RARE II WILDERNESS ATTRIBUTE RATING SYSTEM

A USER'S MANUAL

Developed by the Wilderness Attribute Rating
System Task Force, November-December 1977

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RARE II WILDERNESS ATTRIBUTE RATING SYSTEM

EXECUTIVE SUMMARY

This report describes a Wilderness Attribute Rating System designed for application to the 1,920 roadless areas inventoried in the RARE II process. The system rates on a seven point scale the four requisite wilderness attributes described in the Wilderness Act. These four requisite attributes are: natural integrity, apparent naturalness, outstanding opportunities for solitude, and primitive recreation. In addition, the system provides for rating four supplemental wilderness attributes: outstanding ecological, geological, scenic, and historical features. They are supplementary because their presence is permissible, but not required by the Wilderness Act. The system also provides for ratings of adjusted natural integrity and adjusted apparent naturalness--ratings that reflect improvement in the natural integrity and apparent naturalness scores if boundaries of the area were adjusted, where possible, to remove serious intrusions.

Each of the wilderness attribute ratings is based on evaluations of pertinent component data. For example, natural integrity ratings are based on impacts of human activity in each area; solitude ratings are based on components such as presence of vegetative and topographic screening, size of area; and so forth. The underlying theory is that compiling as much objective and descriptive data on components of all the wilderness attributes will facilitate consistent ratings of the wilderness attributes by both resource professionals and the public. Professionals are urged to involve the public in applying the system.

The suggested application of the Wilderness Attribute Rating System requires: 1) component evaluations and overall ratings for wilderness attributes, 2) computer processing of wilderness attribute ratings, including a composite rating, to identify the most highly rated roadless areas in terms of wilderness attributes.

RARE II - WILDERNESS ATTRIBUTE RATING SYSTEM

A User's Manual

Background

In the first Roadless Area Review and Evaluation (RARE I), a wilderness quality index was developed based on ratings of scenic value, isolation potential, and variety of available recreational experiences. This wilderness quality index (WQI) was severly criticized for its conceptual and methodological weakness and inconsistent application. However, the W.Q.I. did emerge in RARE I as a major variable used to select "new wilderness study areas".

Because of numerous criticisms of RARE I, use of the wilderness quality index was discontinued for RARE II. However, the need for some means to evaluate the relative wilderness characteristics of the 1,920 inventoried roadless areas was pointed out by reviewers of the proposed RARE II procedures. Thus, on November 8, 1977, a task force was convened to consider the need for, and feasibility of, constructing an improved system for evaluating the relative wilderness characteristics of the roadless areas identified in RARE II.

Improving on the Old Wilderness Quality Index

In developing the concepts and methodology for a rating system to replace that used in RARE I, the task force began by considering criticisms of the RARE I quality index so as to avoid repeating unacceptable approaches. Shortcomings of the RARE I Wilderness Quality Index included: 1/

1. The Index did not emphasize wilderness attributes specifically mentioned in the Wilderness Act, but focused on other factors based on public interest or Forest Service perceptions of quality. The quality criteria were arbitrary and their validity as indicators of wilderness values was not clearly established.

2. The quality index forms were filled out by one individual with no independent judgments by others to see if each evaluation was reliable.

3. More than one attribute was included in a single index factor, such as "spaciousness" and "opportunities for unconfined recreation." Some factors such as "size" were measured twice because it was a factor in more than one variable.

4. Several index items were scored inconsistently with each other, with the result that these evaluations tended to cancel each other out. For example, size was double counted in the evaluation process, but the affects of size were somewhat offset by the division of contiguous roadless

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1/ Milton, W. J. 1973.
A Critique of the Methodology of the Forest Service Roadless Area Inventory Impact Study. Unpublised MS Thesis, University of Montana, 49 pp.

Burke, James and Robert Twiss. 1976.
Quantitive Method in the Wilderness: The Selection of Wilderness Areas by the U.S. Forest Service. Design Method and Theories 10(1): 50-61

Gale, Richard. 1973.
Critique of the RARE I Final Environmental Impact Statement. This 300+ page critique was submitted by the Pac. NW Chapter of the Sierra Club. Dr. Gale, Associate Professor of Sociology, U[illegible]

areas along administrative boundaries and the treatment of these areas as discrete units.

5. Scaled items were inconsistent in that different items often had different maximum and minimum ratings (e.g., some started at 0 and others at 1), the rationale for these differences were not specified, and mid-points were often not defined or were defined differently.

6. There was arbitrary weighting of component variables in the index.

Developing a New Wilderness Attribute Rating System

The issues of validity and reliability, which the RARE I quality index lacked, were viewed as the keys to an improved wilderness rating system.

Validity is the extent to which a rating instrument (e.g., a scale) actually reflects what it is purported to measure. In RARE I, wilderness quality was defined as a weighted product of scenery, recreational opportunity and isolation potential. The rationale for using these, rather than some other criteria, was not clear or logical, and thus the validity of the index was severely criticized. More clearly defined and acceptable criteria are needed for an improved system.

Reliability is the degree to which ratings or judgments by independent coders are consistently similar. Reliability can be facilitated by providing coders with training and explanations of procedures, clear definitions of data or features to be evaluated and how it is to be done (e.g., what is a "high" vs. "moderate" level of impact), and by inter-coder checking to see if different coders are rating the same features in the same way. A new wilderness rating system must have a much higher level of reliability than the RARE I index, both to be more helpful to decision-makers and to gain in-service and public acceptance.

To improve validity, the new rating system does not purport to measure wilderness quality because that is such a subjective concept that can vary from one person to another. Instead, the new system is defined as a Wilderness Attribute Rating System and confines itself to criteria specifically mentioned in the Wilderness Act. To improve reliability, the Wilderness Attribute Rating System emphasizes systematic procedures and the use of as much objective or descriptive data about each area as possible to guide evaluations.

The Wilderness Attribute Rating System calls for ratings of the degree to which each roadless area possesses certain attributes required or mentioned by the Wilderness Act. These wilderness attributes are:

1. Natural Integrity
2. Apparent Naturalness
3. Outstanding Opportunities for Solitude
4. Opportunities for Primitive Recreation
5. Supplementary Attributes which the Act says Wilderness may contain, including outstanding (a) ecological, (b) geological, (c) scenic and (d) cultural features.

The first four are requisite attributes because they are specifically required by the Wilderness Act, while the supplemental attributes are permissable, but not required by the Act. Thus, while the new rating system doesn't purport to measure wilderness quality, it does rate

several requisite and supplementary attributes that are thought by many people to reflect wilderness quality.

The underlying theory used to develop the ratings is the compilation of pertinent component data and descriptions of conditions in individual roadless areas to guide ratings of each attribute. A seven category scale ranging from (1) very low, to (4) moderate, to (7) very high is provided for each attribute based on evaluations of specifically defined components. The rating system deliberately seeks to avoid any reference to terms such as wilderness quality, suitability, qualifying characteristics or any other phrases with decision implications. The system seeks only to produce area ratings for the 4 requisite wilderness attributes and 4 supplementary attributes so it can be displayed for use by decision makers--just as inventory data for other resources such as timber or forage might be compiled and displayed.

Figure 1 - Wilderness Attributes and their Components

Wilderness Attributes	Components on Which Ratings are Based
1. Natural Integrity	Fourteen possible physical developments or human-caused impacts (e.g., roads, railroad rights-of-way, reservoirs, grazing, air pollution, etc.), scaled as to their presence, effect on natural integrity, size of area impacted, potential separability from rest of area, duration of impact if uncorrected, feasibility of correcting.
2. Apparent Naturalness	Uses the same components as natural integrity, but the ratings differ.
3. Outstand Opportunity for Solitude	Size of area, topographic screening, vegetative screening, distance from perimeter to core, human intrusions, scaled as to their degree of impact on opportunity for solitude.
4. Primitive Recreation Opportunities	Size of area, topographic screening, vegetative screening, distance from perimeter to core, diversity, challenge, absence of facilities, scaled as to their degree of impact on primitive recreation.
5. Supplementary Attributes	
a) Ecological	Presence and abundance of endangered or threatened plants and animals or other special ecological features
b) Geological	Presence and abundance of special geological features
c) Scenic	Ratings based on Visual Management System
d) Cultural Features	Presence of any cultural-historical features

Technical Review and Revision of the Attribute Rating System

The basic conceptual framework and method for the Wilderness Attribute Rating System was developed in a one-week session in Washington, D.C. in mid-November. During a second week-long session in early December in Portland, Oregon, the framework was expanded, components for evaluating each attribute were further defined and scaling and coding procedures developed. The proposed system was then submitted to a diverse group of resource managers, researchers, university professors, and environmentalists for technical review and criticism.[2/] Draft copies of the system were mailed to reviewers, their comments solicited by telephone, and the rating system revised according to their suggestions.

The third week in December, nearly 40 National Forest personnel representing every region of the country met in Denver to be trained in the use of the Attribute Rating System and to test it on their selected areas. The system underwent a fourth revision at this point, based on suggestions and comments by these individuals. The enclosed final version was then released to the field for application to the 1,920 inventoried areas, following regional training sessions by the Denver participants.

[2/] Reviewers included: Mr. Don Aldrich, Montana Wildlife Federation, Missoula, Mt; Dr. Keith Argow, Dept. of Forestry, VPI; Dr. Wendell Beardsley, USFS, Missoula, MT; Dr. Bill Burch, School of Forestry and Environmental Studies, Yale University; Dr. Monte Christiansen, Dept. of Parks and Recreation, Penn State University; Dr. Roger N. Clark, USFS, Seattle, Wash.; Professor Roger W. Clark, School of Forestry and Environmental Studies, Yale University; Dr. Gary Elsner, USFS, Berkeley, Calif.; Dr. Jess Grove, Dept. of Recreation and Parks, Clemson University; Mr. Marvin Hoover, retired USFS, Fort Collins, Colo.; Dr. Bob Lucas, USFS, Missoula, MT; Mr. Chuck McConnell, USFS, Denver, Colo.; Mrs. Doris Milner, former President of Montana Wilderness Association, Hamilton, MT; and Mr. Jack Wolfe, USFS, Atlanta, Georgia.

Important Considerations For Application

The acceptance and usefulness of the Wilderness Attribute Rating System will depend on: (1) the strength of its conceptual and methodological framework, the validity of the attributes selected for rating and the components on which these ratings are based; (2) systematic, conscientious and reliable application. Weakness in either area will be fatal. The first area is dealt with through the technical review and progressive development of 4 revisions of the system to its current state by a diverse task force. The second concern rests on the systematic nature of the rating system and training of personnel who will use the system to provide reliability. Several steps to insure reliability have been taken.

First, the procedure is designed to enhance reliability by making attribute ratings based upon objective or descriptive component data. These components are explicit and the individual points on the scales are accompanied by sentence descriptions that should make the ratings fairly reliable. While some of the guidelines call for "best guess" estimates, there is a consistent set of response points for the ratings and all the rating scales are the same for every evaluator.

A major step to insure reliability will be the training sessions for all personnel who will use the system. Individuals will be carefully instructed in all phases of the process. Definitions of the attributes and the manner in which data are to be scaled will be outlined. Coders will also be encouraged to pilot test the system before full application begins.

A final reliability check will be in the eventual review of all the component data and attribute ratings by the public during the summer of 1978. If the component evaluations and the attribute ratings are biased in some systematic way, public review should detect it. Citizens will be provided the full details of using the Wilderness Attribute Rating System and will be encouraged to use it.

Another problem with which raters must cope is maintaining an appropriate level of sensitivity to certain nuances of the attributes. For example, the attributes of apparent naturalness, opportunity for solitude, and primitive recreation call for raters to take a perspective more akin to that of users than of managers. To help do this, we encourage raters to ask the assistance of users with whom they are acquainted as a sort of "perception check" on their own judgments.

Throughout the system, raters are asked to scale the relative occurrence, degree, significance or importance of many components prior to making an overall rating of the related wilderness attribute. Whereas all the attribute scales range from 1 to 7, the component scales on which they are based vary in scale length from 1 to 3 to 1 to 7. The rationale for this variation in the component scales needs to be understood.

The number of items appearing in each component scale reflects the level to which we assumed raters could make reliable and consistent distinctions. Where inadequate data exists or judgments must necessarily be crude, there is little point in forcing responses into a 7-point scale. Rather, a 3-point scale (e.g., high-medium-low) probably suffices; moreover, it probably results in a more reliable level of rating. However, if more precise data is available and can be translated into a large number of meaningful scale descriptors, scale lengths of 5 or 7 points are used. The basic trade-off here is between having standardized scale lengths to avoid confusion (such as if all component scales were 7 points like the attribute scales) compared to varying the length of the component scales to fit the precision with which the data can be evaluated. The component scales have varying lengths to fit the nature of the data because this approach was judged to improve the overall reliability of the system.

Where a roadless area falls in more than one forest or region, each unit shall make a rating and those units shall work together and develop <u>one</u> composite rating that will be used. Forest/Regional coordinators will be responsible to decide which unit will be responsible for the individual area report.

REQUISITE ATTRIBUTE 1, NATURAL INTEGRITY AND REQUISITE ATTRIBUTE 2, APPARENT NATURALNESS

In the words of the Wilderness Act, wilderness is "an area...retaining its primeval character...generally appears...affected primarily by the forces of nature."

Thus, the first two requisite wilderness attributes are "natural integrity" and "apparent naturalness." Each roadless area will be rated according to, (1) the degree to which it retains its primeval natural integrity in a pure ecological sense, and (2) whether it appears natural to most people.

Natural integrity is defined as the extent to which long-term ecological processes are intact and operating. All areas have sustained some level of impact from human activity (global-wide pollution, micro-climatic changes, etc.). The intent here is not to establish some unrealistic rigid notion of purity but to rate the extent to which human influences have altered natural processes away from conditions one might expect had those impacts not occurred. This is not an "either-or" situation; the issue is the degree to which each roadless area reflects varying levels of environmental modification. Stated another way, each roadless area is rated as to the degree it possesses the Requisite Wilderness Attributes of Natural Integrity and Apparent Naturalness. This rating will be based on evaluation of several components of naturalness such as presence of vegetative manipulation, impacts of facilities, and so forth as explained in the following.

Worksheet 1 provides for description and evaluations of selected components of the requisite wilderness attributes of natural integrity and apparent naturalness. These components include all the man-caused influence which may have impacted the primeval natural integrity of a roadless area. Worksheet 1 provides (1) descriptions of possible impacts, (2) which impacts are present or absent, (3) evaluation of the effects on natural processes, (4) how large an area is impacted, (5) potential for separating the impacted portion from the rest of the area, (6) duration of the impact if left uncorrected and (7) feasibility of correcting the impact. Finally, the worksheet calls for evaluation of (8) the overall influence of these component impacts on the natural integrity of the area and (9) the apparent naturalness of the area.

A 7-category scale ranging from "none" to "extreme" is used to rate the impact of the components on the requisite wilderness attributes of natural integrity and apparent naturalness. Those areas with the highest numerical rating are the most natural, since they are the least impacted.

In addition, corrected ratings of natural integrity and apparent naturalness are called for each area, redefined as if some or all of the impacted portions of the area were removed. This corrected rating reflects the potential improvement in an area's natural integrity and apparent naturalness rating through adjustment in boundaries to remove intrusions.

Apparent naturalness is closely related to Requisite Attribute 1, but where that measure is primarily a matter of estimating the magnitude (the measurable extent) of an impact, Requisite Attribute 2 focuses on the importance of those impacts to most visitors.

There is the admitted problem here that managers are usually poor judges of how users or the general public perceives things. There is also the problem that it is unlikely there is such a thing as a "typical" person. "Apparent Naturalness" is a function of knowledge which varies greatly among individuals. Nevertheless, raters should attempt to take the perspective of a non-resource professional in making these judgments. Raters should cross-check themselves on these ratings and, in some cases, may wish to solicit the views of citizens who could help provide the needed perspective.

Apparentness may include impacts which are seen, heard, or smelled. It also should be derived on the assumption that visitors are close enough to at least be potentially aware of it (in other words, the impact isn't hid away where no one will ever see it).

Remember: While we are asking whether or not an impact is apparent, this Attribute is rated on the basis of perceived or apparent naturalness. Thus, if an impact(s) is judged to be highly apparent, the Attribute is rated downward in apparent naturalness.

Definitions of Impacts

Column 1 lists the major categories of impacts to be described. It represents a condensed list, which will facilitate comparison of all areas. As needed, more can be added in an "OTHER" category; however, excessive additions should be avoided.

1. Physical Developments. This includes all constructed facilities or ground modifications, such as:

   a. Road and Railroad. Include, and describe, all routes whether abandoned or not. Include all constructed routes where earthwork and/or surfacing and drainage structures are involved (unimproved roads - see item 12).

   b. Utility Rights-of-Way. Include all energy (electric, gas, oil, slurry, etc.), telephone, water, aquaduct and other linear transmission facilities and developed rights-of-way; or which include routes that have been cleared, graded, or both which either are apparent or require periodic maintenance which will perpetuate this apparentness.

   c. Reservoirs. Self-explanatory. Include constructed range stock ponds.

   d. Watershed Management. Water fluctuation devices, weirs, water level fluctuation of rivers or reservoirs, diversions, monitoring devices, etc.

   e. Special Recreation Facilities. Include developed site facilities, ski trails and facilities, lodges, their utility systems, etc.

f. Other Fixed Site Facilities. Include airports, sawmill sites, helispots, industrial facilities, electronic sites, snow survey stations, bridges, lookout towers, cabins, facilities developed on private lands, and other non-linear facilities.

g. Fences. Both maintained and abandoned.

h. Constructed Trails. Include all that have resulted in any vegetative cover or soil changes. Do not include game trails.

i. Other. Add as needed to subdivide one or more of the above categories or to add new impacts, but attempt to include additions in the above categories when possible (an example might be disposal of wastes or chemicals).

2. Mineral Developments. Include all activities associated with surface or subsurface developments or extraction. Include vegetative, water, and ground impacts, as well as off-site impacts (i.e., tree clearing, acid poisoning of water, acid kill of vegetation or soil pollution, spoil piles, excavations, etc.).

3. Recreation. Include effects of use and management (i.e., trampling or soil compaction or erosion in developed or undeveloped campsites, impacts on soil and vegetation from ORV use, soil loss from hiking, climbing or horse use on or off trails, pollution of water, damage to trees, etc.).

4. Grazing. Include effects of past and current grazing by domestic livestock or pack and saddle stock. (Past soil losses, even though land has revegetated, vegetative changes, active erosion, water pollution, stock driveway problems, hillside terracing by grazing livestock, site deterioration, browsing of vegetation that has long-term effects, etc.).

5. Wildlife Management. Effects on area through management of wildlife, (i.e., over-browsing as a result of predator control; impacts caused by wildlife as a direct result of State season setting, kill restrictions, etc.; effects on non-game or endangered species as a result of management.

6. Vegetative Manipulation. Include purposeful or unintentional changes caused by other than natural factors. Include tree plantations and other purposeful plantings or seedings, timber cutting, wildlife habitat improvement, timber stand improvement, furrowing, use of herbicides, fertilization, prescribed burning, unnatural vegetative changes that have occurred as a result of past management practices. Areas for which an Environmental Anaylsis Report is approved by the Chief for salvage operations will be included if approval is given prior to January 23, 1978.

7. Insect or Disease Control. Identify actions which caused situation to deviate from what would have occurred in a natural condition, and assess what the present impact is of those past practices, whether transitory or long-term.

8. Elimination of Native Plants or Animals or Non-Indigenous Plants or Animals. Include presence of exotic weed species introduced by livestock or its feed, introduced fish and animal species, effects of major plant or animal diseases which have affected naturalness. Do not include those species absent because of natural successional change or those introduced by natural means.

9. Fire History. The extent to which vegetative change (species, age structure, successional stage) has occurred since the introduction of fire control. Areas of low normal fire incidence may not deviate to as great a degree as areas where natural fires were frequent.

10. Air Pollution Effects. Most areas are affected to some degree by intensity, frequency, type and extent of air pollution. (Sources of air pollution are usually outside the roadless area, but impacts of air pollution may be present in the area).

11. Water Pollution. The public often perceives a lack of water pollution in roadless areas, even though technical information indicates that it does exist. Indicate the extent, frequency, type and distribution of the pollution caused by human use, industry, leaching from mined areas, etc.

12. Unimproved Roads. Tracks, ruts, jeep trails, etc., that were created by repeated traverse of the same route.

13. Occupancies. Habitations, cemetaries, etc.

14. Other.

Definition of Evaluative Criteria and Rating Scales

The criteria for appraising the natural integrity attribute are shown in Columns 2-8 of Worksheet 1. Each will be explained separately as well as how the rating scales should be used.

Column 2: Presence: This column documents whether each of the impacts listed in Column 1 is present or absent on the study area regardless of the extent of the impact and its location. If there might be a small impact but the evaluator really is not sure, the scale alternative "Do Not Know" should be checked. However, the evaluator should check with technical experts or persons familiar with the area before an "Absent" or "Do Not Know" answer is marked. Once the "Absent" or "Do Not Know" box is checked in Column 1 for any impact, the evaluator is through with that impact. If the "Present" box is checked, the location of the impact is to be described on the supplemental pages of the worksheet.

Column 3: Effect of Impact on Natural Processes: This column will record the evaluator's perception of the overall influence of each impact (if it was not eliminated in Column 2) on the natural processes of the roadless area. Each impact should be rated in terms of its influence on the natural processes of the impacted area only, and not in terms of the influence on the entire study area. For example, a 500-acre clearcut which drastically impacts within a 200,000 study area would be rated in terms of the impact on the natural processes of only that 500-acre tract; its impact is not to be generalized throughout the entire area. Where there are closely spaced impacts, the intervening areas may also be affected. Questions to be considered in making this rating include: has the impact accelerated or decelerated the rate of natural succession; has the plant species composition

been altered; has the impact altered the animal life of the area; has water or air quality been affected; has it caused soil erosion or compaction; and other questions relevant to natural processes. Using all this information in combination, evaluators should select that response (or scale) alternative in Column 3 which, in their professional judgment, best describes the situation. Is the present effect of the impact on natural process "None", "Low", "Medium", "High", or "Extreme"? Raters should use the categories supplied below. When a situation does not clearly fit the specified categories, raters should use their best professional judgment and clearly explain the basis for their response on a supplementary page for Worksheet 1. When making this rating, it is important that no attention be given to the items that will be considered in Columns 4 through 8. Each of these other evaluations (Columns 4 through 8) will be made separately as a part of the attribute rating system. THIS PROCEDURE MUST BE FOLLOWED WHEN ANY COMPONENT OF ANY ATTRIBUTE IS BEING RATED ON WORKSHEETS 1, 2, 3, or 4. In sum, the current influence on the natural processes of the impacted area should be rated, and that only. A written explanation documenting the bases for the rating should be recorded on the appropriate space on a supplementary page for Worksheet 1.

Effect of Impact on Natural Processes (Column 3)

None	-	Although impact is present, affects on natural process are either non-existent or so minimal as to be insignificant in any ecological sense
Low	-	Impact is present and measurable but only minor significance. Processes continue to operate largely uninterrupted
Medium	-	Impact has some significant affect, with natural processes disturbed to some extent
High	-	Impacts are significant with natural processes interrupted to a signigicant degree
Extreme	-	Impacts are very significant, natural processes either completely disrupted

Column 4: Area on Which Natural Integrity is Impacted: This column records by decile group the percentage this impacted acreage represents of the total roadless area. In making this evaluation, remember that this percentage is to be determined only in terms of the impact on the natural integrity of the area and in terms of the area actually impacted in that manner. Rate the impacted area according to the following categories:

Nil - Less than 1 percent of area affected
1 - 1-10 percent of the area
2 - 11-20 percent of the area
3 - 21-30 percent of the area
4 - 31-40 percent of the area
5 - 41-50 percent of the area
6 - 51-60 percent of the area
7 - 61-70 percent of the area
8 - 71-80 percent of the area
9 - 81-90 percent of the area
10 - 91-100 percent of the area

Column 5: Separability of Impacted Area from Whole Area: This column designates (yes or no) whether the impacted area could be physically separated from the roadless area and have the area still remain a viable candidate area as defined in the inventory instructions. Special attention, therefore, needs to be given to the location and significance of each impact within the study area. Impacted areas in the center will be more difficult to separate than those on the periphery. Linear-type impacts (e.g., old roads) would be more difficult to separate than a concentrated impact, such as an old logging sale. Each impact will be considered separately and then a composite-overall significance rating will be made on Row A for all impacts taken together. For each rating, a written explanation must be provided on Page 2 of the supplememtary worksheet pages to document the bases for each decision. If the "yes" box is checked for Column 5 on Row A of the worksheet to indicate overall separability, a single map showing the location and extent of the impacts and the non-excluded area should be stapled to Worksheet 1. In order to apply this concept of separability, careful judgment must be used to avoid an attempt at gerrymandering all such impacts out of the area. It is emphasized that location and significance must be the determinants.

Column 6: Duration of Impact, if Uncorrected: In this column, evaluators will record their judgment of the time period over which the impact will last if no corrective actions are taken. Use the time period categories given in Column 6. Write an explanation for each rating in the space provided on the Worksheet 1 supplementary pages.

Column 7: Feasibility of Correcting: In this column, professional judgment will be used to rate the feasibility of correcting all but minimal levels of the impact through management actions or natural processes. The key issue here is whether or not the natural ecological processes have been restored. For example, a naturally-reclaimed roadbed might still show evidence of cut-and-fill activity, but the natural processes originally disturbed by the action could have been recovered. This rating will be influenced by considerations of: costs, time and technology. All relevant factors, in combination, should be used when making the rating. Use the rating scale and descriptors provided below. Write an explanation on the supplementary page for Worksheet 1 for a rating that does not follow the category descriptors supplied below:

	Feasibility of Correcting (Column 7)
None	Impacts are virtually irreversible, given any reasonable constraint of time, money or technology
A little	Impacts correctable only with concerted application of time, money or technology. Chance of successful correction is low.
Moderate	Impacts correctable with moderate investment of time, money or technology. Chance of successful correction is good with appropriate investment.
High	Impacts correctable with only limited investment of either time, money or technology. Chance of correction very good.
Very high	Impacts easily correctable, even with no investment. Chance of correction excellent.

Column 8: Overall Influence on Natural Integrity: This is a summary column in which all of the information considered in Columns 2-7 are combined for one rating for each impact. One rating will be made for Physical Developments that summarized Column 2-7 ratings for elements a-i. The exception is that the rating made in Column 5 is ignored. These Column 8 ratings should be made separately for each impact as they influence the natural integrity of the entire roadless area. Use the rating categories and descriptors below as guides. Explain a different basis for any rating on the supplementary pages of the Worksheet.

Influence on Natural Integrity (Column 8)

None	-	Effects on natural processes, none or low only. Generally less than 15 percent of area impacted. Duration of impact usually less than 5 years with high or very high feasibility for correction.
Very low	-	Effects on natural processes low. Generally less than 15 percent of area impacted. Duration of impact usually less than 5 years but may be up to 10 years, with high feasibility of correcting.
Low	-	Effects on natural processes, low or medium. Generally less than 25 percent of area impacted. Duration of impact usually 5-10 years with high or moderate feasibility of correcting.
Moderate	-	Effects on natural processes medium. Generally between 25 and 50 percent of area impacted. Duration of impact between 5 and 10 years, with moderate feasibility of correcting.
High	-	Effects on natural processes medium to high. Generally over half the area impacted. Duration of impact over 10 years, with moderate to a little feasibility of correcting.
Very high	-	Effects on natural processes high. Between 50 and 75 percent of the area impacted. Duration of impact usually 10 years or more, with feasibility of correcting only a little or none.
Extreme	-	Effects on natural processes high to extreme. Often 75 percent of area impacted. Duration of impact in excess of 10 years, with little or no feasibility of correcting.

After the Column 8 ratings are made, a composite-overall rating will be made on Row A for the entire area. Use the ratings and descriptors shown below for the overall rating of Natural Integrity; if another basis for a rating is used, provide an explanation on the Worksheet. If, and only if, a "Yes" appears on Row A for Column 5, an additional Column 8 rating will be made. That rating, which appears in Row B, rates the overall influence of all impacts on the natural integrity of the area that remains after all separable impacted areas have been removed from consideration. These separated impacted areas will not be considered in this rating. This final rating for the remaining area should be explained at the bottom of Page 2 of the worksheet.

Overall Natural Integrity (Row A/B)

1 = All impact ratings are extreme, very high, or high

2 = All impact ratings are very high or high, none are extreme

3 = All impact ratings are high or moderate

4 = Most impact ratings moderate, with no more than one rated either low or high

5 = All impact ratings low or moderate

6 = All impact ratings low or very low, none are none

7 = All impact ratings low, very low, or none

Column 9: Overall Influence on Apparent Naturalness: The second requisite attribute, Apparent Naturalness (Column 9), provides a measure of the degree to which the impacts documented in Attribute 1, Natural Integrity, are apparent to most visitors. For example, even though the entire roadless area has been affected by fire exclusion (resulting in successional changes, etc.), it is likely that few visitors would be aware of this impact. On the other hand, a spoil bank might be highly apparent.

To rate Apparent Naturalness, it is necessary that the evaluator take the perspective of an "average" visitor in terms of technical ecological knowledge. Each of the 14 impacts should be rated according to how apparent they would be to most visitors. Rate only the apparentness to visitors to the impacted area, not to visitors who never come close to the impacted area.

After the apparentness ratings have been made for each impact, make an overall rating for how apparently natural the entire roadless area is to most visitors; use Column 9, Row A. Use the overall rating scale and descriptors provided below. Provide a brief explanation of this rating on the supplementary pages of Worksheet 1. If there is a "yes" in Column 5, Row A, provide an overall apparent naturalness rating for the redefined area (roadless area minus impacted areas) in Column 9, Row B. Write a brief explanation of this rating on the supplementary pages of Worksheet 1. If there is a "No" in Column 5, Row A, go on to Attribute 3.

Apparent Naturalness (Row A/B)

1 = Roadless area is obviously impacted in many sections, with the impacts readily apparent to virtually all visitors, regardless of knowledge.

2 = Roadless area contains impacts apparent to all but a few. Disruption is apparent in sight, sounds, or smells.

3 = Roadless area apparently unnatural to most people, but evidence of unnaturalness usually restricted to one of the senses.

4 = Roadless area is viewed as natural by many visitors, but unnatural impacts apparent to many others nevertheless. Apparentness usually only in terms of either sight, sound, or smell.

5 = Roadless area apparently natural to most visitors but there are some impacts (sight, sound, or smell) apparent to some visitors.

6 = Roadless area apparently natural to most visitors, only limited clues of unnaturalness.

7 = Most visitors find roadless area apparently natural. Evidence of unnaturalness either absent or apparent only to the most knowledgeable.

Summary of Instructions for Worksheet 1

Basically, the tasks of the evaluator are:

1. Complete the descriptive information about the area at the top of the pages of Worksheet 1.
2. Rate each impact in Column 1 according to the Column 2 criterion.
3. For each impact checked "Present" in Column 2, either write in the required information and/or check the most appropriate box under Columns 3-8. Specify the location of each impact on the supplemental pages for Worksheet 1.
4. Forget about Column 9 until all ratings for the Natural Integrity Attribute have been made.
5. Explain and document in writing (on the supplemental sheets provided) the basis of the ratings made in Columns 3, 5, 6, 7 and 8 for each impact listed.
6. Make composite-overall rating for Columns 5 and 8 on Row A.
7. If response to Column 5 on Row A is "Yes," make rating for Column 8 on Row B.
8. Explain and document in writing (on Page 2 of the Worksheet) the bases of the ratings made for Column 5 (if "Yes," only) and for Column 8. Do the same for Column 8 on Row B if relevant and prepare map required.
9. Make ratings and explanations for Requisite Attribute 2 as instructed in preceding section.
10. Check to see that all necessary ratings or information were provided.
11. Transfer the necessary ratings from Worksheet 1 to Worksheet 4. This would include the rating for overall natural integrity (Column 8, Row A), natural integrity of the adjusted area (Column 8, Row B), overall apparent naturalness (Column 9, Row A), and apparent naturalness of the adjusted area (Column 9, Row B).
12. Make photocopies of all data pages for office files.
13. Staple all information relevant to a particular area together.

WORKSHEET 1: FOR RATING INFLUENCE OF IMPACTS ON THE NATURAL INTEGRITY OF POTENTIAL WILDERNESS RESOURCES AND APPARENT NATURALNESS

Name of Area:_____ Code:_____ Region:_____ Forest:_____ Acreage:_____ Evaluators_____ Date:_____

Col. 1	Col. 2			Col. 3					Col. 4	Col. 5		Col. 6			Col. 7					Col. 8							Col. 9						
	Presence			Effect of Impact on Natural Process					Area on Which Integrity is Impacted	Separability of Impacted Area from Whole Area-		Duration of Impact, if Uncorrected (years)			Feasibility of Correcting					Overall Influence on Natural Integrity							Overall Influence on Apparent Naturalness						
SPECIFIC IMPACT (or cause of impact)	Absent	Present	Do not know	None	Low	Medium	High	Extreme	% of Total	Yes	No	0-5	6-10	>10	None	A Little	Moderate	High	Very High	None	Very Low	Low	Moderate	High	Very High	Extreme	Is not	Very Low	Low	Moderate	High	Very High	Extreme
IMPACT MEASUREMENT																																
1. Physical Developments																																
a. Road and Railroad																																
b. Utility ROW																																
c. Reservoirs																																
d. Watershed management																																
e. Special Recreation Facilities																																
f. Other Fixed site facilities																																
g. Fences																																
h. Trails																																
i. Other																																
2. Mineral Developments																																
3. Recreation																																
4. Grazing																																
5. Wildlife Management																																
6. Vegetative Manipulation																																
7. Insect or Disease Control																																
8. Non-indigenous Plants & Animals																																
9. Fire History																																
10. Air Pollution Effects																																
11. Water Pollution																																
12. Unimproved Roads																																
13. Occupancies																																
14. Other																																

OVERALL RATING	Separability														
A. Overall rating for entire area								7	6	5	4	3	2	1	7	6	5	4	3	2	1
B. Overall rating for area redefined after some/all of impacted areas are separated (see map).								7	6	5	4	3	2	1	7	6	5	4	3	2	1

EXPLANATIONS OF RATINGS MADE FOR SPECIFIC IMPACTS

Name of Area _____
Evaluators _____

Impact: _____

Col. 2 - Location

Col. 3

Col. 5

Col. 6

Col. 7

Col. 8

Col. 9

Impact: _____

Col. 2 - Location

Col. 3

Col. 5

Col. 6

Col. 7

Col. 8

Col. 9

A 92

NAME OF AREA_____

EVALUATORS_____

EXPLANATION OF OVERALL RATINGS

For Entire Area

For Col. 5 Rating

For Col. 8 Rating

For Col. 9 Rating

For Redefined Area

For Col. 8 Rating

For Col. 9 Rating

REQUISITE ATTRIBUTE 3: OUTSTANDING OPPORTUNITIES FOR SOLITUDE [1/]

The Wilderness Act states that a wilderness "...has outstanding opportunities for solitude..." Elsewhere in the Act are other references to solitude as an important attribute of wilderness. Several studies of wilderness users further indicates the importance of solitude. Thus, opportunity for solitude is a requisite attribute of wilderness.

Solitude is defined as being isolated from the sights, sounds, and presence of others and from the developments and evidence of man. Solitude is a psychological state that varies from one individual to another - what is a crowd to one person may be solitude to another. However, the issue is not one of defining the relative human density levels of each area, that can be changed by management. Instead, the rating system focuses on those intrinsic features of the roadless areas that offer users outstanding opportunities for solitude--size of the area, presence of vegetation, topographic screening, and so forth.

Features such as trails, trail heads, numbers of campsites and their distribution are not included. Such features can affect opportunities for solitude but, like human density, their impact on solitude is a function of management (e.g., by future closing or opening trails or campsites, controlling use, etc.). Instead, the components for evaluating the requisite

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1/ The specific wording of the Wilderness Act calls for "...outstanding opportunities for solitude or a primitive and unconfined type of recreation." We consider this to represent two distinct, yet related, attributes of the wilderness resource. In some areas, both attributes may be readily available while in others solitude is difficult to find but primitive recreation opportunities are abundant. The interpretation is that the attributes are not a matter of "either-or", but the relative degree to which each is present.

wilderness attribute "outstanding opportunity for solitude," as called for in Worksheet 2, are: size, presence of topographic screening, vegetative screening, distance from the perimeter of the area to its core, and degree of permanent off-site intrusions. Based on evaluations of the impact of these components, an overall seven-category rating is assigned to each area's potential to provide "outstanding opportunities for solitude." The seven rating categories range from "none" to "outstanding."

Definitions of Components and Rating Scales

Worksheet 2 shall be used to rate Requisite Attribute 3, Outstanding Opportunities for Solitude. It will also be used to rate Requisite Attribute 4, the Opportunity for Primitive Recreation. We will return to Attribute 4 shortly.

In Worksheet 2, the components are listed down the left-hand column. Each row represents one component for either Solitude or Primitive Recreation, with the exception of the first four criteria (size, topographic screening, vegetative screening and distance from perimeter to core) which are rated for both solitude and primitive recreation.

The components and their associated rating scales are described below. To use the rating scales, circle the appropriate response alternative that most accurately de-cribes the component being rated. Ignore those spaces on Worksheet 2 that have been blocked out.

After all the criteria have been rated for the Solitude Attribute, make an overall rating of the entire roadless area on the 7-point scale at the bottom of page 1 on Worksheet 2. IMPORTANT: If your overall rating is inconsistent with the ratings for the individual components, provide an explanation of the basis for your rating. For example, if you feel an area has "outstanding" opportunity for solitude and most of the component ratings are "moderate" or "low" ratings, explain your reasoning.

There are several components of the solitude attribute, including topographic screening, vegetative screening, distance from perimeter to core, and permanent off-site intrusions perceived from area.

1. Size: Size of a roadless area when considered by itself is an inadequate measure of potential for solitude or primitive recreation. However, in combination with the other criteria, it is an important component of an area's overall potential. Moreover, with all else equal, a large area has more potential for solitude than a small one.

Small Rare II areas, such as those frequently found in the east, may be discriminated against; i.e., they may be rated as having low potential for solitude if the same categories for size classes were used across all Regions to evaulate an area's potential for solitude. Therefore, each Region will establish it's own size class categories for this component. This will be done by analyzing the acreage values of each of the Rare II areas and present Wilderness areas in each Region and then segregating the data into quartile ranges.

Size is measured as the gross acreage of the roadless area. The gross acreage of a roadless area contiguous to an existing Wilderness, Primitive Area, or Inventoried Roadless Area, is the total of the roadless area plus the established area.

			Acres: R-1
(Upper Quartile)	-	High potential	0 - 9,999
(Upper Middle Quartile)	-	Moderate potential	10,000 - 29,999
(Lower Middle Quartile)	-	Low potential	30,000 - 79,999
(Lower Quartile)	-	Very low potential	80,000 +

2. Topographic Screening: This component represents the extent to which topographic screening offers opportunities for solitude. The assumption is that diverse relative relief in the roadless area enhances opportunities for solitude by increasing opportunities for screening (by reducing extent of vision). However, in some cases excessively steep slopes can act to concentrate use in a few areas (travel corridors, lake shores). Inter-party visibility in such conditions could be very high. It is rated according to the following:

High	Roadless area contains a diversity of highly dissected topography that easily screens people from one another within short distances
Moderate	Diversity of topography offers screening potential in at least half the area, may be limited or lacking in remainder.
Little	Rolling-type terrain, limited diversity of topography offers limited screening potential.
Minimal/None	Flat terrain, virtually no relief for screening, or, topographic variation is so great that visitors are concentrated into small areas where inter-party visibility would be high.

3. Vegetative Screening: This component represents the collective vegetative cover that offers opportunities for screening of parties from one another. In areas where vegetative cover is heavy, the sights of other people is reduced.

However, in some cases, excessively dense vegetation can act to concentrate use in those areas where openings for travel and camping are possible. Inter-party visibility in such conditions could be very high.

Dense	Most of the roadless area has dense vegetation, which screens people from one another, even within a quarter mile, but there is still sufficient opening to permit travel and camping without undue concentration.
Moderate	Vegetative screening is good in at least half the area, screening people easily within a quarter mile of one another; limited or no screening available in remainder.
Little	Less then a quarter of the roadless area offers vegetative screening; or, vegetation is so dense that it concentrates use in a limited area, increasing inter-party visibility.
Minimum/None	Open, virtually no vegetative screening throughout the area, or, vegetative screening is so great that visitors are concentrated into small areas where inter-party visibility would be high.

4. Distance from Perimeter to Area Core: The distance from the perimeter of the roadless area to the core or approximate geographic center is a measure of the potential for solitude and for escape from the evidence of man. Measurement should be from the approximate center of the area to the nearest point along the boundary. If the roadless area is contiguous to an existing Wilderness or Primitive Area or to another roadless area, the entire roadless tract should be used to compute this rating. Use the following scale:

Low potential	Less than 1 mile from core to perimeter.
Moderate potential	From 1 to 3 miles from core to perimeter.
High potential	From 3 to 5 miles from core to perimeter.
Outstanding potential	In excess of 5 miles from core to perimeter.

5. Permanent Off-site Intrusions: This includes off-site evidence of man's activities likely to be seen, heard or smelled by visitors from within an area such as transportation corridors. Aircraft, timber harvest operations, industrial development, mines, lights from a nearby city at night, reservoirs, ski areas, etc.

Minimal/None	Generally no off-site intrusions perceptible to visitors from within the entire area.
Some	Off-site intrusions perceptible, but relatively distant and generally not permanent. Some off-site intrusions are close-by, but generally not permanent.
Many	Off-site intrusions are close-by and permanent.

6. Overall Rating of Solitude Opportunity: To determine the overall rating of solitude opportunity, examine the ratings given each component. Use the categories and descriptors outlined below. REMEMBER: If your overall rating for solitude departs from the guidelines presented below, use the second page of Worksheet 2 to explain your rating.

No opportunity	All five components rated in bottom category.
Very low opportunity	Three components rated in bottom category, remainder rated only one scale position better.
Low opportunity	Two components rated in bottom category, none rated in top category.
Moderate opportunity	No components rated in bottom category, none in top category.
High opportunity	Two components in top category, none in bottom category.
Very high opportunity	Three components in top category, remainder no more than one scale position away.
Outstanding opportunity	All five components rated in top category.

REQUISITE ATTRIBUTE 4: PRIMITIVE RECREATION OPPORTUNITY

The Wilderness Act states that wilderness "...has outstanding opportunities for...a primitive and unconfined type of recreation." Further definition is given to this kind of recreation by other wording in the Act prohibiting permanent improvements, motorized activity, human habitation, and other implied restrictions to protect the wilderness character of the area. Many of the recreation activities that take place in wilderness also occur in other areas, but wilderness conditions greatly enhance some of these activities for many users. Some of the characteristic primitive-type wilderness recreation activities are hiking, camping, fishing, hunting, cross-country skiing, winter camping and nature study.

Primitive recreation opportunity can be defined in terms of the types of experiences it makes possible for users. Not all of the specific experiences need to be present at one time to have primitive recreation. The working definition which guides rating this attribute is:

> Primitive recreation is that which provides opportunities for isolation from the evidence of man, a vastness of scale, feeling a part of the natural environment, having a high degree of challenge and risk, and using outdoor skills. It is characterized by meeting nature on its own terms, without comfort and convenience facilities.

Ratings of the Requisite Wilderness Attribute 4, primitive recreation opportunity, is based on some of the same components as used for solitude, plus some others. The components also used to rate solitude are size of area, topographic screening, vegetative screening and distance from perimeter to core. The added components to rate primitive recreation are diversity of opportunity, challenge (hazardous things like dangerous animals and cliffs), and absence of man-made facilities.

As with the other wilderness attributes, evaluations of the components are used to derive an overall 7 category rating for primitive recreation opportunity ranging from "none" to "outstanding."

Definition of Evaluative Criteria and Rating Scales

Procedures for rating this attribute follow those used for Requisite Attribute 3, Outstanding Opportunities for Solitude. REMEMBER: the first 4 criteria used for the Solitude Attribute will be used again here, as indicated on the right-hand side of Worksheet 2. The criteria and rating scales are:

1-4. Size, topographic screening, vegetative screening, and distance from perimeter to core: Use the same ratings and descriptors as those presented in the discussion of Attribute 3.

5. Diversity: Diversity of vegetation, fish and wildlife, terrain, lakes and streams, and climate improves opportunities for a larger variety of primitive recreation activities. The response scale for this component is:

Very Diverse	Roadless area has much diversity in nearly all above categories.
Moderate	Roadless area has only some diversity in above categories, or no diversity in some but much in others.
Little Diversity	Roadless area mostly homogeneous in nearly all of above categories.

6. Challenge: The challenge component is measured as the number and extent of challenging features such as dangerous animals, climatic disturbance,

avalanche potential, terrain features (cliffs, quicksand, sink holes), fast-moving water, glaciers, and a lack of dominant visual features on which to orient oneself. What constitutes a hazard is a function of knowledge and experience, but the definition rests on a common sense definition of those features that are commonly considered hazardous by most visitors. This is important in order to indicate the degree to which an area has potential to produce opportunities for challenge and risk-taking as part of the primitive recreational experience. The response scale for this component is:

Rare	Features commonly considered hazardous seldom encountered or only a few scattered parts of the roadless area.
Few	Features commonly considered hazardous encountered in area.
Many	Features commonly considered hazardous encountered throughout area.

7. Absence of Recreation Facilities: The absence of facilities component denote a freedom from man's developments which is important in affording opportunities to develop and test outdoor skills and to be free of the evidence of man. It is measured by the quantity and distribution of facilities like trails, bridges, and camp facilities. The response scale for this component is:

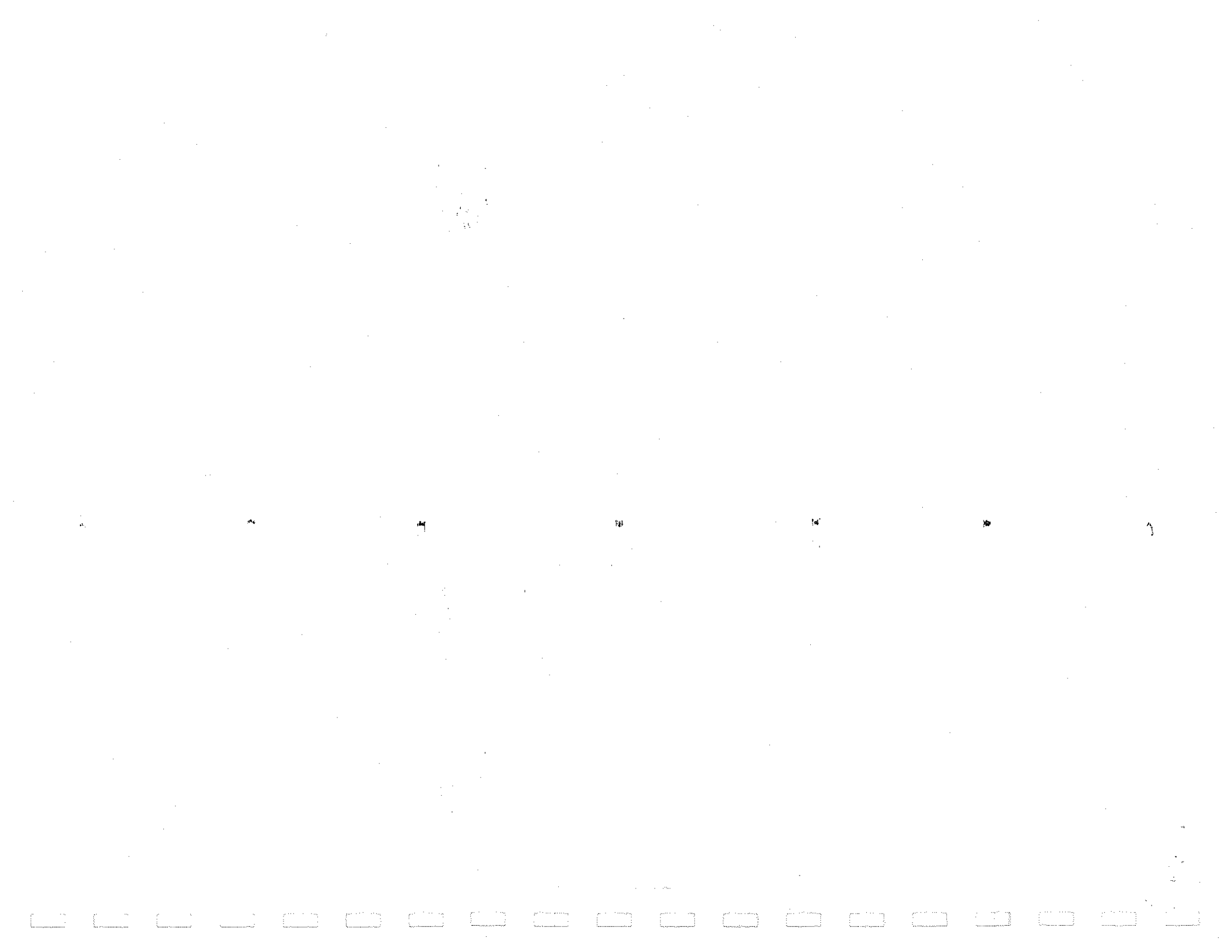
Highly developed	High standard trails, bridges over all streams, even small ones, highly developed campsites.
Moderate development	Trails, at least some built to high standards, bridges over most streams, campsites moderately developed (fire rings, fireplaces, toilets, tables, water, pumps, etc.).

Limited development	Mostly low standard trails, few bridges over large streams, very simple, limited campsite facilities (fire rings, some pit toilets, etc.).
Minimal/None	Either no or very few recreation facilities in area; low standard trails, logs over-streams, etc.

8. Overall Rating of Primitive Recreation Opportunity: To determine the overall rating of primitive recreation opportunity examine the ratings given each component. (Rating values for primitive recreation increase from left to right). Use the categories and descriptors outlined below. REMEMBER: If your overall rating for primitive recreation departs from the guidelines presented below, use the second page of Worksheet 2 to explain your rating.

No opportunity	All seven components rated in bottom category.
Very low opportunity	Five components rated in bottom category, remainder rated only one scale position better.
Low opportunity	Three components rated in bottom category, none rated in top category.
Moderate opportunity	No component rated in bottom category, none in top category.
High opportunity	Three components rated in top category, none in bottom category.
Very high opportunity	Five components rated in top category, remainder rated only one scale position away.
Outstanding opportunity	All seven criteria rated in top category.

When the ratings for Attributes 3 and 4 have been completed, code the overall ratings for Solitude and Primitive Recreation onto Worksheet 4.



WORKSHEET 2: FOR RATING OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE RECREATION

Name of Area:_____ Code:_____ Region:_____ Forest:_____ Acreage:_____ Evaluators:_____ Date:_____

Components of Attribute	Opportunity for Solitude					Opportunity for Primitive Recreation				
Size (acres)	Very Low Potential	Low Potential	Moderate Potential	High Potential		Very Low Potential	Low Potential	Moderate Potential	High Potential	
Topographic Screening	Minimal/ None	Little	Moderate	High		Minimal/ None	Little	Moderate	High	
Vegetative Screening	Minimal/ None	Little	Moderate	Dense		Minimal/ None	Little	Moderate	Dense	
Distance From Perimeter to Core	Low	Moderate	High	Out-standing		Low	Moderate	High	Out-standing	
Permanent, off-site intrusions	Many		Some		None					
Diversity of opportunity						Little Diversity		Moderate		Very Diverse
Challenge						Rare		Few		Many
Absence of Facilities						Highly developed	Moderate develp'mt	Limited develp'mt	Minimal/ None	

Overall Rating	Opportunity for Solitude							Opportunity for Primitive Recreation						
	None	Very Low	Low	Moderate	High	Very High	Out-standing	None	Very Low	Low	Moderate	High	Very High	Out-standing
	1	2	3	4	5	6	7	1	2	3	4	5	6	7

Name of Area: _____ Evaluators: _____

Attribute	Components of Attribute	Explanation
Solitude	Topographical Screening	
	Vegetative Screening	
	Distance from Perimeter to Core	
	Permanent Off-Site Intrusions	
	Overall Rating	

Name of Area: _____ Evaluators: _____

Attribute	Components of Attribute	Explanation
Primitive Recreation	Topographic Screening	
	Vegetative Screening	
	Distance from Perimeter to Area Core	
	Diversity	
	Challenge	
	Absence of Facilities	
	Overall Rating	

SUPPLEMENTARY WILDERNESS ATTRIBUTES-
INSTRUCTIONS FOR RATINGS

Section 2(c)(4) of the Wilderness Act indicates that an area ". . . may also contain ecological, geological, or other features of scientific, educational, scenic or historical value." This seems to imply that such features, though not necessary, do enhance wilderness quality if they exist to any "extraordinary" degree. Consequently, a supplemental attribute rating (1-5) is provided based on components of ecological, geological, scenic and cultural features, i.e. their presence and estimated abundance or importance. The supplementary attribute rating may be useful in helping make marginal decisions. The identification of supplementary features with significant values in a roadless area may also lead to a recommendation for the specific site to be included in the Special Interest Areas system, (scenic areas, botanical areas, historical areas, etc.), rather than being included in the Wilderness system. At the very least, the supplementary attribute rating will alert decisionmakers to the existence of "special" ecological, geological, scenic or cultural values within a roadless area.

A. Ecological

Analysis of outstanding ecological features includes identification of Endangered or Threatened plant and animal species present as well as other special features which may be present. Such features often will have important scientific and educational values associated with them.

For Endangered or Threatened species, the location, extent and population condition should be described briefly on Worksheet 3.

Other special ecological features present in the area could include unusual plant or animal communities associated with unique land features such as swamps, lava flows, caves, etc. They might include unusual relationships between two more species that may not occur under other circumstances. Special ecological conditions might also include communities or species that occur well outside the range normal to that community or species.

Each of these special features should be described by nature, location, and extent in the roadless area; the descriptor found at the bottom of the worksheet should then be selected that best describes the occurrence of the feature outside the roadless area. If more than one such feature exists, the rating of the feature that is most unique or rare would be the rating for the area.

B. Geological

Special geological features are landforms that, in the judgment of a qualified person, represent significant examples of geologic processes such as natural bridges, mass movement areas, caves, lava flows, etc. Such features should be described in nature, location, and extent in the area on Worksheet 3. The statement should then be chosen that best describes the occurrence of the feature within the physiographic province in which it lies. If more than one such feature exists, the feature that is most rare or unique will determine the rating for the area.

C. Scenic Values

Analysis of scenic values will follow the system process for determining variety classes as prescribed in The Visual Management System[1/] (VMS) and should be performed by individuals trained in VMS.

1/USDA Forest Service, 1974. National Forest Landscape Management, Vol. 2: Chapter 1, The Visual Management System. Agriculture Handbook 462, 47pp.

For the purpose of the RARE II study, only Variety Classes will be determined. The percentage distribution of variety classes A, B, and C will determine the rating for the roadless area.

This analysis is intended to produce one rating based on the following assumptions:

1. Scenic quality for the roadless area is related to the degree of variety within the given character type.

2. Foreground and middleground views (up to 5 miles) of the scenic resource outside the roadless area may affect evaluation of the rating for the roadless area.

Steps in rating scenic values are as follows:

1. Define and describe the character type of which the roadless area is a part to establish the frame of reference from which variety classes are determined.

2. Preferably, regions should develop a variety class determination chart for each character type and/or subtype in which roadless areas are found. If character type and variety class determination charts have not been developed and described for the areas being evaluated, the variety class chart in exhibit 1 should be used to map variety classes.

3. Map variety classes within the roadless area and determine rough percentages for variety classes A, B, and C.

4. Identify and map areas of distinctive variety within 5 miles of the roadless area which can be seen from within the roadless area to alert the decisionmaker to the existence of these outstanding values.

5. Considering the percentage distribution for variety class composition within the roadless area, use the following chart to determine

the rating which most closely approximates the conditions for the area.

SCENIC VALUES

Rating	% Distribution of Variety Classes
Insignificant	A 10% B 25% C 65%
Infrequent	A 10% B 40% C 50%
Significant	A 25% B 50% C 25%
Outstanding	A 50% B 40% C 10%
Unique	A 65% B 25% C 10%

	Class A Distinctive	Class B Common	Class C Minimal
Landform	High relief for region. Diverse relief, outstanding landform features.	Relief moderately common within region and only moderately diverse in roadless area.	Little variety, no dominant features, no diversity.
Rock Form	Features stand out in landform. Unusual or outstanding avalanche chutes, talus slopes, outcrops, etc., in size, shape & location.	Features obvious but do not stand out. Common but not outstanding avalanche chutes, talus slopes, boulders and rock outcrops.	Small to nonexistent features. No avalanche chutes, talus slopes, boulders and rock outcrops.
Vegetation	High degree of pattern in vegetation. Vegetative diversity significant throughout area, unusual plants	Continuous vegetation, limited diversity. Most species common in region.	Highly uniform vegetative cover. Species very common.
Water Forms Lakes (include intermittent)	Unique lake features compared to region. Diversity of shape, irregular shorelines. Aggregate acreage of lakes more important than size of any individual lake.	Lake features fairly common in region. Some shoreline irregularity.	No evidence of water-related features.
Water Forms Streams	Numerous or unusual flow characteristics.	Common flow characteristics with region.	Little or no flow apparent, year-round or intermittent.

D. Cultural Features

Cultural resources comprise all evidence of historic and prehistoric human use of an area. Many of these resources--campsites, petroglyphs, pictographs, vision questing sites, and trails, as well as historic sites exemplifying the development of an area such as pioneer homesteads, evidence of early logging or mining activity, and trade or military routes or roads, may require special management consideration. Cultural features will often have educational, scientific, and historical values associated with them.

Indicate existence of any recorded historic sites and briefly describe their nature and location on Worksheet 3. NOTE: There is no rating of significance of these features; their presence and location is all that is recorded.

Overall Supplementary Value Rating

On Part II of Worksheet 3, make an overall rating of the supplementary values of the roadless area. Provide an explanation for your rating in the space provided. Use the guidelines below to make your rating:

Insignificant = Area contains only common features; no cultural features or endangered or threatened species present.

Infrequent = Area contains generally fairly common features; cultural features, or endangered or threatened species may be present.

Significant = Area contains one feature of infrequent occurrence in the region; may contain cultural features, or endangered or threatened species.

Outstanding = Area contains two features of infrequent or rare occurrence in the region; may contain cultural features, or endangered or threatened species.

Unique = Area contains at least three features of rare or unique occurrence; may contain cultural features, or endangered or threatened species.

Transfer the overall rating for the supplemental attribute to Worksheet 4.

WORKSHEET 3: FOR RATING SUPPLEMENTARY ATTRIBUTES

Area:_____ Code:_____ Forest:_____ Evaluators:_____ Date:_____

PART I

	Attribute	IBM Card Number	Presence: Present	Presence: Absent	Presence: Unknown	Overall Rating for Entire Area 1/: Insignificant (1)	Infrequent (2)	Significant (3)	Outstanding (4)	Unique (5)	Description of location, significance and extent of attribute in area
1. ECOLOGICAL	a. Endangered or threatened species of animals or insects					X	X	X	X	X	
	b. Endangered or threatened species of plants					X	X	X	X	X	
	c. Special ecological features										
2. Special geological features											
3. Scenic values			X	X	X						
4. Cultural features						X	X	X	X	X	

PART II

	Put X in appropriate box: Unique	Outstanding	Significant	Infrequent	Insignificant	Explanation
1. Overall rating for supplementary value	5	4	3	2	1	

1/ Explanation of rating scale:
Insignificant = Present throughout the physiographic province
Infrequent = Often found in the province
Significant = Infrequently found in the province
Outstanding = Not found elsewhere in the province.
Unique = One of very few known occurrences

USING THE WILDERNESS ATTRIBUTE DATA

All of the wilderness attribute data worksheets and accompanying data sheets will be retained at the Forest Supervisor's office, but a complete copy of all the sheets for each area (with all sheets clearly labeled) will be sent to the Regional Office. This is important so the information will be available for use by decision makers and inspection by the public. In addition the Wilderness Attribute Rating Summary sheet (worksheet 4) will be filled out for each area to expedite processing of the data.

All of the Attribute ratings and component evaluations for each area will be keypunched directly from the 3 worksheets onto IBM cards and will also be stored on tape. Ten attribute rating scores will be recorded or calculated as follows (A 1 rating is lowest for all scores).

N (1.) Natural Integrity Rating, 1-7: The overall rating of each areas natural integrity based on the evaluations of the up to 14 components that were considered (worksheet 1).

AN (2.) Apparent Naturalness Rating, 1-7: The overall rating of each areas apparent naturalness based on evaluation of the perceptible impact of the same 14 components above (worksheet 1).

Ad N (3.) Adjusted Area Natural Integrity Rating, 1-7: The overall natural integrity if a boundary adjustment removed separable intrusions (worksheet 1).

Ad AN (4.) Adjusted Area, Apparent Naturalness Rating, 1-7: The overall rating of an area's apparent naturalness if a boundary adjustment removed separable intrusions (worksheet 1).

S (5.) Solitude Opportunity Rating, 1-7: The overall rating of an area's opportunity for solitude (worksheet 2).

R (6.) Primitive Recreation Opportunity Rating, 1-7: The overall rating of an area's primitive recreation opportunities (worksheet 2).

CR (7.) Composite Wilderness Attribute Score, 4-28: The overall score reflecting an area's wilderness attributes, sum of natural integrity, apparent naturalness, solitude and primitive recreation attribute ratings (Numbers 1, 2,5 and 6 above).

ACR (8.) Adjusted Area Wilderness Attribute Score, 4-28: The overall score reflecting an area's wilderness attributes if separable naturalness intrusions were removed by boundary adjustments. Sum of adjusted area natural integrity, adjusted area apparent naturalness, solitude and primitive recreation attribute ratings (Numbers 3, 4, 5 and 6 above).

SA (9.) Supplementary Wilderness Attribute Rating, 1-5: The overall rating of an area's supplemental values based on presence of extraordinary ecological, geological, scenic and cultural features. (Worksheet 3) *Note that this attribute is rated on a 5-point scale.

SV (10.) Scenic Value Rating, 1-4: The rating of an area's scenic values based on a modified application of the visual management system.((worksheet 3) *Note that the rating uses a 4-point scale.

As soon as wilderness attribute ratings are completed for an area, worksheet 4, the Wilderness Attribute Rating Summary sheet should be filled out to facilitate immediate keypunching of the vital data (rating scores) produced by the system. The other 3 worksheets will also be ADP processed later so all the wilderness attribute and component evaluation data, will be available for subsequent land use planning or wilderness study.

Analysis

The summary sheet (worksheet 4) has all the wilderness attribute scores and provides a basis for very general analysis, even before computer processing. Roadless areas on a Forest or in a Region can be hand sorted by Wilderness Attribute scores and so forth. Basically. the worksheet is designed as a computer keypunch form. Once the attribute ratings are in the computer they can be analyzed many different ways in combination with all the RARE II data using computer system 2000.

Following is a suggested way to display the wilderness attribute data for use in decision making:

Printout Set 1: Wilderness Attribute Ratings and Composite Score Comparison: The 10 wilderness attribute ratings, which include the 2 composite wilderness attribute scores, offer a great potential for data analysis. The task force will continue to develop an analysis scheme. At this stage only one suggested kind of printout is offered to array the wilderness attribute rating scores for use in decision making.

Printout Set 1, a sample of which is attached, prints out all wilderness attribute ratings for all roadless areas in a region, or alternatively, all areas within the representativeness types--within ecosystem types, physiographic provences (landform), accessibility to population,and wildlife representative areas. Regardless of what group of areas are included in the printout, all 10 wilderness attribute ratings are listed for each area, and the composite wilderness attribute score is graphically plotted on the right side of the printout so all the areas printed can be quickly scanned to identify those with the highest or lowest ratings.

WORKSHEET 4 - WILDERNESS ATTRIBUTE RATING SUMMARY SHEET

Area Code: (column): 1 2 3 4 5

Forest(s): 6 7 8 9 10 11

12

Name of Area: 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

Attribute Scores:

		Column
1.	Natural Integrity (1-7)	44
2.	Apparent Naturalness (1-7)	45
3.	Adjusted Area, Natural Integrity (1-7)	46
4.	Adjusted Area, Apparent Naturalness (1-7)	47
5.	Solitude Opportunity (1-7)	48
6.	Primitive Recreation Opportunity (1-7)	49
7.	Composite Wilderness Attribute Score (4-28) (Sum of 1, 2, 5, 6)	50 51
8.	Adjusted Area Composite Wilderness (4-28) Attribute Score (Sum of 3, 4, 5, 6)	52 53
9.	Supplementary Wilderness Attribute Overall Score (1-5)	54
10.	Scenic Value (1-5)	55

Worksheet 1 Worksheet 2 Worksheet 3

WILDERNESS ATTRIBUTE RATING SCORES AND COMPOSITE SCORE DISTRIBUTION

Code	Area	Wilderness Attribute Scores (1) Naturalness 1-7	(2) Apparent Nat'ness 1-7	(3) Adjusted Nat'ness 1-7	(4) Adjusted Apparent Nat'ness 1-7	(5) Solitude 1-7	(6) Primitive Recreation 1-7	(7) 1/ Composite 4-28	(8) Adjusted2/ Composite 4-28	(9) Supplementary Attributes 1-5	(10) Scenic Value 1-4	Composite (7) Wilderness Attribute Rating: lowest 4	8	12	16	20	24 highest 28
		(Hypothetical Data)															
1. 6070	Mica Mtn.												x				
2. 6124	Cindy Cr.	-6-	-7-	-7-	-7-	-5-	-6-	-24-	-25-	-2-	-3-						x
3. 6129	Raisin Cr															x	
4. 8869	Daisy Cr.																x

This is a suggested printout to assist decisionmaking. All attribute scores are printed and the composite Wilderness Attribute Score is plotted to graphically display how areas compare.

Separate printouts can be ordered for areas grouped by region, ecosystem, landform, wildlife, accessibility, or any combination thereof.

1/ The composite score is the sum of numbers 1, 2, 5, 6.

2/ The adjusted composite score is the sum of numbers 3, 4, 5, 6.