recreational development.
- b. ___ Be more fully developed for recreation. This might include large scale resort development and expanded camping and recreation facilities.
- c. ___ Be developed for both recreational and industrial-agricultural use. This might include some construction for both irrigation and power.
- d. ___ Be developed to its full industrial and agricultural potential. This would include the building of dams to provide for irrigation, power, and reservoir associated recreation.
- e. ___ No opinion.

4. The Salmon River area appeals to people for many different reasons.

	Which Activities Do You Participate In	In 1969, How Many Days Have You Spent	Will You Spend
Sight seeing	_____	_____	_____
Swimming	_____	_____	_____
Canoeing	_____	_____	_____
River floating	_____	_____	_____
Skin diving	_____	_____	_____
Camping	_____	_____	_____

	<u>Which Activities Do You Participate In</u>	<u>In 1969, How Many Days Have You Spent</u>	<u>Will You Spend</u>
Motor boating	_____	_____	_____
Fishing	_____	_____	_____
Hunting	_____	_____	_____
Picnicing	_____	_____	_____
Other (please list)	_____	_____	_____

With regard to the Salmon River area, which do you regard as your most important activity? _____

5. With regards to the number of people you saw on this section of the Salmon, would you describe the river as:

Too Crowded _____ Not Used Enough _____
Just Right _____ No Opinion _____

6. Based on your experience on this section of the river, would you like to see:

	<u>More</u>	<u>Less</u>	<u>No Change</u>	<u>No Opinion</u>	<u>Comment</u>
Parking areas	_____	_____	_____	_____	_____
Boat launching areas	_____	_____	_____	_____	_____
Directional and inform- ational signs	_____	_____	_____	_____	_____
Concessions	_____	_____	_____	_____	_____
Lodges and/or cabins	_____	_____	_____	_____	_____
Campgrounds	_____	_____	_____	_____	_____
Toilets	_____	_____	_____	_____	_____
Fireplaces and firewood	_____	_____	_____	_____	_____
Tables	_____	_____	_____	_____	_____
Litter disposal	_____	_____	_____	_____	_____
Hiking trails	_____	_____	_____	_____	_____
Others (please specify)	_____	_____	_____	_____	_____

7. Do you feel that for this section of the Salmon River, opportunities to enjoy the items listed below are:

	<u>Excellent</u>	<u>Satisfactory</u>	<u>Unsatisfactory</u>	<u>No Opinion</u>
Scenic beauty	_____	_____	_____	_____
Hunting	_____	_____	_____	_____
Fishing	_____	_____	_____	_____
Swimming	_____	_____	_____	_____
Camping	_____	_____	_____	_____
Photography	_____	_____	_____	_____
Boating	_____	_____	_____	_____
History of area	_____	_____	_____	_____
Other (please list)	_____	_____	_____	_____

	<u>Excellent</u>	<u>Satisfactory</u>	<u>Unsatisfactory</u>	<u>No Opinion</u>
<u>A. Unique River Experience</u>				
Adventure	_____	_____	_____	_____
Isolation	_____	_____	_____	_____
Excitement of river	_____	_____	_____	_____
Personal enrichment	_____	_____	_____	_____
Communing with nature	_____	_____	_____	_____
Other (please list)	_____	_____	_____	_____

<u>B. Participation Activities</u>				
Hiking	_____	_____	_____	_____
Sight seeing	_____	_____	_____	_____
Floating	_____	_____	_____	_____
Other (please list)	_____	_____	_____	_____

<u>C. Other Features</u>				
Family unity	_____	_____	_____	_____
Escape from society	_____	_____	_____	_____
Scientific interest	_____	_____	_____	_____
Wildlife	_____	_____	_____	_____
Free flowing pure water	_____	_____	_____	_____
Other (please list)	_____	_____	_____	_____

8. Of the above, which did you consider MOST important or enjoyable. Please list) _____

9. Did you fish in this area of the Salmon River? Yes ___ No ____.
Will you fish? Yes ___ No _____. (Fishing at time of interview? _____)

Please give the approximate number of species of fish you caught and then rank your satisfaction with the following types of fishing on the river:

	<u>Number Of Fish</u>	<u>Excellent</u>	<u>Satisfactory</u>	<u>Unsatisfactory</u>	<u>No Opinion</u>
Trout	_____	_____	_____	_____	_____
Salmon	_____	_____	_____	_____	_____
Steel-head	_____	_____	_____	_____	_____

	<u>Location</u>	<u>Population</u>
City center	_____	Under 5,000 _____
Suburb of city	_____	5,000-10,000 _____
Rural - not on a farm	_____	10,000-25,000 _____
Rural - on a farm	_____	25,000-100,000 _____
Other (please specify)	_____	100,000-1,000,000 _____
		Over 1,000,000 _____

15. What was the approximate total yearly income of your family in 1968?

Under \$2,999 _____	\$10,000-14,999 _____
3,000-4,999 _____	15,000-19,999 _____
5,000-6,999 _____	20,000-24,999 _____
7,000-9,999 _____	25,000 & over _____

16. What is the highest level of education you completed?

Grade 0-8 _____
Grade 9-12 _____
Some College _____
College Graduate _____
Post-graduate degree _____

17. How many miles was your family car driven on this trip? _____

Did you come directly here? Yes ___ No ___

If you traveled as a group in your family car to get to the river, how much of the transportation cost were paid to you by non-family members of the group? _____

18. On this trip to the river, how much did your family spend for:

	<u>Total</u>	<u>In Idaho</u>	<u>Number of Days</u>
Transportation (Gas, repairs, etc.)	_____	_____	_____
Lodging (Motels, Campground fees, etc.)	_____	_____	_____
Food and beverages	_____	_____	_____
Guide service	_____	_____	_____
Recreational supplies (Fishing gear, licenses, etc.)	_____	_____	_____
Rental of:			
Boats and motors	_____	_____	_____
Camping gear	_____	_____	_____
Other (please list)	_____	_____	_____

Interviewer _____ Date _____ Time _____

Location _____

Weather _____ Temperature _____

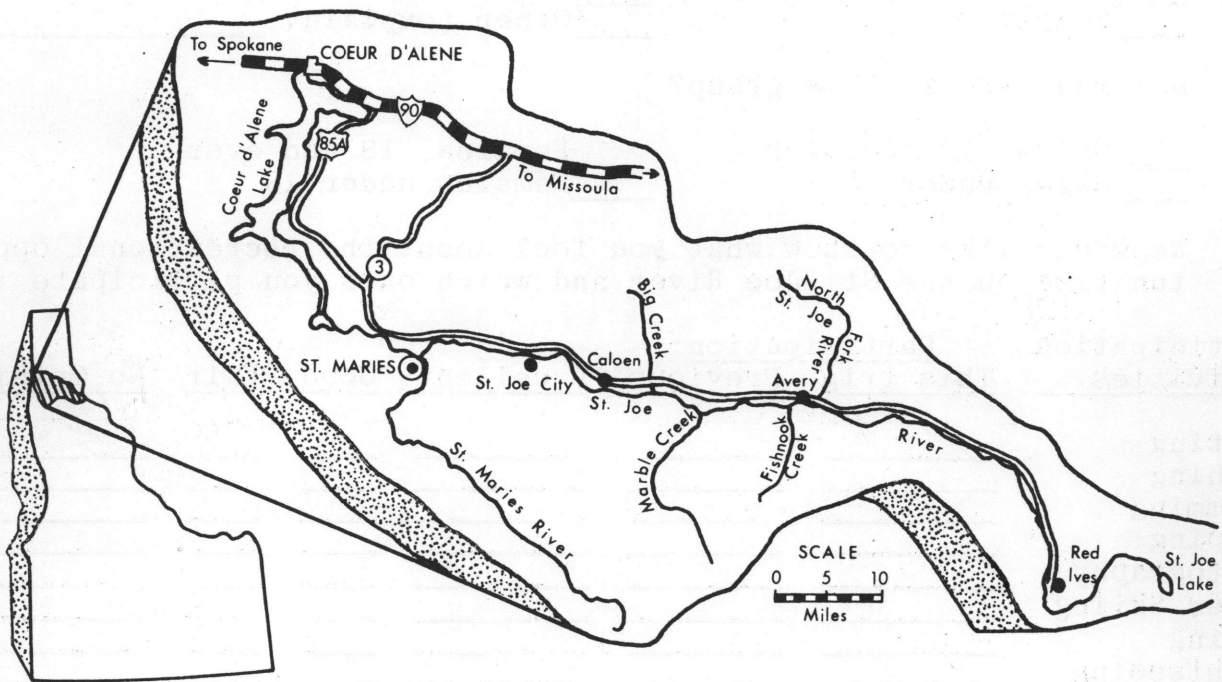
River Condition _____

Important Comments: _____

QUESTIONNAIRE ON USER OPINIONS OF RECREATION
IN THE ST. JOE RIVER BASIN

The St. Joe River has been designated by Congress for possible inclusion into the Nation's Wild and Scenic River System. For this reason a study of the recreation value and use of the St. Joe River is being conducted by the Idaho Water Resources Research Institute.

Your personal opinion will be important in determining the type and extent of future development and use of the St. Joe River basin. Please assist us by answering this questionnaire as carefully as you can. Individual replies remain confidential, and any information you give us will not be used for any other purpose than generating economic statistics.



- 1a. Is this your first trip to this area of the St. Joe River?
Yes ___ No ___
- 1b. If no, how many trips have you already made to this area in 1971? _____
- 1c. How many trips have you made in previous years? None ___
A Few ___ Many ___
- 2a. Is visiting this part of the St. Joe Area the main reason for your trip? Yes ___ No ___
- 2b. If no, what is the main reason? _____

3. What type of visit are you making?
 ___ Annual vacation ___ Combined business-vacation
 ___ One of two or more annual ___ Other (explain) _____
 vacations
 ___ Weekend trip or holiday
- 4a. What category best describes the group that is visiting the St. Joe Area with you?
 ___ Individual ___ Family and Relatives
 ___ Husband or Wife only ___ Family and Friends
 ___ Family ___ Other (explain) _____
- 4b. How many are in this group?
 ___ Males, 18 and over ___ Females, 18 and over
 ___ Males under 18 ___ Females under 18
5. We would like to know what you feel about the recreational opportunities on the St. Joe River and which ones you participate in.

Participation Activities	Participation:					
	This trip	Previous	Excellent	Good	Fair	No Opinion
Hunting	_____	_____	_____	_____	_____	_____
Fishing	_____	_____	_____	_____	_____	_____
Swimming	_____	_____	_____	_____	_____	_____
Camping	_____	_____	_____	_____	_____	_____
Photography	_____	_____	_____	_____	_____	_____
Water Skiing	_____	_____	_____	_____	_____	_____
Hiking	_____	_____	_____	_____	_____	_____
Sightseeing	_____	_____	_____	_____	_____	_____
Picnicing	_____	_____	_____	_____	_____	_____
Floating	_____	_____	_____	_____	_____	_____
Power boating	_____	_____	_____	_____	_____	_____

Participation Activities	Participation:				Fair	No Opinion
	This trip	Previous	Excellent	Good		
Other Features (Year Around)						
Scenic beauty	_____	_____	_____	_____	_____	_____
Scientific interest	_____	_____	_____	_____	_____	_____
History of area	_____	_____	_____	_____	_____	_____
Wildlife	_____	_____	_____	_____	_____	_____
Adventure	_____	_____	_____	_____	_____	_____
Escape from society	_____	_____	_____	_____	_____	_____
Communing with nature	_____	_____	_____	_____	_____	_____
Free flowing pure water	_____	_____	_____	_____	_____	_____
Other (please list)	_____	_____	_____	_____	_____	_____

6a. Of the above which did (or do) you consider the most important or enjoyable to you on a year around basis? This section of the river _____ the entire river _____

6b. In any respect, do you consider the recreational opportunities in the St. Joe River Area unique? Yes ___ No ___ If yes, please list _____

7. With respect to the number of people using the St. Joe River for recreational purposes would you describe this section of the river as:

7a. _____ Too crowded _____ Not used enough
 _____ Just right _____ No opinion

7b. If you answered "too crowded", which activities and/or experiences were affected? _____

8. One of the goals of this questionnaire is to ascertain the recreationist's feeling toward the development of the St. Joe River Basin. Which of the following would you MOST prefer for the St. Joe River Basin. (Please check one)

- _____ a. be left essentially as it is with little or no further development
- _____ b. be more fully developed for recreation including expanded camping and recreation facilities and improved access.

- c. be developed for both recreational (large scale resort development, etc.) and limited agricultural or commercial uses. This might include some construction for flood control, restricted timber harvest, and mining.
- d. be developed to its full economic potential. This would include the building of dams and roads to provide for flood control, power, and reservoir associated recreation, timber harvest and mining.
- e. Other (Please specify) _____
- f. No Opinion

9. Have any of the recreational activities that you participate in been restricted because of lack of access to or through private property? Yes No

If yes, which activities have been restricted? (Please list) _____

10. Do you feel that the recreational activities you participate in would be significantly improved if better access to the river was provided? Yes No

If yes, which activities (Please list) _____

11. Based on your experience on this section of the river, would you like to see:

	More	Less	No Change	No Opinion
Parking areas	_____	_____	_____	_____
Boat launching areas	_____	_____	_____	_____
Directional and informational signs	_____	_____	_____	_____
Concessions	_____	_____	_____	_____
Lodges and/or cabins	_____	_____	_____	_____
Campgrounds	_____	_____	_____	_____
Toilets	_____	_____	_____	_____
Fireplaces and firewood	_____	_____	_____	_____
Tables	_____	_____	_____	_____
Litter disposal	_____	_____	_____	_____
Hiking trails	_____	_____	_____	_____
Private summer homes	_____	_____	_____	_____
Subdivisions of private property	_____	_____	_____	_____
Others (please specify)_____	_____	_____	_____	_____

Comments: _____

12. Previously, did you know that the St. Joe River is being studied for possible inclusion in the Wild and Scenic Rivers System?
 Yes ___ No ___
13. Are you familiar with the Wild and Scenic Rivers Act passed by Congress in 1968? Yes ___ No ___
14. Since a summary of the possible effects to you as a recreationist has now been presented you, what is your opinion of including the St. Joe River in the Wild and Scenic Rivers System?
- ___ a. Strongly favor ___ d. Mildly oppose
 ___ b. Mildly favor ___ e. Strongly oppose
 ___ c. Indifferent

Why? _____

15. The differences between the possible types of river classifications have been described to you. For each section of the river, which classification would you most prefer? (Please check one for each segment of the river):

	Should not be included	Recreation	Scenic	Wild
Lower St. Joe	_____	_____	<u>XXXXXX</u>	<u>XXXX</u>
Avery/Red Ives	_____	_____	_____	<u>XXXX</u>
Upper St. Joe	_____	_____	_____	_____

16. If the St. Joe River was included in the Wild and Scenic Rivers System, would recreation use in your opinion:

- ___ a. Increase ___ c. Not change
 ___ b. Decrease ___ d. No opinion

17. If a fee, permit, or reservation system is proposed as a way of preserving the area for public recreation use, would you be willing to pay an additional amount in order to utilize the recreation opportunities available in the St. Joe River Basin? Yes ___ No ___

If yes, on a per family basis, how much per day would you be willing to pay?

- ___ a. \$1.00
 ___ b. \$3.00
 ___ c. \$5.00
 ___ d. More than \$5.00 (please indicate how much) \$ _____

18a. Which category best describes the location where you presently live?

- Farm City (25,000-100,000)
- Rural Non-Farm City (100,000-1,000,000)
- Town (5,000 or less) City (over 1,000,000)
- City (5,000-25,000)

18b. How long have you resided at that location? _____ yrs.

19a. About how many miles did you travel coming here? _____ miles.

19b. About how many miles will you travel going back? _____ miles.

19c. About how many miles do you estimate you have driven or will drive in the River Basin? _____ miles

19d. How many hours or days:

1. Did you spend traveling here _____ hrs. _____ days.
2. How many days have you spent _____ will you spend in the St. Joe River Basin this trip?
3. Will you spend traveling home _____ hrs. _____ days.

20. Did you stop to visit any other major recreational area(s) on your trip here? Yes ___ No ___

If yes, please indicate:

Where	Length of Visit	Type of Visit
_____	_____	_____
_____	_____	_____

21. What will be the approximate total cost of your visit? \$ _____

	TOTAL	IN IDAHO
A. Transportation	_____	_____
Personal vehicle (gas, repairs, etc.)	_____	_____
Airline, bus and train fares	_____	_____
Other (please list) _____	_____	_____
B. Lodging (motels, campground fees, etc.)	_____	_____
C. Food and beverages	_____	_____
D. Guide or outfitter service	_____	_____
E. Recreational supplies (lures, licenses)	_____	_____
F. Rental of:		
Boat and equipment	_____	_____
Tackle and gear	_____	_____
G. Other (magazines, film, etc.)	_____	_____

22a. How many people do the above expenditures cover? _____ Approximately what percentage was spent in the St. Joe River Basin? _____ %.

22b. Approximately what percentage of the total trip expenses should be allocated to your St. Joe visit? _____ %

Thank you for your answers. In order to make comparisons between the people who visit the St. Joe River Area, we would like some general information about you.

23. Are you a resident of Idaho? Yes ___ No ___

If yes, what town? _____ County _____
If no, what is your state (or Nation) of residence? _____

24. Do you own any property in the St. Joe River Basin? Yes ___ No ___

25. What is your age? _____ Sex _____ Occupation _____
Relationship to head of family _____

26. How many weeks of paid vacation do you have each year? _____ wks.
Do you take any unpaid vacation time? Yes ___ No ___

If yes, how much? _____ wks.
If you are retired, how many weeks do you vacation each year? ___ wks.

27. What was your family's total yearly income before taxes in 1970?

_____ Under \$3,000	_____ 10,000-14,999
_____ 3,000-4,999	_____ 15,000-19,999
_____ 5,000-6,999	_____ 20,000-24,999
_____ 7,000-9,999	_____ 25,000 +

28. What is the highest level of education that you have completed?

_____ Grade 0-8	_____ College graduate
_____ Grade 9-12	_____ Some graduate school
_____ Some college or	_____ Post-graduate degree
_____ additional schooling	_____ Other (please specify) _____

Interviewer _____ Date _____ Time _____

Location _____

Weather _____ Temperature _____

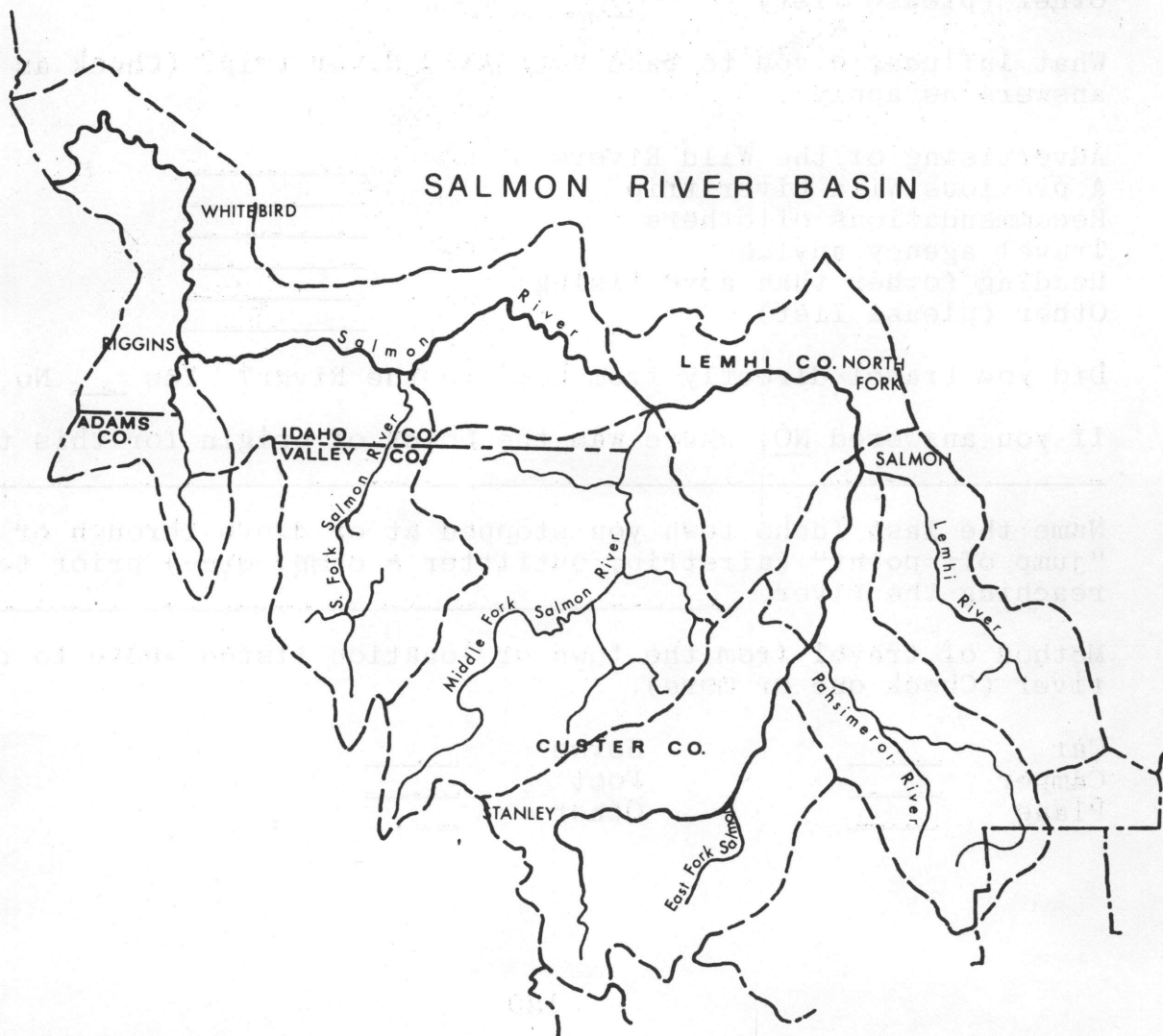
River Condition _____

Important Comments:

QUESTIONNAIRE ON USER OPINIONS OF RECREATION ON
IDAHO'S SALMON RIVER AND ITS TRIBUTARIES

The Salmon River has been designated by Congress for possible inclusion into the Nation's Wild and Scenic River System. For this reason, a study of the value and use of Idaho's Salmon River is being conducted by the Idaho Water Resources Research Institute.

Your personal opinion will be important in determining the type and extent of future development and use of the Salmon River area. Please assist us by answering this questionnaire as carefully as you can. Individual replies remain confidential, and any information you give us will not be used for any other purpose.



WILD AND SCENIC RIVER QUESTIONNAIRE

1. Was the Wild River visit the MAIN reason for your trip? Yes No

If yes, did you also:

Conduct any business	_____
Do any hunting	_____
Do any fishing	_____
Visit friends or relatives	_____
Others (please list)	_____

If the Wild River visit was NOT the main reason for your trip, was it:

Business	_____
Combination hunting and fishing	_____
Visiting friends or relatives	_____
Part of an extended vacation	_____
Other (please list)	_____

What influenced you to take your Wild River trip? (Check as many answers as apply)

Advertising of the Wild Rivers	_____
A previous Wild River trip	_____
Recommendations of others	_____
Travel agency advice	_____
Reading (other than advertising)	_____
Other (please list)	_____

2. Did you travel directly from home to the River? Yes No

If you answered NO, where was the point of origin for this trip?

Name the last Idaho town you stopped at or drove through or the "jump off point" (airstrip, outfitter's camp, etc.) prior to reaching the river. _____

3. Method of travel from the town or location listed above to the river (Check one or more).

Car	_____	Horse	_____
Camper	_____	Foot	_____
Plane	_____	Other	_____

4. What type and capacity of boat did you use on the river? _____

Did the guide service (comercial outfitter) provide the boat?

Yes ___ No ___; the equipment? Yes ___ No ___

If your answer is no, what was your source of boat and equipment?

5. Number in trip. Adult males ____, Females ____, 18 or under ____,
Boys ____, Girls ____

6. Which category best describes the group you made the river trip
with?

Individual _____
Husband and wife _____
Family _____
Family and Friends _____
Friends _____
Member of an Organization _____
Other (please describe) _____

7. How many days did you spend (have you spent) on the river? _____

How many more days do you plan to spend on the river? _____

What date did you start your trip? Month _____ Year _____

8. Is this your first trip on the Salmon River? Yes ___ No ___

If No, how many trips have you made on the Salmon? _____

On other Wild Rivers? List. _____

Do you plan on making other Wild River trips? Yes ___ No ___
No Opinion ___

9. One of the goals of this study is to ascertain users feeling
toward possible development on those areas of the Middle Fork
and Main Stream of the Salmon River that have not been design-
ated as "Wild River." Would you MOST prefer that these areas:

- ___ A. Be left essentially as is with little or no recreational
development.
- ___ B. Be more fully developed for recreation. This might include
large scale resort development and expanded camping and
recreation facilities.
- ___ C. Be developed for both recreational and industrial-agri-
cultural use. This might include some construction for
both irrigation and power.

___ D. Be developed to its full industrial and agricultural potential. This would include the building of dams to provide for irrigation, power, and reservoir associated recreation.

___ E. No opinion.

10. Now that you have traveled the river, would you be willing to pay a user permit fee for the experience? Yes ___ No ___ No opinion ___

If a fee were charged per individual, would you list your order of preference 1 through 4 for method of paying fee. Then indicate how much you would be willing to pay for EACH type of fee.

	Prefer- ence	None	\$1	\$5	\$10	\$25	More
An annual fee for use of <u>ALL</u> the Wild Rivers	_____	_____	_____	_____	_____	_____	_____
An annual fee for <u>EACH</u> Wild River	_____	_____	_____	_____	_____	_____	_____
A fee for each <u>TRIP</u> on the Wild River	_____	_____	_____	_____	_____	_____	_____
A fee based on Number of Days on the Wild River	_____	_____	_____	_____	_____	_____	_____
Other	_____	_____	_____	_____	_____	_____	_____

11. With regards to the numbers of people you saw on your trip, did you:

A. Expect to Find:

Nobody else _____
 Fewer People _____
 Numbers encountered _____
 More people _____

B. Feel the River was:

Too crowded _____
 Just right _____
 Not used enough _____
 No opinion _____

12. Based on your experience on the river, would you like to see:

	More	Less	No Change	No Opinion	Brief Optional Comments
Campsites	_____	_____	_____	_____	_____
Toilets	_____	_____	_____	_____	_____
Fireplaces	_____	_____	_____	_____	_____
Tables	_____	_____	_____	_____	_____
Directional & information signs	_____	_____	_____	_____	_____
Lodges and/or cabins	_____	_____	_____	_____	_____
Firewood supplied	_____	_____	_____	_____	_____
An interpretive brochure to take with you	_____	_____	_____	_____	_____
Better litter disposal	_____	_____	_____	_____	_____
Concessions	_____	_____	_____	_____	_____
Others (please specify)	_____	_____	_____	_____	_____

13. Do you think that travel on the river should be regulated now?
 Yes ___ No ___

Do you feel that travel on the river may have to be regulated
 in the future? Yes ___ No ___

If you answered YES, to either of the above, would you approve:

	Present		In the Future	
	<u>Yes</u>	<u>No</u>	<u>Yes</u>	<u>No</u>
Application for travel on a lottery basis	___	___	___	___
Regulated launch times	___	___	___	___
"Flow Control" on the river (Required number of miles per day)	___	___	___	___
Assigned campgrounds prior to launch	___	___	___	___
Stops permitted only at designated areas	___	___	___	___
Fires at only designated areas	___	___	___	___

14. Did you (or will you) fish on your Salmon River Trip? Yes ___ No ___

If you fished, please give the approximate number of the species listed below that you caught, then rank your satisfaction with the fisheries.

	<u># of Species</u>	<u>Excellent</u>	<u>Satisfactory</u>	<u>Unsat.</u>	<u>No Opinion</u>
Trout	_____	_____	_____	_____	_____
Salmon	_____	_____	_____	_____	_____
Steelhead	_____	_____	_____	_____	_____
Dolly Varden (Bull Trout)	_____	_____	_____	_____	_____
Other	_____	_____	_____	_____	_____

Please indicate the approximate number of trout or Dolly Varden you caught in each size category.

10" or less _____, 11" to 14" _____, 15" or over _____

15. With regards to your personal experience on your Wild River trip, do you feel that each item listed below was:

<u>Unique River Experience</u>	<u>Very Important</u>	<u>Moderately Important</u>	<u>Unimportant</u>	<u>No Opinion</u>
A. Scenic Beauty	_____	_____	_____	_____
B. Adventure	_____	_____	_____	_____
C. Isolation	_____	_____	_____	_____
D. Excitement of river	_____	_____	_____	_____
E. Personal Enrichment	_____	_____	_____	_____
F. Communing with nature	_____	_____	_____	_____
G. Other (Please list)	_____	_____	_____	_____

<u>Participation Activities</u>	<u>Very Important</u>	<u>Moderately Important</u>	<u>Unimportant</u>	<u>No Opinion</u>
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A. Hunting	_____	_____	_____	_____
B. Hiking	_____	_____	_____	_____
C. Swimming	_____	_____	_____	_____
D. Sight seeing	_____	_____	_____	_____
E. Camping	_____	_____	_____	_____
F. Photography	_____	_____	_____	_____
G. Fishing	_____	_____	_____	_____
H. Floating	_____	_____	_____	_____
I. Other (Please list)	_____	_____	_____	_____

Other Features

A. History of Area	_____	_____	_____	_____
B. Family unity	_____	_____	_____	_____
C. Escape from society	_____	_____	_____	_____
D. Scientific interest	_____	_____	_____	_____
E. Free flowing pure water	_____	_____	_____	_____
F. Other (Please list)	_____	_____	_____	_____

16. Of the above, what was the most enjoyable experience of your trip?

17. Are you a resident of Idaho? Yes ___ No ___

If yes, what town? _____ County _____

If no, what is your state (or Nation) of residence? _____

Age _____ Sex _____ Relation to head of family _____

Occupation _____ Title or Position _____

18. What was the approximate total yearly income of your family in 1968?

Under \$2,999	_____	\$10,000-14,999	_____
3,000-4,999	_____	15,000-19,999	_____
5,000-6,999	_____	20,000-24,999	_____
7,000-9,999	_____	25,000 & over	_____

19. What is the highest level of education you completed?

Grade 0-8	_____	College Graduate	_____
Grade 9-12	_____	Post Graduate Degree	_____
Some College	_____		

20. How many weeks vacation do you have each year? _____
21. Please indicate the category that best describes the location where you presently live, and the population of your metropolitan area.

<u>Location</u>	<u>Population</u>
City center _____	Under 5,000 _____
Suburb of city _____	5,000-10,000 _____
Rural-not on a farm _____	10,000-25,000 _____
Rural-on a farm _____	25,000-100,000 _____
Other(please specify) _____	100,000-1,000,000 _____
	Over 1,000,000 _____

How many years have you resided at that location? _____

22. On your Wild River trip, how much did you pay for:

	<u>From point of origin to jump off point</u>	<u>Jump off point to river</u>
Airline Fares	_____	_____
Bus Fares	_____	_____
Train Fares	_____	_____
Personal Car	_____	_____
Other	_____	_____

How many miles was your family car driven? _____

23. If you traveled as a group in your family car to get to the river, how much of the transportation costs were paid to you by non-family members of the group? _____
24. How much did your family spend for:

	<u>Total</u>	<u>In Idaho</u>
Transportation (gas, repairs, etc.)	\$ _____	\$ _____
Lodging (motels, campground fees, etc)	_____	_____
Food and Beverages	_____	_____
Guide Service	_____	_____
Recreational Supplies (fishing gear, licenses, etc.)	_____	_____
Rental of:		
Boat and motors	_____	_____
Tackle and Gear	_____	_____
Other _____	_____	_____

Interviewer _____ Date _____ Time _____

Location _____

Weather _____ Temperature _____

River Condition _____

Important Comments:

APPENDIX II

