

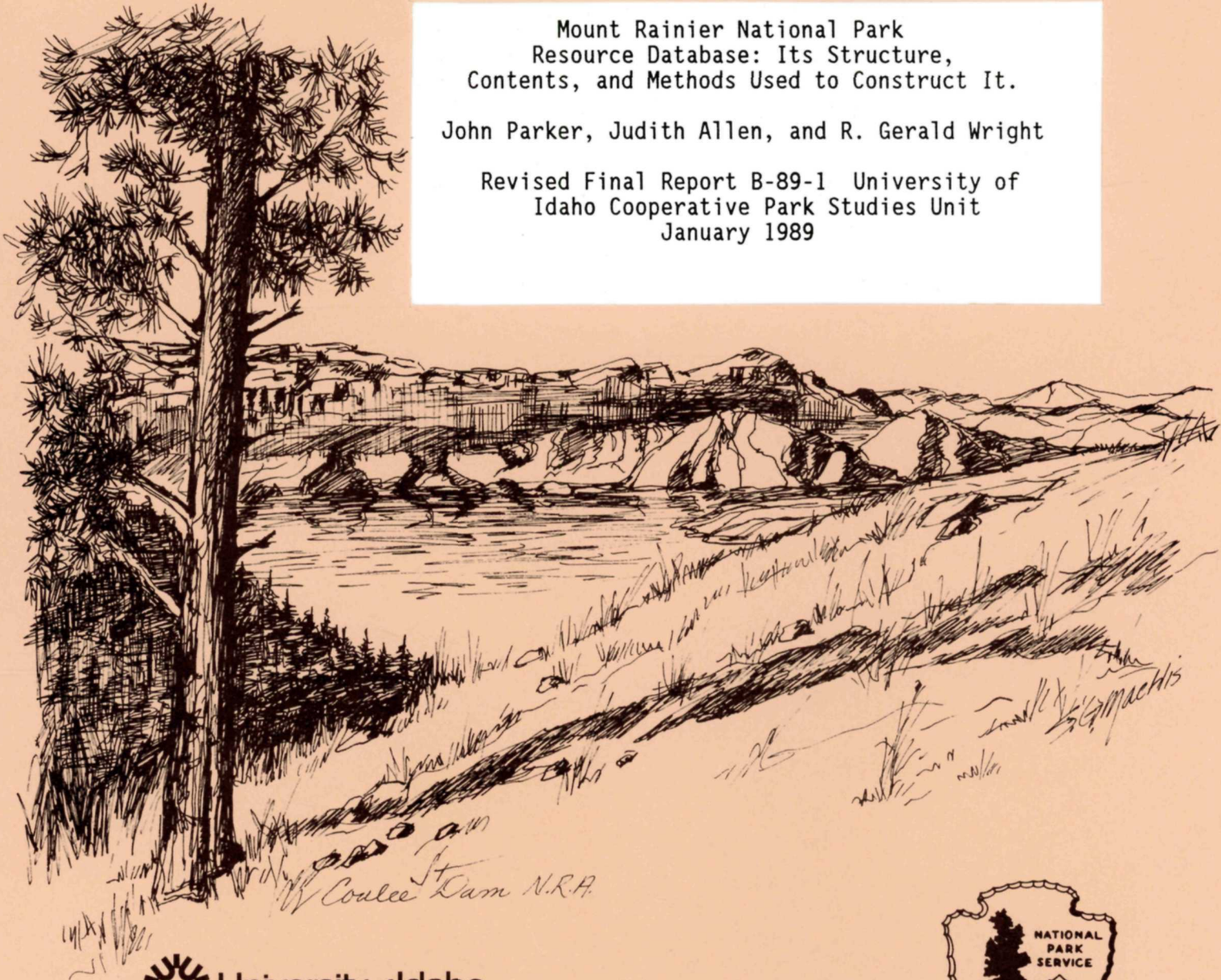
COOPERATIVE PARK STUDIES UNIT

UNIVERSITY OF IDAHO

Mount Rainier National Park
Resource Database: Its Structure,
Contents, and Methods Used to Construct It.

John Parker, Judith Allen, and R. Gerald Wright

Revised Final Report B-89-1 University of
Idaho Cooperative Park Studies Unit
January 1989



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SUBAGREEMENT NO. 8

to

COOPERATIVE AGREEMENT NO. CA-9000-8-0005

Managing Resource Data in the Pacific Northwest Region

University of Idaho CPSU and NPS Pacific Northwest Region

Introduction

The proper management of the resources of parks is largely predicated on a park's ability to have access to and use information appropriate for the task. Most parks have more information on their resources than managers or research personnel commonly realize. However, if this information is poorly organized or otherwise not readily accessible, management cannot use it. Unfortunately, the organization of resource information in most parks is generally poor. This has resulted in redundant data collection efforts, inconsistent or ineffective monitoring programs, and sometimes costly environmental mistakes. This project originated because the above problems are all too common in our national parks. Support for this project was also a recognition that most parks lack the personnel or time needed to properly organize resource information.

The objective of this project was to systematically locate all of the research, monitoring, and inventory studies and surveys dealing with the natural and cultural resources that have taken place in Mount Rainier National Park (MORA) and organize and summarize the key characteristics of these studies in a microcomputer database. Similar projects have or will be undertaken for all other parks in the Pacific Northwest Region. The Pacific Northwest Regional Office library and the three regional Cooperative Park Studies Units are to be repositories for the databases from all parks.

The databases use Ashton-Tate dBASE III+ as the manager. Specific information in the database can be found by using standard dBASE commands or by using the menu-driven computer programs written specifically for such queries. The programs which are described in the separate User's Manual

(Hoffman 1989) are designed to selectively filter a user's inquiries regarding information in the database so that a particular search can be as broad or specific as desired.

This report is in two sections. The first describes the structure of the MORA database, the coding used to abstract information, and lists keywords and UTM coordinates used for entries in the database. The methods used to construct the database are also described. The second section summarizes pertinent characteristics of the MORA database including the kind of studies done in the park, the type of data collected, and a summary of how the reports were published.

The Mount Rainier Resource Database

Structure of the Database

The Mount Rainier resource database contains 48 fields of information described in Table 1. Some of the fields contain literal information such as author, date the study took place, a brief description of the study, and its location in the park. One field is reserved for keywords which generically describe the study. Other information in the database is numerically or alphabetically coded to reduce the size of the database. A complete description of each of the fields in the database is contained in the data entry guidelines found in Appendix I. This guide describes how and what kinds of information should be entered in each field, and thus should be followed when new information is added to the database.

Included in Table 1. is an indication if the information in the field is used in the computer program which searches the database, whether it is used

Table 1. Structure of the MORA Resource Data Base

Field	Field Name	Field Type	Width	Used in Searches	Used in Summaries	Used in Output	Comments
1	STUD_NUM	character	9				
2	YEAR	character	4		X	X	
3	AUTHOR	character	65	X		X	
4	TITLE1	character	65	X		X	THE KEYWORD SEARCH ALSO CHECKS THESE FIELDS
5	TITLE2	character	65	X		X	
6	SOURCE	character	65			X	
7	DAT_DESCRP	character	65			X	
8	DAT_DESC2	character	65			X	
9	KEYWORDS	character	65	X		X	
10	CATEGORIES	character	17	X	X	X	
11	ST_LEVEL	character	1				
12	STUDY_TYPE	character	2		X		
13	BEG_DATE	character	4				
14	END_DATE	character	4				
15	PROJ_STAT	character	1	X		X	
16	SPRING	logical	1				
17	SUMMER	logical	1				
18	FALL	logical	1				
19	WINTER	logical	1				
20	LOCATION	character	65				
21	WATERSHD	character	90	X	X	X	THESE MUST BE DONE FOR EACH PARK
22	SUBDISTR	character	45	X	X	X	
23	MIN_E_UTM	character	4				
24	MIN_N_UTM	character	5				
25	MAX_E_UTM	character	4				
26	MAX_N_UTM	character	5				
27	MAX_ELEV	character	4				
28	MIN_ELEV	character	4				
29	BIOTICZONE	character	30	X	X	X	
30	DATA_AVAIL	character	65			X	
31	SCALE	character	9				
32	COMPUTER	character	1				
33	SOFTWARE	character	15				
34	DATA_TYPE	character	50			X	
35	DISTRIBU	character	2			X	
36	REPEATABLE	character	1				
37	F_STATUS	character	1	X		X	
38	S_STATUS	character	1	X		X	
39	P_STATUS	character	1	X		X	
40	MG_CONCERN	character	20	X		X	
41	FUNDING1	character	2		X		
42	FUNDING2	character	2		X		
43	RES_MAN_EL	character	40	X	X		THESE MUST BE DONE FOR EACH PARK
44	SERV_ISS1	character	3	X	X		
45	SERV_ISS2	character	3	X	X		
46	COMMENTS1	character	65			X	
47	COMMENTS2	character	65			X	
48	NOTES	Memo	10				

to summarize information in the database (for example Tables 3 and 4 in this report), or whether it can be part of the output of the search programs. As noted, certain fields such as park watershed (WATERSHD) and administrative district (SUBDISTR) contain codes unique to the park in question.

Methods used to Compile the Database

The MORA resource database was compiled over a period of eight months by a team of University of Idaho research associates. The team began working in the park library at Longmire, moved briefly to the resource management lab at Longmire, and then to the park headquarters at Tahoma Woods. At park headquarters they compiled information in the files of the resource management specialists, the existing computer databases, the archives, and the map files. Information was also gathered from the offices of the U. S. Geological Survey, Washington Departments of Game and Natural Resources, and the University of Washington library. Citations compiled by the NPS Regional Office library and made available on computer disk were also very helpful and provided a check on how thorough our searches were.

A problem in the data entry phase of this type of project is deciding whether or not to include a specific type of information in the database. Our desire was to have the database as comprehensive as possible yet not have it cluttered with non-essential records. An itemization of the kinds of information typically encountered in a park like MORA and the decision made on including them in the database is given in Table 2.

Table 2. The kinds of information included in the MORA Resource Database.

<u>Type of Information</u>	<u>Decision to Include or Exclude</u>
Research studies	included
Environmental statements & assessments	included
Resource management plans	included
Theses & dissertations	included
In-house reports	included
Unpublished reports by other agencies	included
Books	included when pertinent to the park
Newspaper clippings	not included
Maps	grouped logically in memo field
Research proposals	generally omitted
NPS regional and annual science reports	not included
Architectural plans & drawings	not included
Oral histories & transcripts	included
Popular or general magazine articles	selectively included if pertinent
NPS master plans	included
Regional plans including park resources	included if significant to park
Interpretive material, e.g., brochures	not included
Documents on regulations	not included
Weather data, tables	included (one record per station)
Trail and field guides	combined in one record and described in memo field
Slide and photo collections	combined in one record and described in memo field
Separate photos & posters	not included
Memos on resource management topics	selectively included
Archival documents	grouped into a minimum number of records, described in memo field.
Computer printouts of data	included
Proceedings or abstracts	included if it is only known reference to a study.

Information was entered into the database using project microcomputers. One of the computers was an IBM portable which allowed it to be conveniently taken to various sites outside the park. The study has been guided by a Regional Advisory Committee consisting of Ed Schreiner OLYM, John Jarvis NOCA, Stan Schlegel MORA, Ron Hyra, and Janet Edwards PRNO, and Darryll Johnson University of Washington CPSU. This Committee has been very helpful in providing suggestions on project direction, logistics, and equipment.

Contents of the MORA Database

Mt. Rainier is unique among parks in the Pacific Northwest in its long history of extensive scientific research. The accessibility of the park, its proximity to a major urban area, and the great diversity of resources contained within the park have had a great influence on the kinds of studies done in the park. At this time, 861 records, each representing an individual study, subset of information such as a map collection, or data collection effort are in the database.

An analysis of the information in this database reveals some interesting facts (Table 3). The majority of the information is relatively equally distributed among flora, fauna, geology, and history. This balance is rare among most parks and indicates that there are few major gaps in the knowledge of the resources at MORA. Research on glaciers and glaciation comprised the largest single category of studies. Significant study has also been done on volcanism, terrestrial mammals, birds, and forest and alpine vegetation.

We also classified the kind of study represented by an individual record (Table 4). The largest category of studies (23%) could be classified as

general resource surveys or descriptions. Most of these works have appeared only in internal reports published either by NPS or by the agency administering the study, and thus lacked peer review and were not widely distributed. Only 13 percent of the studies done at MORA resulted in a publication in a professional journal (Table 5).

The emphasis placed on monitoring and inventory efforts at MORA has been relatively minor. Only nine percent of the studies in the park have been devoted to this topic or were set up in such a way that they could be potentially used in subsequent monitoring programs. The primary reason for this is that most projects done in the park are not replicable. This is primarily because plots, if used, cannot be relocated, or the methods or sampling design were inadequately explained. While unfortunate, this is a factor common to most resource studies in national parks. At MORA this situation is particularly unfortunate because of the large amount of basic research which has been done which could have been incorporated into a monitoring program. Much of this basic research has been conducted through local educational institutions. Since the park was established, 54 graduate theses have been completed on resources in the park.

Table 3. Summary of the major resources that have been investigated in studies at Mt. Rainier.

<u>Resource Studied</u>	<u>Number of Studies</u>
1. Animals	
general	8
freshwater fish	14
terrestrial invertebrates	24
reptiles and amphibians	4
birds	23
mammals	77
	<u>151</u>
2. Plants	
general	41
forest/woodland vegetation	49
alpine/subalpine vegetation	53
exotic plants	5
threat./endangered/rare plants	8
lower plants	15
revegetation	14
	<u>185</u>
3. Geologic Features	
geologic processes	97
minerals	17
features and landforms	104
soils	11
	<u>229</u>
4. Hydrologic Features	
freshwater lakes	9
hot springs, thermal features	10
streams, rivers	22
water quality	8
	<u>49</u>
Atmospheric Meteorological	
climate, weather	28
wet, dry deposition	3
	<u>31</u>
Anthropogenic	
visitor use data	46
visitor impact data	61
archaeologic data	3
historical accounts	88
	<u>198</u>

Table 4. Classification of the major kinds of studies and documents contained in the MORA database.

<u>I</u> <u>Type of Study or Document</u>	<u>Number</u>	<u>Percent</u>
Research	122	14
Monitoring	75	9
Checklist	32	4
Survey	198	23
A treatment used as a mitigation maps	14	2
photographic collection	85	10
park field guides	19	2
administrative reports	20	2
planning and development reports	37	4
history/park exploration	40	5
promotional books	71	8
surveys of resource damage	40	5
numeric databases	40	5
	39	5

Table 5. Method in which Studies were Published or Made Available.

	<u>Number</u>	<u>Percent</u>
Published in a Scientific Journal	89	13
Non-NPS report, (not refereed)	106	15
Printed as a map or map overlay	96	13
Photographs or slides	15	2
An NPS report of some type	265	38
Published as an M.S. or Ph.D. Thesis	54	8
Available as part of a database	19	2
NPS collection	2	<1
Environmental Impact Statements	13	2
U.S. Geological Survey reports	33	5
U.S. Forest Service reports	13	2

Appendix I. RESOURCE MANAGEMENT DATABASE DATA ENTRY GUIDELINES

This appendix contains a list of current database fields and a brief discussion of how data are entered in each.

Study Number (9 characters) [STUD_NUM]

This is a unique identifier for each entry made. This number may or may not be the same as the record number assigned by the computer as each record is entered. The study number is important in keeping track of individual records, and in cross-referencing to other records. Enter the NPS four letter acronym for the park, followed by a hyphen and a four digit number. If more than one person is entering data for the same database, make sure the numbers each assigns are not overlapping.

Year (4 characters) [YEAR]

This field refers to the year the document was published or issued. In coding, enter nd if a date is not provided or is not clear.

Author (65 characters) [AUTHOR]

This field refers the authors of the publication, the individuals conducting the work, etc. Standard citation format is used in data entry. First author is entered last name first, followed by initials. If there are more authors than will fit in the field, omit the remaining authors. If an editor, indicate this with (ed.). If no author is indicated, enter Anon.

Title (2 fields 65 characters each) [TITLE1, TITLE2]

This field contains the complete title of the study, map, plan, book, etc. including punctuation. If a subtitle is given, precede it with a colon at the end of the title. Data entry follows standard citation format. For published books, capitalize words of the title (except for a, an, the, etc.). For journal articles, capitalize only the first word of the title. If the document is a particular edition or volume, indicate this also.

Source (65 characters) [SOURCE]

Source refers to publisher or agency issuing the document. In many cases, such as internal park documents, the source will not be obvious. Park Service reports should be referred to as such. Indicate if the document is an unpublished report. At the end, note the number of pages (e.g.414 p.).

Description (2 fields 65 characters each) [DAT_DESCRP, DAT_DESC2]

This field attempts to provide the best synopsis possible within the limited field of what the document contains. In entering information in this field, we have attempted to use precise language meaningful to those users who would likely be interested in the document. For example, in describing a geological study, we generally use the same geological terms as those in the paper. We also avoid making judgmental statements about the document.

For lengthy descriptions we have often used the Note Field described below to enter further details.

Keywords (65 characters) [KEYWORDS]

We have defined keywords as words, terms, or short phrases that are especially significant in a document, and that are useful in efficiently searching the database for studies on that particular subject. Keywords should be entered using lower case, except where they include a proper name (e.g. Douglas fir). Separate keywords within the field by a single space. Use no punctuation unless it is actually a part of the keyword word or phrase (e.g. C:N ratio).

A list of keywords used in the database and arranged alphabetically and by subject matter is given in Appendix III. Before assigning a new keyword, check this list. If there is already a keyword that is very closely related to the one you want to use, use the old one instead. The best keywords are highly specific, not broad or general.

Categories (1 field 17 characters) [CATEGORIES]

This field contains the numerical codes for resource categories that are defined in Appendix II. They have been developed to be logical and hierarchical. Documents frequently are concerned with more than one subject area. In assigning category codes, identify the 1, 2, or 3 most important subjects of the document. Enter the appropriate code for each relevant resource category (in the format 06-10). Up to three categories can be entered. Separate codes by a space.

Study Level (2 characters) [ST_LEVEL]

The entry in this field is specific to a resource category and defines the disciplinary level of the study. It is generally only used in reference to biological information. The codes for this field are given below.

Study Level Codes:

- | | |
|-------------------|------------------------|
| 1. community | 2. population |
| 3. species | 4. individual |
| 5. physiological, | 6. genetic 7. chemical |

Study Type (2 characters) [STUDY_TYPE]

The code in this field describes the methods employed in creating the document; or the type of document it is. Some studies will specifically state that they are one or another of the study types. Determining the study type for other studies will take some intuition. In some cases defining the study type will be arbitrary. The codes used in this field are listed below.

1. Research - an original study, , often including sections on methods/materials, results, analysis, conclusions.
2. Monitoring - data collected regularly, on a long-term basis.
3. Checklist - a study which involves making a more or less complete list of some particular resource in a given area.
4. Survey/inventory - generally a study involving general sampling of habitat or species or subject, i.e., an incomplete list or selective sampling.
5. A treatment or manipulation used as a mitigation measure.
6. A measure taken to protect a resource prior to impact.
7. Maps
8. Photographic collection
9. Illustrations
10. Records such as oral history tapes
11. Collections in the park
12. park field guides
13. Administrative report/study/memo
14. Planning and development report/study/proposal
15. History/exploration of the park
16. Prehistory, ethnography, archeology of the park
17. Promotional brochure/booklet for park facilities/services
- 18 Bibliography
19. Survey of resource damage
20. A numeric database

Beginning Date/Ending Date (2 fields 4 char. each) [BEG_DATE, END_DATE]

Some studies involve data obtained over a limited span of time. We used this field to indicate the span of time covered by a collection of material being entered as a single record. If specified in the document, enter the years. If not specified or not appropriate for the document, enter N/A.

Project Status (1 character) [PROJ_STAT]

The current status of the study. Codes are as follows:

1. Project proposed
2. Project on-going or recurring (i.e., monitoring)
3. Project suspended but not complete
4. Project completed
5. Project in-progress

Season (4 fields one logical character each)
[SPRING, SUMMER, FALL, WINTER]

Four logical fields (Fall, Spring, Winter and Summer) cover the season during which data were collected. Each is set by default at "False" so that one need only to enter a T where the season is appropriate. Enter a T in all fields for a study done year long.

Location (65 characters) [LOCATION]

Refers to the site the data was collected, or the area described in the document. Indicate whether the document is regional in scope or specific to the park, and whether the study concerns particular locations or a broad area.

Watershed (90 characters) [WATERSHD]

The entries in this field are specific to watersheds defined for each park. The watersheds are defined by four letter abbreviations. Enter as many watersheds as appropriate for the document, separating each by a space. If the document is not applicable leave field blank. If it applies parkwide, enter all.

Subdistrict (45 characters) [SUBDISTR]

The entries in this field are specific to the ranger subdistricts defined for each park. Four letter abbreviations are used for each. If the document is not applicable to either field leave field blank. If it applies parkwide, enter all.

Min/Max UTM's (4 fields 4 characters each)
[MIN_E_UTM, MIN_N_UTM, MAX_E_UTM, MAX_N_UTM]

The database uses UTM coordinates to refer to the precise location of a study area. This convention maintains consistency with NPS geographic information systems guidelines. UTM marks are provided on most recent USGS quad maps. A list of locations used in this database and their respective UTM coordinates and elevation is given in Appendix IV. To maintain consistency, new entries for these locations should use these coordinates.

For small features and point locations, enter only maximum north and maximum east, leaving others blank. For larger defined geographic areas use the minimum and maximum coordinates to define a square or rectangle around the study. For rivers and streams, enter the mouth only as a point location. If the location is too broad, uncertain, involves various separate locations or if the study does not involve specific locations, enter N/A in the first field and leave others blank.

Max/Min Elevation (2 fields 4 characters each) [MAX_ELEV, MIN_ELEV]

For studies with specific locations, indicate elevation in meters if such information is provided in the document (or can be obtained from the location data using a map). Enter this information in the min_elev field. If a range of elevations are found in the study enter the minimum and maximum figures in both fields.

Biotic Zone (30 characters) [BIOTICZONE]

This field refers to the individual biotic zone(s) in a park that a study occurs in. These are entered as 2-letter codes separated by a space and include:

AL alpine	DE desert	SA subalpine
PE pelagic	BE beach	GR grassland
MO montane	LF lowland forest	IT intertidal
ST steppe	TU tundra	AQ freshwater aquatic

Additional codes can be defined as needed

Data Availability (65 characters) [DATA_AVAIL]

This field refers to where the source document can be found. Be as precise as space allows for the description in this field. If the document is in the park, indicate at what office or facility. If outside the park, indicate also what town, etc. The idea is to provide enough information for a user to be able to retrieve the document. If additional copies of a document are later found in other locations, add these to the previously entered record/s.

Scale (9 characters) [SCALE]

If mapped data are provided in the document, and a scale is given, enter in the form of 1:xxx,xxx. If more than one map is presented in the document and different scales are used, enter und. If a map is presented, but it is not possible to determine the scale, also enter und.

Computer and Software (2 fields 1 and 15 characters respectively)
[COMPUTER, SOFTWARE]

Enter Y if a computerized data set is available. If known, specify the software package used (e.g. dBASE, SPSS). If computerized but the software is not specified in the document, enter und.

Data Type (50 characters) [DATA_TYPE]

Describes elements or the nature of the data in the report. For example, entries in this field might read "includes 3 tables or 4 maps or several photographs.

Distribution (2 characters) [DISTRIBU]

Indicates whether, and how, the data was distributed. Codes are divided into three main categories: in-house documents and reports, materials released to the public, and "other".

IN-HOUSE

- 01 NPS documents (memos, proposals)
- 02 NPS reports (completed work)
- 03 NPS collections (objects, specimens)
- 04 Non-NPS government agency sources)
- 05 Non-governmental sources
- 06 Original data
- 07 Topical files (collections of misc. data on subject)

FOR PUBLIC DISTRIBUTION

- 09 Public, NPS pamphlets, brochures, handouts
- 10 Public, NPS publications (including EIS, EA, master plans)
- 11 Public, cooperating association publications (including books, pamphlets)
- 12 Public CPSU reports
- 13 Public, non-NPS government publications (e.g., USFS)
- 14 Public, non-governmental publications (e.g., commercial publishers, non-profit organizations, universities)
- 15 Public, thesis, dissertations
- 16 Public, professional (refereed) journals
- 17 Public, non-refereed, non-professional or popular journals

OTHER

- 20 Other (e.g., student papers, senior theses)

Repeatable (1 character) [REPEATABLE]

This field provides an estimate of how repeatable or easily a study can be duplicated. It is particularly pertinent to studies in which one can relocate the plots used. Codes are as follows, leave field blank if unknown.

Y = yes N = no M = marginally repeatable

Federal Status, State Status, Park Status (3 fields, 1 character each)
[F_STATUS, S_STATUS, P_STATUS]

These fields refer to the status of a species respectively as either:

E on the federal, state or park endangered list
T on the federal, state or park threatened list
S on the federal, state or park sensitive list
M on the federal, state or park monitoring list

Mg-Concern (20 characters) [MG_CONCERN]

Species or situations which are of specific management concern to a park. These are 2-letter codes separated by a space and include the following:

EX for exotic species EN for endemic species
HA for harvested species XT for extinct species
MI for migratory species CP for contaminated and/or polluted
HS for health and safety

Funding (2 fields 2 characters each) [FUNDING1, FUNDING2]

Refers to the source of funding for a study or project. Two fields are provided, each with space for a two-digit code. This information is generally placed in the database by park resource management personnel.

Resource Management Element (40 characters) [RES_MAN_EL]

These are project codes assigned by each park as needed in their management plans. The lists are not intended to be exhaustive lists of all resources - just resources for which there are management related research or activities planned. Codes for natural resource elements begin with the letter N- and a number. Cultural resource element codes have a C-, followed by a number. If no code is appropriate leave the field blank.

Serviss 1 and Serviss2 (2 fields 3 characters each) [SERV_ISS1, SERV_ISS2]

This field refers to codes for servicewide issues from the new resource management guidelines. This field is generally filled in by park personnel.

Comments (2 fields 65 characters each) [COMMENTS1, COMMENTS2]

Use this as a place to continue lengthy entries in other fields, or to provide additional important details about the document. If a continuation from another field, make this clear by ending the overflowing field with [see Comments], and starting the Comments field with, for example, [Title cont.].

Notes/Remarks (memo field) [NOTES]

This special field allows one to append to a record more extensive text than the record itself allows. A word processing file linked to that specific record is invoked by moving the cursor into the field labelled "notes", and pressing Ctrl-PgDn (Ctrl-Fn-PgDn on the portable). We have used this to list photographs, files, artifacts, maps, and other sets of materials that are too time and space consuming to enter as separate records. Save the Notes entry by pressing Ctrl-W, before returning to the main entry screen with Ctrl-PgUp.

Appendix II. Codes for Resource Categories and Subcategories

Categories	Subcategories
01 ATMOSPHERIC METEOROLOGIC	00 general
	01 atmospheric processes (photochemical oxidation, cloud formation, etc.)
	02 climate, weather (general)
	03 wet deposition (acid ppt., snow chemistry, snow surveys, etc.)
	04 dry deposition
	05 temperature
	06 wind
	07 microclimate
	08 air (general)
	09 visibility
	10 purity
	99 other
	02 GEOLOGIC
01 geologic processes (seismic events, glaciation, orogeny, volcanism, erosional processes, rockfall)	
02 minerals	
03 rock types (incl. igneous, metamorphic sedimentary, and specific types of)	
04 formations (anticlines, synclines,)	
05 landforms & features (dunes, blowouts, moraines, cirques, canyons, caves, glaciers, islands, shorelines, floodplains)	
06 soil	
07 fossils	
99 other	
03 HYDROLOGIC	
	01 hydrologic processes (flooding, currents, wave action, tides, etc)
	02 ground water
	03 springs (general)
	04 hot springs, thermal features
	05 cold springs
	06 streams, rivers
	07 lakes, reservoirs
	08 ocean
	09 water quality
	99 other

04 BIOLOGIC	00 general
05 PLANTS, FUNGI, ALGAE	00 general 02 lichens 03 bryophytes 04 algae 50 other 51 vascular: club mosses, ferns, conifers, flowering plants
06 ANIMALS	00 general 01 invertebrates 03 brachiopods/molluscs 04 insects 20 other 21 vertebrates (general) 22 fish 23 herps 24 amphibians 41 birds general 42 raptors 59 other birds 61 mammals (general) 62 pinnipeds 63 carnivores 64 ungulates 65 others: insectivores, bats, lagomorphs, rodents
07 BIOLOGIC PROCESSES	00 general 01 competition 02 herbivory 03 parasitism 04 predation 05 succession 06 symbiosis 07 plant development 08 plant reproduction 09 erosion due to animal use 99 other
08 ECOSYSTEM PROCESSES	00 general 01 fire 02 nutrient/mineral cycling 03 energy transfer 04 gas exchange 05 natural disturbance 99 other

09 ANTHROPOGENIC

- 00 general
- 01 adjacent lands
- 02 archaeologic
- 03 boundary
- 04 historical (cultural legislation policy)
- 05 general (CFR, NEPA, CAA, CWA, etc.)
- 06 NPS-specific
- 07 park-specific
- 08 native cultural
- 09 EA's and EIS's
- 10 planning documents (DCP, RMP, etc.)
- 11 administrative history
- 12 legislative history
- 13 IPM program
- 30 other
- 31 visitor use impact data
- 32 other visitor use data
- 33 revegetation studies
- 34 natural history, visitor guides
- 35 maps of trails and visitor facilities

1 Note: "General" = covers all or several categories or subcategories. "Other" = a single specific subcategory not already listed.

Code entries in the field "Categories" in the database as follows: e.g., 01-03 02-05 etc. for as many categories and subcategories that apply.

Appendix III. LIST OF KEYWORDS USED IN THE MORA DATABASE BY SUBJECT MATTER

ANIMALS

General:

aerial census, aerial survey, amphibian, anatomy, animal, aquatic, behavior, biological, biology, bird, breeding, browse, carrying capacity, competition, density, disease, distribution, endangered, endemic, exclosure, exotic, extinct, fauna, feeding behavior, feral, field guide, food, forage, grazing, growth, habitat, habits, harvest, hunting, inventory, key, mammal, migration, morphology, nutrient, observation, occurrence, physiology, pellets, population, population trends, range, rangeland, rare, rehabilitation, reproduction, reptile, sampling, scat, sex, species, tag, tagging, terrestrial, threatened, trap, trapping, vertebrate, wildlife, winter range,

Mammals:

bear, beaver, bighorn sheep, black bear, boar, chipmunk, cougar, deer, elk, Eutamias, goat, gopher, ground squirrel, heather vole, llama, mammal, mountain goat, mouse, pika, rabbit, raccoon, red fox, small mammal, vole,

Birds:

aquatic, banding, barred owl, bird, hummingbird, jaegar, great grey owl, grouse, peregrine falcon, pomarine jaegar, ptarmigan, sooty grouse, spotted owl,

Fish:

charr, creel census, fish, fishing, fishery, limnology, stocking, stomach contents, trout, whitefish,

Reptiles & Amphibians:

Ambystoma, amphibian, herpetofauna, larva, neoteny, reptile, salamander,

Invertebrates:

aphid, arthropod, arthropod fallout, balsalm woolly aphid, benthos, butterfly, bumblebee, emergence, ice worm, infestation, insect, invertebrate, larva, pest, plankton, spider, worm, zooplankton, Acheta, Bombus, Diptera, Grylloblatta, Hedriodiscus, Orthoptera, Trichoptera,

ENVIRONMENTAL

acid rain, air quality, backcountry management, bacteria, biological, biology, chemical, climate, climatic trends, coliform, damage, discharge, disease, ecology, ecological, ecosystem, ecosystem dynamics, energy balance, environment, environmental, environmental assessment, environmental impact, erosion, evaluation, fecal, fine particulates, flood, fire danger, Giardia, hazard, heavy metal, human, human impact, human use, human waste, hydrology, ice, impact, infestation, lake, landscape, land use, mapping, map, microbe, monitoring, parameters, pH, pollutant, pollution, population, precipitation, natural, natural resource, noncompliance, resource, runoff, scenery, scenic value, snow, snowmelt, waste, waste management, water, water chemistry, water quality, weather, wind

PLANTS

Species:

alder, algae, blister rust, diatom, Douglas fir, fungi, hemlock, lichen, moss, Pacific silver fir, plankton, pine, noble fir, silver fir, true fir, Festuca, Pedicularis, Polemoniaceae, Thalictrum, Xerophyllum,

General:

abundance, aquatic, bacteria, biogeography, blister rust, botany, browse, carrying capacity, cellulose, checklist, classification, collection, colonization, communities, community, composition, conifer, coniferous, core, count, cover, deciduous, dendrochronology, density, disease, distribution, disturbance, ecology, elevation, emergence, endangered, endemic, exotic, fellfield, fern, field, flora, forest, germination, growth, habitat, harvest, herbaceous, herbarium, herb, increment bore, infestation, invasion, inventory, key, lichen, macrofossil, meadow, microbe, microfungi, moisture, moss, mulch, natural history, nitrogen, nitrogen fixation, nutrient, occurrence, old-growth, overstory, paleoecology, palynology, pest, phenology, phenotype, plankton, plant, plot, pollen, pollination, population, primary productivity, rangeland, rare, reproduction, respiration, restoration, revegetation, seed, seeding, seedling, sensitive, shrub, species, specimen, sporocarp, succession, survey, terrestrial, threatened, timber, trampling, tree, tree ring, understory, variation, vegetation, vegetation type, vegetation zone, windthrow,

ECOLOGY

Habitats:

alpine, avalanche track, benthos, coniferous, fellfield, forest, gravel bar, ground, habitat, hot spring, ice, lake, meadow, rangeland, riparian, river, snowfield, subalpine, water, zone,

General:

abundance, aeolian, age classes, baseline, biogeography, biological, biology, biomass, carrying capacity, census, classification, climate, C:N ratio, communities, community, composition, core, count, cover, density, disease, distribution, disturbance, diversity, ecology, ecosystem, ecosystem dynamics, elevation, energy balance, exotic, fire, growth, habits, human, increment bore, insularity, invasion, limnology, monitoring, natural, natural history, natural resource, observation, occurrence, overstory, parameters, phenology, pollination, population, primary productivity, revegetation, sampling, snowfield, species richness, succession, survey, thermophilic, understory, vegetation,

PHYSICAL SCIENCES

Chemistry:

aluminum, anion, acid, arsenic, carbon, cation, chemical, chemistry, chlorine, C:N ratio, copper, dioxide, hazard, heavy metal, hydrogen sulfide, ice, ion, isotope, isotopic dating, lead, limnology, nitrogen, organic, oxygen, pH, phosphate, physical, properties, radio-carbon, silica, silicate, sulfate, water, water chemistry, water quality,

Hydrology/Limnology

acidification, bacteria, bathymetry, coliform, depth, discharge, drainage, erosion, flood, flow, flow rate, Giardia, gravel bar, ground water, hot spring, humidity, hydroelectricity, hydrology, hydrothermal, ice, ice cave, ice crystal, ice worm, lake, limnology, mass, meltwater, mineral spring, moisture, outburst flood, precipitation, riparian, river, runoff, sediment, snow, snow depth, snow pack, snowfall, snowfield, snowmelt, spring, stream, streamflow, stream gradient, supply, thermal activity, turbidity, volume, waste, waste management, water, water chemistry, water resource, water structure, water quality, watershed,

Geology:

accumulation, activity, age, ash, ashfall, avalanche, avalanche track, bedrock, cave, core, copper, crystal, dating, debris, debris flow, dendrochronology, depth, deposits, dry tilt, earth, earthquake, erosion, eruption, esker, features, feldspar,

field reversal, flood, flow rate, fossil, fuel, fumarole, geologic, geologic hazard, geologic history, geology, geomorphology, geomorphology, glacial, glacier movement, glacial debris, glacial deposit, glacier, gravity, hardness, hazard, hydrology, hydrothermal, ice, ice cave, ice crystal, lahar, lake, landslide, lava, lava flow, lead, lichenometry, lignitic, lithography, macrofossil, magma, map, mass budget, measurement, mine, mineral, mineral spring, mineralogy, mining, moraine, mountain, mountaineering, movement, mudflow, optical orientation, origin, paleomagnetism, petrography, physiographic, physiography, prediction, profile, pumice, pyroclastic flow, river, rock, rock fall, runoff, sediment, seismographic, silica, slope, speleology, spring, stratigraphy, stream gradient, structure, summit cave, surficial, surficial deposit, tectonic, tephra, terminus, thermal, thermal activity, thermograph, thermophilic, thickness, topography, volcanic, volcanic activity, volcanic debris, volcanic eruption, volcano, volume, water, water structure, zircon,

Soils:

arsenic, core, erosion, geology, glacier, nitrogen, profile, properties, sediment, silica, soil, soil chemistry, slope, stabilization, stratigraphy

Geography/Physiography:

biogeography, geography, glacier, glacial, lake, map, mountain, photogrammetry, physiographic, river, spring, stream, topography, topographic, valley,

Atmospheric:

acid rain, altitude, air, air quality, anti-wind, atmosphere, circulation, climate, climatic trends, extremes, fine particulates, heat balance, pollutant, precipitation, relative humidity, snowfall, snowfield, snow depth, snow pack, solar radiation, temperature, velocity, visibility, weather, wind, wind direction, wind speed,

SOCIAL SCIENCES

Visitors/Sociology:

activities, activity, anthropology, attitudes, behavior, camping, characteristics, compliance, cultural, cultural resource, demographics, group, human, human impact, human use, human waste, impact, interpretive, interpretative activities, interpretation, interview, narrative, noncompliance, recording, recreation, services, skiing, social trail, sociology, trip, use, visitor, visitor impact, visitor services, waste, History:

archaeology, archaeological, archaeological site, architectural, architecture, artifact, autobiography, chronology, cultural, development, ethnographic, ethnography, ethnology, excavation, exploration, historic, historic structure, history, homesteader, Indian, interview, inventory, land use, legend, legislation, legislative, memoir, mine, mining, mountaineering, narrative, oral history, park establishment, photograph, Rainier National Park Co., rehabilitation, restoration, road, settlement, shelter, trail,

Economic:

assessment, claim, copper, communities, community, development, economic, economic impact, fishing, fishery, fungi, forest, grazing, growth, harvest, homesteader, hot spring, hunting, hydroelectricity, impact, lead, mineral, mineral spring, mineralogy, mine, mining, resource, road, timber, transportation,

MANAGEMENT/ADMINISTRATION

Facilities:

area, architecture, architectural, backcountry management, campground, campsite, structure, construction, facilities, historic structure, properties, road, social trail, trail, waste management,

Fire:

behavior, danger, dynamics, fire, fire behavior, fire danger, fire dynamics, fire history, fire management, fire research, fire suppression, fuel, hazard, lookout, management, mapping, research, suppression,

Resources/Areas:

area, backcountry, historic, Research Natural Area, resource, scientific reserve, water, wilderness,

General:

administration, administrative, administrative history, boundary, claim, classification, compliance, development, environmental assessment, environmental impact, expenditure, goal, growth, hunting, impact, incident, infrastructure, interest group, interpretive, interview, inventory, land management, land status, land use, legislation, legislative, maintenance, management, management plan, monitoring, mountaineering, noncompliance, objective, park establishment, permit, plan, planning, policy, policies, procedure, safety, sanitation, services, staff, statistics, transportation, visitor use, visitor impact,

RESEARCH

Study Types & Methodologies:

aerial census, aerial photograph, aerial survey, banding, baseline, bathymetry, bibliography, biogeography, census, classification, collection, core, count, database, demographics, dendrochronology, electrofishing, environmental assessment, exclosure, increment bore, infrared, interview, inventory, isotopic dating, key, mapping, modelling, monitoring, observation, ordination, plot, photograph, photogrammetry, prediction, radio-carbon dating, recapture, reconnaissance, remote sensing, recording, research, sampling, satellite telemetry, seismographic, simulation, stomach contents, stratigraphy, survey, telemetry, transect, trapping,

Measurements/Data Types:

abundance, age classes, carrying capacity, checklist, composition, cover, count, density, distribution, diversity, emergence, environmental impact, evaluation, extremes, field guide, flow rate, growth, habits, harvest, height, key, length, map, mass balance, measurement, microwave emission, modeling, monitoring, mortality, optical orientation, parameters, pH, profile, properties, sample, sampling, snow depth, snow pack, species richness, statistics, temperature, thermograph, turbidity, velocity, visibility, visitor, visitor use, volume, weight, wind speed,

MAPS

access, aerial photograph, campground, contour, earth, glacier, ice, lake, landscape, lookout, map, photogrammetry, profile, relief, river, road, section, stratigraphy, stream, structure, topography, topographic, trail, vegetation,

COLLECTIONS

artifact, collection, ethnographic, herbarium, museum, photograph, recording, slide,

OTHER

bibliography, transcript,

Appendix IIIA. ALPHABETIZED LIST OF KEYWORDS USED IN THE MORA DATABASE

A

abundance, access, accumulation, Acheta, acid, acid rain, acidification, activities, activity, administration, administrative, administrative history, aerial census, aerial photograph, aerial survey, aeolian, age, age classes, air, air quality, alder, algae, Alnus, alpine, altitude, aluminum, Ambystoma, amphibian, anatomy, animal, anthropology, anti-wind, aphid, aquatic, area, archaeology, archaeological, archaeological site, architecture, architectural, arthropod, atmospheric fallout, arsenic, artifact, ash, ashfall, assessment, atmosphere, attitudes, autobiography, avalanche, avalanche track,

B

backcountry, backcountry management, bacteria, banding, baseline, bathymetry, balsam wooly aphid, barred owl, bear, beaver, bedrock, behavior, benthos, bighorn sheep, bibliography, biogeography, biological, biology, biomass, biosphere reserve, bird, black bear, blister rust, boar, Bombus, boundary, breeding, browse, bumblebee, butterfly,

C

campground, campsite, camping, carbon, carbon monoxide, carrying capacity, cation, census, characteristics, chipmunk, charr, checklist, chemical, chemical composition, chemistry, chlorine, chronology, circulation, claim, classes, classification, climate, climatic trends, C:N ratio, coliform, collection, colonization, communities, community, competition, compliance, composition, conifer, coniferous, contour, construction, core, copper, cougar, count, cover, creel census, cryophylous, crystal, cultural, cultural resource,

D

damage, dating, database, debris, debris flow, deciduous, deer, demographics, dendrochronolgy, deposits, depth, density, development, diatom, Diptera, discharge, disease, distribution, disturbance, diversity, Douglas fir, drainage, dry tilt, dynamics,

E

earth, earthquake, ecology, ecological, economic, economic impact, ecosystem, ecosystem dynamics, elk, elevation, emergence, endangered, endemic, energy balance, environment, environmental, environmental assessment, environmental impact, erosion, eruption, esker, ethnographic,

ethnography, ethnology, Eutamias, evaluation, excavation,
exclosure, expenditure, exploration, extremes, exotic,

F

facilities, fauna, feature, fecal, feeding behavior, feldspar,
fellfield, fern, Festuca, field, field reversal, fieldwork,
field guide, fine particulates, fir, fire, fire behavior, fire
danger, fire dynamics, fire history, fire research,
fire suppression, fish, fishing, fishery, fixation, flood, flora,
flow, flow rate, food, forage, forest, fossil, fuel, fumarole, fungi,

G

geography, geologic, geologic hazard, geologic history,
geology, geomorphology, germination, Giardia, glacial debris,
glacial deposits, glacier, glacier movement, goat, goat,
gravel bar, grazing, great grey owl, ground, ground water,
group, grouse, growth, Grylloblatta,

H

habitat, habits, harvest, hazard, heat balance, heather vole,
height, hemlock, Hedriodiscus, herbaceous, herbarium, herb,
heavy metal, herbivory, herpetofauna, historic, historic structure,
history, homesteader, hot spring, human, human impact,
human use, human waste, humidity, hummingbird, hunting,
hydroelectricity, hydrothermal, hydrogen sulfide, hydrology,

I

ice, ice cave, ice crystal, ice worm, impact, increment bore, Indian,
infestation, infrared, infrastructure, Inocybe, insect, insularity,
interpretation, interpretive, interpretative activities, interview,
invertebrate, invasion, inventory, ion, isotope, isotopic dating,

J

jaeger

K

key,

L

lahar, lake, landscape, landslide, land management, land status,
land use, larva, lava, lava flow, lead, legend, legislation,
legislative, length, lichen, lichenometry, life zone, lignitic,
lithography, limnology, llama, lookout,

M

macrofossil, magma, maintenance, mammal management, management plan, map, mass balance, mass budget, meadow, measurement, meltwater, memoir, microbe, microfungi, microwave emission, migration, mineral spring, mineralogy, mineral, mine, mining, modeling, moisture, monitoring, moraine, morphology, moss, mountain, mountain goat, mountaineering, movement, mudflow, mulch, museum,

N

natural, natural history, natural resource, narrative, neoteny, nitrogen, nitrogen fixation, noble fir, noncompliance, nutrient,

O

objective, observation, occurrence, old-growth, Oligochaeta, optical orientation, oral history, origin, organic, Orthoptera, outburst flood, overstory, owl, oxygen,

P

Pacific silver fir, paleomagnetism, paleoecology, palynology, parameters, park establishment, pattern, Pedicularis, pellets, permit, pest, petrography, pH, phenology, photograph, photogrammetry, physical, physiology, physiography, pika, pine, plan, plankton, planning, plant, plot, Polemoniaceae, policy, pollen, pollination, pollutant, pollution, pomarine jaegar, population, population trends, precipitation, prediction, primary productivity, procedure, profile, properties, protection, Psathyrella, pumice, pyroclastic, pyroclastic flow,

Q

R

raccoon, radio-carbon, Rainier National Park Co., range, rangeland, rare, reconnaissance, recording, recreation, red fox, relative humidity, relief, rehabilitation, remote sensing, reproduction, reptile, research, Research Natural Area, resource, respiration, restoration, revegetation, riparian, river, road, rockfall, rock, runoff,

S

safety, salamander, salt, sample, sampling, sanitation, satellite telemetry, scat, scenery, scenic value, scientific reserve, section, sediment, seed, seeding, seedling, seedling, seismographic, sensitive, settlement, services, sex, shelter, shorefly, shrub, sign, silica, silver fir, simulation, size classes, skiing, slide, slope, small mammal,

small hydro, snow, snowfall, snowfield, snowmelt, snow depth, snow pack, social trail, sociology, soil, soil chemistry, solar radiation, sooty grouse, species, species richness, specimen, speleology, spider, spotted owl, sporogrocarp, spring, stabilization, staff, stand, statistics, stocking, stomach contents, stratigraphy, stream, stream gradient, streamflow, structure, subalpine, succession, sulfate, sulfur, summit cave, supply, suppression, surficial deposits, survey,

T

tagging, tectonic, telemetry, temperature, tephra, tephrochronology, terminus, terrestrial, Thalictum, thermal, thermal activity, thermograph, thermophilic, thickness, threatened, timber, topography, topographic, trail, trampling, transect, transcript, transportation, trap, trapping, tree, tree ring, trends, Trichoptera, trip, trout, true fir, turbidity, type

U

use,

V

valley, variation, vegetation, vegetation type, vegetation zone, velocity, vertebrate, visibility, visitor, visitor use, visitor impact, visitor services, volcano, volcanic, volcanic activity, volcanic debris, volcanic eruption, vole, volume,

W

water, water chemistry, water resource, water structure, water quality, watershed, waste, waste management, weather, weight, whitefish, wilderness, wildlife, wind, wind direction, wind speed, windthrow, winter range, worm,

X

Xerophyllum,

Z

zircon, zone, zooplankton,

activities (also use activity), age classes, attitudes,
characteristics, classes, climatic trends, communities (also
use community),
demographics, deposits, dynamics,
ecosystem dynamics, extremes,
facilities, features, fine particulates,
glacial deposits,
habits,
interpretative activities,
parameters, pellets, population trends, properties,
services, size classes, statistics, stomach contents,
surficial deposits,
trends,
visitor services,

Appendix IV.

ELEVATION AND UTM COORDINATES FOR LOCATIONS FOUND IN THE MORA DATABASE

LOCATION	ELEVATION (m)	UTM E min	UTM E max	UTM N min	UTM N max
Barn Flats	1693	5960	5970	51810	51820
Berkeley Park	1830-1952	5990	6005	51955	51968
Burroughs Mountain	2258	5975	6015	51940	51965
Butter Creek R.N.A.	1040-2116	5943	5995	51740	51785
Camp Muir	3107	5962		51868	
Carbon Glacier	1007-3264	5915	5940	51920	51990
Carbon River Valley		5830	5917	51990	52055
Colonnade Area	1678	5840	5920	51840	51930
Cowlitz Chimneys	3355	6030	6080	51870	51910
Eagle Peak Mining Claims		5900	5930	51760	51790
Emmons Glacier	1464-4270	5950	6020	51885	51930
Fan Lake	5400	6013		51837	
Glaciers (all)		5870	6090	51820	52000
Glacier Basin - Starbo Claims	1830	5970	6000	51910	51940
Grand Park	1708	5990	6020	52000	52035
Huckleberry Basin (Park)	1708-1952	6020	6040	51970	51990
Indian Henry's Hunting Ground	1574	5881	5898	51813	51837
Inter Glacier / Camp Shurman	2654-2898	5955	5980	51905	51930
Ipsut Creek Campground	800	5885		52030	
Kautz Glacier	2013-3660	5928	5943	51845	51880
Kautz Valley	634-4026	5860	5910	51750	51810
Longmire Complex	805-927	5905	5915	51765	51780
Longmire Headquarters	805	5908		51778	
Longmire Springs	830	5905	5908	51778	51780
Mt. Rainier - parkwide		5830	6185	51750	52060
Mt. Rainier summit firn caves	4392	5935	5955	51880	51895
Mowitch Lake	1502	5865		51985	
Muir Ridge (Panorama Pt - Camp Muir)	2157-3107	5960	5970	51835	51875
Muir Snowfield area	1932-3107	5960	5990	51830	51880
Nisqually Glacier	1586-4392	5940	5970	51810	51890
Nisqually River Valley	610-1464	5830	5970	51745	51840
Ohanapecosh Hot Springs	612	6100		51769	
Ohanapecosh Ranger Station	612	6093		51764	
Paradise Complex	1647-1850	5955	5970	51815	51830
Paradise Ice Caves	1952	5983		51843	
Paradise Inn	1647	5969		51823	
Paradise Meadow	1695-1932	5965	6005	51810	51835
Paradise - Muir Corridor	1932-3107	5960	5990	51815	51880
Paradise Park	1525-2288	5960	5970	51810	51840
Paradise River Drainage		5920	5980	51800	51830
Paradise Valley	1700	5950	5980	51790	51825

LOCATION	ELEVATION (m)	UTM E min	UTM E max	UTM N min	UTM N max
Paradise Visitor's Center	1850	5961		51815	
Reflection Lakes	1464	5970	5978	51798	51801
Shadow Lake	1464	6021		51964	
Sourdough Mountains		6020	6090	51960	52060
Spray Park	1708-1952	5880	5905	51950	51975
State Hwy. Maint. Sta. (White R.)		6115		51974	
Sunrise Area	1952	5990	6060	51940	52000
Sunrise Complex	1952	6010	6040	51960	51970
Sunrise Picnic area	1952	6024		51953	
Sunrise Ridge	1860	6060	6110	51960	52010
Sunshine Pt. Campground	634	5834		51765	
Sunshine Pt - Longmire	634-805	5830	5920	51750	51785
Tipsoo Lake area	1659	6125	6140	51910	51920
White River	1341				
White River Valley		6010	6040	51940	51960
White River Ranger Station	1307	6093		51955	
Yakima Park	1952	6023	6040	51964	51970

Appendix V. MOUNT RAINIER NATIONAL PARK MAP LIST 3/30/88

Longmire Library Map File:

- Fiske, R., C. Hopson, and A. Waters. n.d. Geologic map and sections of Mount Rainier National Park, Washington. 1:62,500.
- Fiske, R., C. Hopson, and A. Waters. 1964. Geologic map and section of Mount Rainier National Park, Washington. 1:62,500.
- Henderson, J. 1972. Mount Rainier National Park, vegetation types. 1:47,520.
- Henderson, J. 1975. Vegetation and trails of Paradise Park area of Mount Rainier National Park. 1:5,280.
- Meier, M. and A. Post. 1966. Glaciers and small ice patches. Scale und.
- Molenaar, D. 1953. Mount Rainier National Park. Scale und.
- Molenaar, D. 1965. Mount Rainier National Park "index map". Scale und.
- n.a. 1965. Untitled ["plastic map" of MORA]. 1:142,560.
- n.a. 1977. Nisqually Glacier, Washington. 1:10,000.
- NPS. 1977. Wilderness Plan, Mount Rainier National Park. 1:152,064.
- USFS. Var. dates. Snoqualmie National Forest. Various scales.
- USGS. 1959. Plan: Nisqually Glacier, 1951 and 1956, Mount Rainier National Park, Washington. 1:12,000.
- USGS. 1960. Plan: Nisqually Glacier, Washington (lower portion), 1931, 1936, 1941, and 1946. 1:9,600.

- USGS. 1961. Nisqually Glacier, 1951, 1956, and 1961, Mt. Rainier National Park, Washington. 1:12,000.
- USGS. 1966. Plan and profile: Nisqually Glacier, 1966, Mount Rainier National Park, Washington. 1:12,000.
- USGS. 1967. Mount Rainier National Park quadrangle. 1:62,500.
- USGS. 1970. Cross profiles: Nisqually Glacier, Mount Rainier National Park. 1:6,000.
- USGS. 1971. 7.5 minute quadrangles [MORA and vicinity]. 1:24,000.
- USGS. 1971. Mt. Rainier National Park, Washington, 18 x 29.5 minute topographic. 1:50,000.
- USGS. 1972. 7.5 minute quadrangle manuscripts [MORA and vicinity]. 1:24,000.
- USGS. Var. dates. Mt. Rainier National Park 15 x 25 minute quadrangles [MORA and vicinity]. 1:62,500.
- USGS and NPS. 1978. Nisqually Glacier, Mount Rainier National Park, Washington. 1:10,000.
- Various authors. Var. dates. [Old plans and maps - Mount Rainier]. Scales various.

Tahoma Woods Map Files:

- Civilian Conservation Corps. 1938. Vegetation type map of the master plan for Mt. Rainier National Park. 1:42,240.
- Crandell, D. 1973. Potential hazards from future eruptions of Mount Rainier, Washington. 1:250,000.
- Green Trails. n.d. Mt. Rainier east, WA - No. 270. Green Trails 15 minute series. 1:79,200.
- Henderson, J. 1972. Mount Rainier National Park vegetation map. 1:47,520.
- Henderson, J. 1975. Vegetation and trails of Paradise Park area of Mount Rainier National Park. 1:4,500.
- Holden, M. W. n.d. Elk transects: rough locations from Holden's notes. 1:62,500.
- Kertis, J. 1985. Jane Kertis' rare plant maps. Var. scales.
- n.a. 1962. Packwood, Wash. and proposed USFS addition. 1:62,500.
- n.a. 1973. Elk sightings. 1:62,500.
- n.a. 1973. Mt. Rainier elk study, 1973. 1:62,500.
- n.a. 1975. Mount Rainier backcountry trip planning map. Scale und.
- n.a. 1979. Franklin's forestry types. 1:24,000.
- n.a. 1979. Location of elk monitor plots - 1979. 1:50,000.
- n.a. 1982. 1982 elk concentrations, major transport areas, Mt. Rainier National Park. 1:50,000.
- n.a. 1982. Paradise meadows and trails. 1:4,800.
- n.a. 1984. Mountain goat summer distribution: Mount Rainier National Park. 1:50,000.
- n.a. 1985. Various untitled [photos and map of elk impacted areas]. 1:24,000.
- n.a. 1987. Mt. Rainier National Park, proposed 1987 boundary adjustments. Var. scales.

- n.a. [National Park Service] 1984. Wilderness plan, Mount Rainier National Park, Washington. 1:63,360.
- n.a. [National Park Service] 1984. Wilderness recommendation, December 1984, Mt. Rainier National Park. 1:50,000.
- n.a. [National Park Service] 1987. Wilderness boundary proposal August 1974, amendments 1987, Mount Rainier National Park, Washington. 1:63,360.
- n.a. n.d. Barn Flats oil spill maps. 1:250.
- n.a. n.d. Curtis ridge campsites and trails. 1:3,077.
- n.a. n.d. Ecosystem: basic topography map [with overlay]. 1:62,500.
- n.a. n.d. Fire events map. 1:41,666.
- n.a. n.d. Fuel hazard map. 1:62,500.
- n.a. n.d. GIS maps. Var. scales.
- n.a. n.d. Map of Muir Corridor 1978 thru 1986. 1:11,236.
- n.a. n.d. Mount Rainier National Park [historical boundary map]. 1:60,000.
- n.a. n.d. Ohanapecosh area mylars. Scale und.
- n.a. n.d. Rare plant maps. 1:24,000.

- n.a. n.d. Range type map, Mount Rainier National Park. 1:63,360.
- n.a. n.d. Untitled [backcountry campsite inventory maps]. Scales various.
- n.a. n.d. Untitled [fire management planning map]. 1:50,000.
- n.a. n.d. Untitled [locations of OSU forestry plots, reference stands, and thermographs]. 1:50,000.
- n.a. n.d. Untitled [map of wildlife observations in MORA]. 1:62,500.
- n.a. n.d. Untitled [maps of park fire management zones]. 1:50,000.
- n.a. n.d. Untitled [maps of social trails in Paradise meadows area]. 1:3,125.
- n.a. n.d. Untitled [MORA forest habitat types and stand age classes]. 1:50,000.
- n.a. n.d. Untitled [MORA topographic base map]. 1:63,360.
- n.a. n.d. Untitled [vegetation maps for Ohanapecosh elk enclosure]. Scale und.
- n.a. [Park staff] 1976. Photo points for IR photos taken of Ohanapecosh drainage, summer 1976. 1:50,000.
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