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Northwest Rivers Study

Assessment Guidelines: Montana

State of Idaho
State of Montana
State of Oregon
State of Washington

NW Indian Tribes

USDA Forest Service
USDI Bureau of Land Management
USDI Fish and Wildlife Service
NW Power Planning Council
Bonneville Power Administration

Wildlife

Updated January 1988

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WILDLIFE GUIDELINES

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PACIFIC NORTHWEST RIVERS STUDY

Method for Assessing the Significance of River Segments
and Systems for Wildlife Resources in Montana

January 1988

LEAD AGENCY

Montana Department of Fish, Wildlife and Parks

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INTRODUCTION

The Pacific Northwest Rivers Study was initiated in February 1985 to assess the significance of river segments and drainage basins for a variety of fish, wildlife, natural, recreational and cultural resource values. The Montana Department of Fish, Wildlife and Parks (MDFWP) was designated to take the lead in assessing the value of rivers for wildlife in the state of Montana.

This report summarizes the methods used to assess the wildlife resources in Montana. It describes how river assessment units were developed, what criteria were used to determine the value of the units, and what standards were used to apply the criteria. The guidelines also present the methods used to collect, analyze, and review the necessary data. Evaluation and potential uses of the data base are also discussed.

The assessment guidelines have changed considerably from those outlined by Graham (1985). The original approach to the wildlife assessment involved either wildlife habitats and species exclusively associated with riparian areas or regionally important big game species. As the assessment process evolved, the approach shifted from a riparian dominant species to a more inclusive, diversified wildlife database. Although riparian zone species and habitat continued to play a primary role in the analysis, species diversity and overall habitat condition played an equally important role.

CATEGORY DESCRIPTION

Current wildlife values were based on two criteria: species and habitat values. Habitat values included the occurrence of specially designated lands and the quality of riparian habitat within each assessment unit. The species criteria considered the occurrence of habitats important to threatened and endangered species and species of special interest or concern. The species value also reflected the relative abundance and diversity of game and furbearer species.

Data on recreational values of wildlife resources were also collected for each assessment unit. Information included both consumptive and nonconsumptive wildlife uses. Consumptive values were based on the results of big game harvest telephone survey conducted by MDFWP each year. Nonconsumptive values were based on subjective evaluation of each assessment unit's aesthetics, scientific and educational value, and degree of nonconsumptive wildlife uses.

Due to the difficulty in applying the harvest information (compiled for only one year by hunting district) to each river assessment unit, the consumptive wildlife value was not considered sufficiently accurate to rank assessment units. Review of the nonconsumptive wildlife information indicated it also was too subjective for determining the final recreational value. Therefore, the use of recreation value in the final rankings was postponed until these data could be further improved and verified (see Section on Project Evaluation).

VALUE CLASSES

Each river assessment unit in Montana was assigned to one of the following four value classes to denote its value for wildlife:

I - Outstanding wildlife resource
II - Substantial wildlife resource
III - Moderate wildlife resource
IV - Limited wildlife resource
V - Unclassified wildlife resource

CRITERIA

HABITAT VALUE

Habitat criteria for each river assessment unit were designed to recognize specially designated lands and to evaluate riparian habitat quality. Specially designated wildlife lands included Wild and Scenic River corridors, National Wildlife Refuges, National Fish Hatcheries, State Wildlife Management Areas, Waterfowl Production Areas, Nature Conservancy Preserves, Conservation Easements and U.S. Forest Service (USFS) and Bureau of Land Management (BLM) Research Natural Areas.

Five riparian characteristics were evaluated for habitat quality. These characteristics included the condition of the riparian zone; the amount of

mature forests, wetlands and island habitats; and the structural/vegetative diversity of cover types.

SPECIES VALUE

The species value emphasized three species categories: 1. critical habitat for recovery of threatened or endangered species; 2. specially designated wildlife habitats or habitats important to species of special interest or concern in Montana; and 3. game and furbearer species populations and/or critical habitats within the assessment unit.

Federal or state listed threatened and endangered species included the gray or rocky mountain timber wolf, grizzly bear, bald eagle, whooping crane, peregrine falcon, and black-footed ferret. The mountain caribou was not officially designated as a threatened or endangered species in Montana and, therefore, was excluded from the assessment process.

The second species category addressed vertebrate species of special concern and specialized wildlife habitats considered unique and/or rare. Emphases were placed on those species or habitat associated with the riparian zone. The list was derived from Montana's list of Species of Special Interest or Concern (Flath 1984) or the Montana Natural Heritage Program's current list of Animal Species of Special Concern (Montana Natural Heritage Program 1987). Specialized habitats such as warm springs, waterfowl staging areas, and great blue heron rookeries were recommended by resource cooperators.

The game and furbearing species value utilized information gathered on the relative abundance or habitat quality for 15 game and 6 furbearing species. Maps prepared by MDFWP personnel in 1978 and updated in the early 1980's which indicated critical and seasonal ranges of most game species were used in assigning most game species values. No distribution or habitat maps were available for furbearers.

RECREATION VALUE

As previously mentioned under Category Description, the recreational value was not used in the 1987 assignment of final value classifications. Pending an update in this portion of the data base in 1988, a recreational value stressing both consumptive and nonconsumptive wildlife values will be added.

The consumptive wildlife data collected in 1985 was based on 1983 harvest statistics from the DFWP's annual telephone harvest survey. Statistics were collected for four big game species or groups--deer (combined white-tailed and mule deer), elk, black bear, and antelope. Three values assessed by hunting district were modified from the hunter survey and applied to each river assessment unit. These values included: total hunting pressure (hunter days), hunter success (percent successful hunters), and percent non-resident hunting pressure (percent of total pressure). Nonconsumptive values were obtained by participants' evaluation of three criteria: nonconsumptive wildlife/habitat oriented use (local, regional, statewide, national), scientific/educational value, and aesthetics.

STANDARDS

OVERVIEW

Standards to rate each criterion were based on a point system. Weights or points were first assigned to each criteria (e.g. to wetlands, bald eagles, or elk) based on each criterion's association with riparian zones and its relative importance or rarity. For example, more weight was given to white-tailed deer because of their association with riparian habitat than to mountain goat. In addition, more weight was assigned to river otter because of its relative rarity than to beaver. These weighted values were then multiplied by a value factor assigned by the biologists. Weight factors multiplied by the values were summed for the category to yield a total number of points scored for each category.

HABITAT VALUE

Specialized Land Designations

Weights for each specialized land designation were based on the protection afforded by a designation from hydroelectric development and the reasons for the land designation. Lands designated primarily for their wildlife or riparian attributes were given the highest points (Table 1). These included Wild & Scenic Rivers, National Wildlife Refuges, Waterfowl Protection Areas, and state wildlife management areas. Nature Conservancy Preserves were also assigned a significant weighting because they are purchased and managed to preserve biological communities. Fewer points were awarded USFS and BLM Research Natural Areas, National Fish Hatcheries and conservation easements.

References used to locate specially designated lands include a MDFWP publication on Department lands (MDFWP 1986), contacts with wildlife refuge managers and Nature Conservancy personnel, and contacts with state and federal biologists during the data collection phase.

Table 1. Weights assigned specially designated lands.

Land Use	Assigned Weight
· Wild and Scenic Rivers	25
· National Wildlife Refuge	10
· National Fish Hatchery	5
· Wildlife Management Areas	10
· Waterfowl Production Areas	10
· Nature Conservancy Preserves	15
· Conservation Easements	5
· Research Natural Areas	5
· Other (variable)	5

For each one of these designated lands, biologists assigned a either a value of 0 (absent) or 1 (present).

Riparian Habitat Quality

Points were awarded for five habitat quality attributes. For each of these habitat characteristics, the biologists could assign a rating of high (3 points), moderate (2 points) or low (1 point). All five factors were equally weighted (5 points) except if a 3 was assigned for condition, wetlands, or vegetative diversity. In these situations, 10 additional bonus points were awarded. The following attributes were evaluated:

1. Condition of the Riparian Zone:
   - High - Riparian zone is in excellent condition, minimally impacted by land uses such as roads, agriculture grazing, subdivisions. Riparian zone retains nearly all of its natural vegetation characteristics and wildlife values;
   - Moderate - Riparian zone is moderately affected by land uses (as described above) but retains significant amount of inherent natural vegetation characteristics and wildlife values; impacted areas have potential to be rehabilitated;
   - Low - Riparian zone is highly affected by land uses; only remnant patches or blocks of natural vegetation exist and only limited opportunity for vegetative rehabilitation.

2. Amount of Mature Forests:
   - High - Numerous large tracts (>150 ac) or continuous bordering (>30 ft. wide) of mature deciduous or coniferous forest (e.g. gallery forests);
   - Moderate - occasional large tracts (<150 ac) or intermittent bordering (<30 ft.) of mature deciduous or coniferous forest;
   - Low - Little or no forest development along riparian zone.

3. Amount of Wetlands:
   - High - Oxbow lakes, sloughs, backwater areas or other significant wetland types common along water course (characteristic of large meandering rivers);
   - Moderate - Occasional oxbow lakes, ponds, sloughs, backwater areas, or seeps;
   - Low - Few to no significant wetland areas associated with water course(s).

4. Amount of Islands:
   - High - Many (characteristic of braided rivers/streams);
   - Moderate - Occasional to several islands;
   - Low - Few to no islands.

5. Vegetative Structure/Diversity:
   - High - Riparian zone vegetation well-developed and characterized by a wide variety of vegetation types and structural types appropriate for its size and configuration;
   - Moderate - Riparian zone less well-developed due to land uses or natural characteristics; has moderate variety of vegetation and structural types;

Low - Riparian zone dominated by few to one major vegetation type (e.g. crops, pasture, range) or is unvegetated (urban, industrial situations).

Final Habitat Value Calculation

Cutoff values for class assignments were made for both specialized land designations and habitat quality; the highest classification for the 2 categories was used for the final habitat rating. Cutoff values were assigned as follows:

	Land Points	Habitat Quality Points
ClassI	>= 30	>=70
Class II	>= 20	>=55
Class III	>= 10	> 40
Class IV	< 10	<=40

SPECIES VALUE

Threatened and Endangered Species

Each threatened or endangered species was assigned weight values of 15 points. However, biologists could rate the occurrence of the species or its critical habitat with a value of 0 (species absent), 1 (species present but assessment unit does not contain habitat essential for recovery), or, in some cases, 2 (assessment unit contains habitat essential for recovery).

For bald eagles, a 1 indicated wintering or migrating concentration area and a 2 indicated current nesting use. An additional 20 bonus points were awarded for bald eagle nesting sites because of this species dependence on riparian habitat. Bald eagle nesting and winter information was obtained from Natural Heritage Program (MNHP 1987) and contacts with MDFWP endangered species biologists.

For the grizzly bear, a rating of 2 represented management areas or situations 1 and 2 as established by the respective National Forests for the Yellowstone and Northern Continental Divide ecosystems. For the Cabinet-Yaak ecosystem, the area delineated in the MDFWP Grizzly Bear Environmental Impact Statement (Dood et al. 1986) was used to determine a 2 rating. A rating of 1 represented other management situations or fringe areas felt to be important for grizzly bear recovery.

Areas supporting recently reintroduced or breeding peregrine falcons (Flath pers. comm. 1987) received a 2. Areas with historic peregrine eyries received a 1. Because of the current controversy over wolf recovery in Montana, only currently occupied habitat which is being managed for wolf recovery received a rating of 1. At present, this area constitutes only the North Fork of the Flathead.

Whooping crane habitat was limited to those migration stopover areas occasionally used in eastern Montana. These areas earned a rating of 1. Similarly, habitats identified for the potential reintroduction of black-footed ferrets received a rating of 1 (Clark et al. 1987).

Species of Special Concern and Specialized Wildlife Use Areas

Weights for species of special concern and specialized wildlife use areas depended on the relative uniqueness or rarity of the category. Value assignments were either a 0 (absent) or 1 (present). Weights were assigned as follows (Table 2):

Table 2. Weights assigned species of special concern and specialized wildlife use areas.

Species of Special Concern or Special Wildlife Use Area	Weight
1. Waterfowl staging areas, low level feeding flight paths, "prime wetlands" ;	9
2. Warm/hot springs open in winter and used by winter/migrating waterfowl species;	9
3. High gradient streams supporting breeding harlequin ducks;	12
4. Habitats supporting amphibians of special concern (Pacific giant salamander, Coeur d'Alene salamander, rough skinned newt, tailed frog);	12
5. Habitats supporting reptiles of special concern (spiny softshell, snapping turtle, milk snake, plains hognose snake);	12
6. Colonial bird nesting sites (>5 pairs of double-crested cormorants,great blue herons, American white pelicans);	9
7. Large nesting osprey population area (>1 active nest per river mile; minimum 5 river miles);	12
8. Habitats occupied by nesting golden eagles;	12

9. High density raptor nesting or winter concentration area (nocturnal and/or diurnal raptors); 9

10. Habitat supporting either mountain or piping plovers; 12

Information on the distribution of species of special concern was gathered primarily from the Montana Heritage Program (MNHP 1987), the state's nongame wildlife program (Flath, pers. comm. 1987), and field biologists.

Game and Furbearer Species Value

Each of the game or furbearer species was assigned a weighting from 2-4 depending on its statewide management significance and its association with riparian areas (Table 3). High concern species included white-tail deer, elk, moose, black bear, and river otter. Weights for all game and furbearing species were assigned as follows:

Table 3. Game species importance values.

Species	Weight	Species	Weight
White-tail	4	River Otter	4
Mule deer	4	Beaver	3
Elk	4	Bobcat	2
Antelope	2	Lynx	2
Bighorn sheep	3	Marten	2
Moose	4	Turkey	3
Black bear	4	Mountain grouse	2
Mountain lion	2	Pheasant	2
Sharp-tail	2	Canada goose	3
Sage grouse	2	Wolverine	2
Mountain goat	2	Other	2

These weighted values were multiplied by the importance value (game species) or habitat suitability rating (furbearing species) assigned by the biologists as follows:

Importance Value	Reason
High 3	Indicates unit supports large populations and/or contains highly critical habitat (e.g. winter range) for a significant population.
Medium 2	Indicates a unit contains habitats of moderate importance to the species and/or supports moderate populations.

Low	1	Indicates a unit contains some value on a seasonal basis or it supports low or occasional populations.

For furbearer species, the ratings were defined by habitat suitability as follows:

Habitat Suitability		Reason
High	3	Indicates a unit has excellent habitat quality and is able to support a high population density.
Mod	2	Indicates a unit has moderate habitat quality or supports a moderate population density.
Low	1	Indicates a unit has patchy or marginal habitat for the species or supports a low population density.

Final Species Value Calculation

Species weights multiplied by biologist ratings were summed to obtain total points for each of the 3 species categories. Based on point distributions and subjective evaluations, cutoff values were then assigned to each category to give each river assessment unit Class I, II, III, and IV species value. The highest of the 3 species values became the final species value for the river assessment unit.

Final Resource Value Classification

With only 2 exceptions, the final resource value for the assessment unit became the average of the final habitat and species values rounded upwards. One exception occurred if the habitat value equaled Class I and the species value equaled Class II. In this case, the final resource value became Class II rather than Class I. Similarly, if the final species value was Class IV and the final habitat value Class III, the final resource value became Class IV. These corrections were made because of the greater amount of information and reliability found in the species part of the assessment process and a bias towards over-rating riparian habitat quality.

METHODS

DATA COLLECTION

Montana selected a questionnaire and interview approach for obtaining the river assessment information. The questionnaire provided a standardized system to evaluate wildlife values associated with rivers and a means to document response (Appendix A). The questionnaire also lent some objectivity to the assessment process and facilitated computerization of the information collected.

Meetings with wildlife biologists from the appropriate National Forests, the Bureau of Land Management, and MDFWP were held in each of the seven MDFWP regions. At each meeting, the biologists answered a questionnaire for each river assessment unit concerning location and habitat and species values. Answers were recorded on data forms. Biologists from different agencies generally worked in small groups on the rivers in their management areas. State, BLM and USFS wildlife maps and documents were used as needed during the assessment process.

Because wildlife use is not restricted by the presence of water, strict river and stream reaches were too narrow in their definition to describe a river assessment unit. Therefore, units were defined as a main stem, a stream or river basin (including its tributaries) or the tributaries to a main stem. The hydrologic unit, rather than river mile, became the primary geographic reference point.

Information requested on the questionnaire included a verbal description of the river assessment unit and its location by hydrologic unit, MDFWP region, state drainage number, water code, and the unit type (main stem, basin or tributaries). Location of the lower and upper boundaries were described verbally, legally, and by river mile. Additional location description included the drainage to which the unit is a tributary, the river mile and legal description of its confluence, and its location by county. To insure accuracy and completeness, the coding of the location description was completed by the river assessment staff.

DATA ANALYSIS

During the first year of the study, data from the questionnaire were entered and analyzed using the MDFWP Region 1 Action Discovery Computer System with DataStar and ReportStar software. DataStar was used to enter the data gathered by the questionnaire. Reportstar was use to assign weights, multiply these by the biologist values and to assign cutoff values. During the next year of the Rivers Study, the entire wildlife data base was converted to DBASE III+ along with the other Montana resource area data bases. A DBASE III+ program was written to assign weight values, calculate totals points and assign classification.

REVIEW

At the end of the first year (1985), the guidelines, questionnaire, methods and results of the initial classification were reviewed by cooperating resource experts and MDFWP game managers. Recommendations for data base improvements were put off until the entire system was converted to DBASE III+ in early 1987.

During 1987, the entire data base and classifications were reviewed and updated by MDFWP field biologists. The update reflected new species of special concern distribution information collected by state's new Heritage Program and recently compiled threatened and endangered species management information put together by MDFWP. In addition, wildlife units were further refined and missed areas were included. Given the greater programming flexibility of DBASE III+, the classification program was also modified. A

summary of the classification results for this recent update will be available in early 1988.

PROJECT EVALUATION

The wildlife river assessment has undergone and will continue to undergo a considerable evolution following its conception. What started out as an assessment of Montana's riparian wildlife habitat and species developed into the beginnings of a statewide wildlife data base.

The interagency approach to developing the original assessment units and completing the data base questionnaire was a major success of the project. This approach allowed all agencies involved in wildlife species and habitat management to participate in the process. Conversion of the wildlife database to DBASE III+ has facilitated statewide accessibility and use. With the recent update, many types of incomplete or inaccurate data have been corrected.

Although agency maps and documents were available during the questionnaire meetings the values assigned in the assessment were generally subjective. The reliability of the species value could be greatly enhanced with the addition of quantitative population estimates.

In calculating the habitat value, analysis of the riparian zone was accomplished through a subjective high to low ranking for riparian characteristics. While the basic standards in determining riparian habitat value are in place, the need to quantify these values through a statewide riparian zone inventory using aerial photos, field analysis, more specific interviews and other methods is a priority. A data quality rating system similar to that used in the fisheries portion of the river assessment process should be incorporated into the wildlife database.

The variation in unit size and the habitat variability within a unit lead to inconsistencies in the final resource value determination. In Region 2, for example, the entire length of several drainages were lumped into one unit. Because of habitat variation from the mouth of a stream to its headwaters, a single unit accumulated considerable points based solely on the habitat variety, rather than habitat and species quality. Region 1, in northwestern Montana and a region only slightly larger than Region 2, contained nearly twice the number of river assessment units as Region 2. Habitat condition and species values were rated over a narrower range of habitat diversity.

The harvest information in the recreation portion of the data base applied to hunting districts rather than assessment units. Because these data could not be consistently applied to each wildlife assessment unit, an effort will be made in 1988 to correct this deficiency. Similarly, the nonconsumptive recreation information will be evaluated and revised with more quantitative information.

USE CONSIDERATIONS

The potential uses of the wildlife river assessment database are limited only by the wildlife biologists, resource planners, and wildlife and land managers who could benefit from the system. Their use of the system as a planning tool and their involvement in updating and expanding the database will determine its future use. Although the data base and the final resource values can be used in the planning process, it should not be considered suitable for the siting of facilities or solely determine major changes in land use. It can, however, serve as a valuable tool for assessing overall quality of species diversity and densities and overall habitat considerations on a relative scale.

For example, the database could be used to provide information on wildlife values by watershed for planning species management and timber harvest or other activities within that drainage. The database could also aid in determining habitat protection and land acquisition needs. Units with habitat ratings of Class I could be included in a potential list of lands needing formal land protection.

Wildlife resource values can now be compared across the state. Locations of potential habitat for threatened and endangered species and species of special concern, relative species densities, and critical habitats for particular species can be accessed through the database. With the wildlife data base, collected data will now endure personnel changes and file rearrangement.

The use of the data base will continue to expand and become more reliable as more quantitative data are entered, unit size between regions becomes more consistent and habitat variability within a single unit is reduced.

PARTICIPANTS

Two levels of participation occurred in the wildlife river assessment project. The Wildlife Task Group Force consisted of cooperating wildlife experts from federal and state agencies to oversee assessment activities and provide their input to the senior resource expert and staff. Specifically, these individuals reviewed the Rivers Study Manual and proposed value classes, criteria, and standards; were invited to participate in all progress meetings; and provided input into the determination of the final classification system. Participants on the Wildlife River Assessment Task Force were listed on the first page of these guidelines.

The other level of participation occurred by the biologists from MDFWP, US Forest Service, and Bureau of Land Management involved in providing the data for the wildlife assessment. These individuals were sent the preliminary final resource values for each unit in their area with the opportunity for review. Participants are listed by their agency affiliation and meeting locations are in parentheses.

Region 1
(Kalispell, Libby)

Kootenai National Forest
- Al Christensen
- Reed Kuennen
- Don Godtel
- Bill Pomeroy
- Alan Bratkovich
- Gary Altman
- Bruce Haflich
- Ron Williams
- Eric Heinz

Lolo National Forest
- Jerry Diebert

Montana Dept. of FW&P
- Jim Cross
- Jerry Brown
- Shawn Riley
- Bruce Campbell
- Dan Casey
- Marilyn Wood

Flathead National Forest
- Bob Hensler
- Tom Holland
- Tom Wittinger
- Bruce Hird
- Vernon LaFontain

Region 2
(Missoula)

Bitterroot National Forest
- John Ormiston
- Dale Hoth

Lolo National Forest
- Mike Hillis
- Jerry Deibert

Deerlodge National Forest
- Mike Paterne
- Karen Wilson

Montana Dept. of FW&P
- John Firebaugh
- Kurt Alt
- Bob Henderson
- Lyn Nielsen

Bureau of Land Management
- David McCleerey
- John Prange

Region 3
(Wall Creek Game Range)

Deerlodge National Forest
- Tina Crump

Gallatin National Forest
- Jerry Light (attended R-5)
- Keith Giezentanner
- Tom Puchlerz
- Terri Grotzinger

Beaverland National Forest
- Mike Rath
- Jerald Berry

Montana Dept. of FW & P
- Joel Petersen
- Howard Chrest
- Mike Frisina
- Jeff Herbert
- Graham Taylor
- Jon Swenson

Bureau of Land Management
- Jack Jones
- Ted Wenzel
- Lewis Myers

Helena National Forest
- Carl Frounfelker

Region 4
(Great Falls)

Lewis and Clark National Forest
- Roger Evans
- Louis Young

Bureau of Land Management
- Tad Day
- Larry Eichhorn

Montana Dept. FW & P
- Jim Mitchell
- Dick Bucsis
- Kerry Constan
- Frank Feist
- John McCarthy
- Gary Olson
- Bob Watts

Region 5
(Billings)

Gallatin National Forest
- Jerry Light

Lewis and Clark National Forest
- Wayne Butz

Custer National Forest
- John Edwards

Montana Dept. FW & P
- Charlie Eustace
- Shawn Stewart
- Claire Simmone
- Tom Butts

Bureau of Land Management
- Steve Seth

Region 6
(Malta)

Bureau of Land Management
- Mike Fisher
- Chris Hoff
- Dwain Prellwitz
- John Grensten

Montana Dept. of FW & P
- Harold Wentland
- Al Rosgaard
- Harvey Nyberg
- Ron Stoneberg

Region 7
(Miles City)

Custer National Forest
- John Edwards

Bureau of Land Management
- Mark Gorges
- Gerry Gill
- Dan Bricco

Montana Dept. of FW & P
- Neil Martin
- Bernie Hildebrand
- Gary Hammond
- Steve Knapp
- Heidi Youmans

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