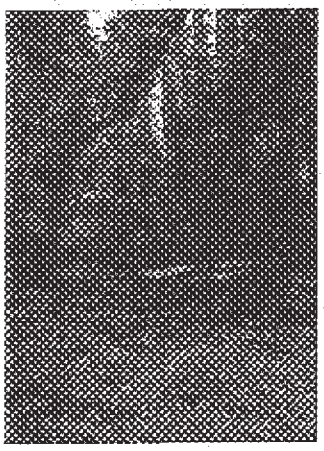
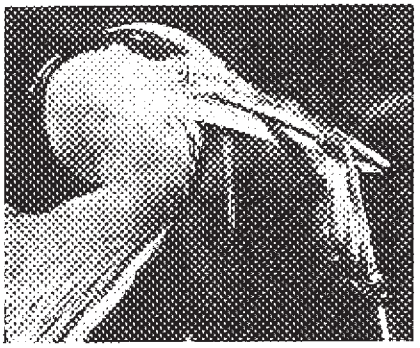
D-32



The Road Inventory of Muir Woods National Monument

national park service

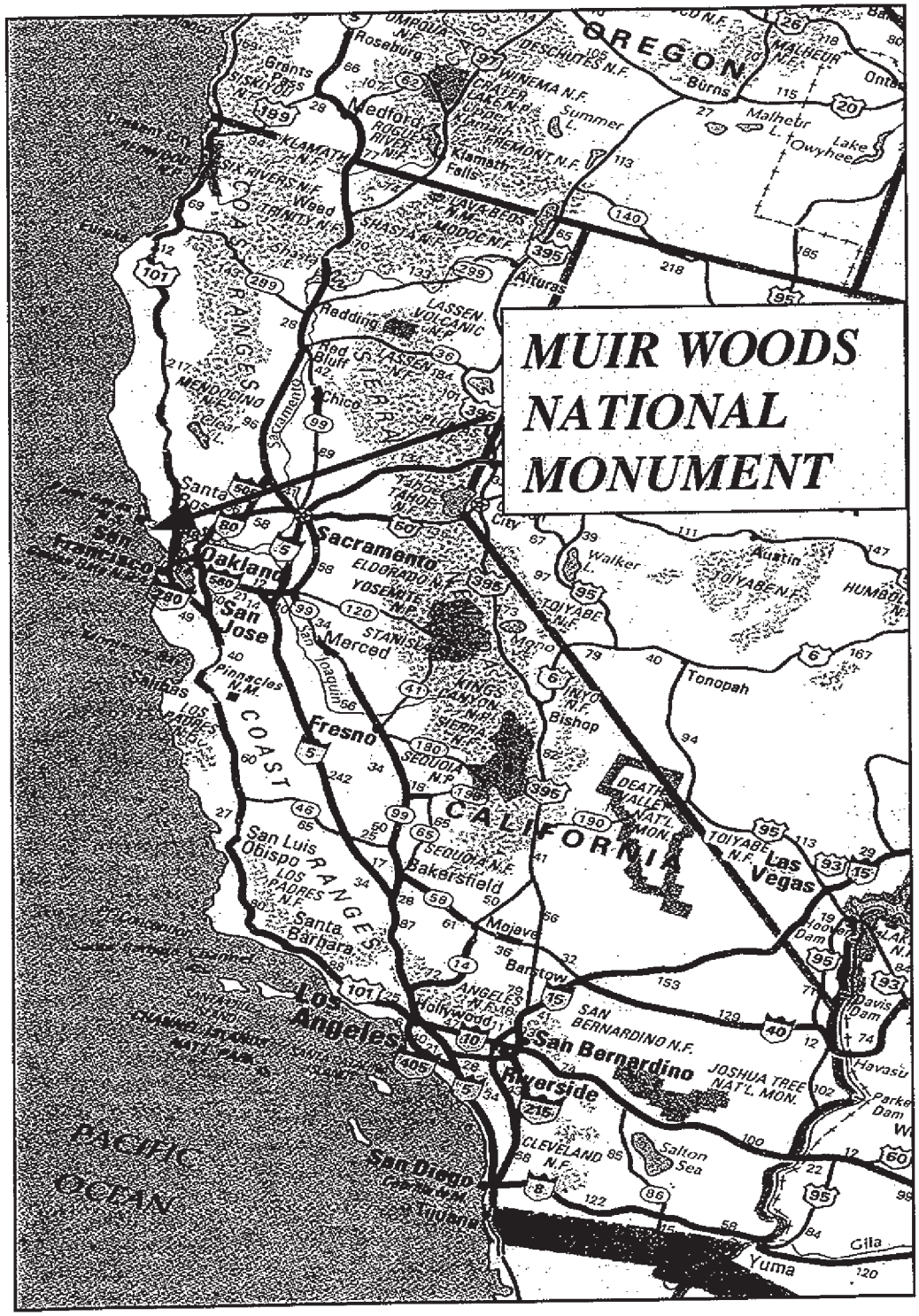




Road Inventory Program

Prepared by:
Federal Highway Administration
Eastern Federal Lands Highway Division
March 1999

DEPARTMENT OF TRANSPORTATION
UNITED STATES OF AMERICA

Muir Woods National Monument
in
California



CONTENTS

INTRODUCTION

Background: In July 1976, amended December 1980, the National Park Service (NPS) and the Federal Highway Administration (FHWA) entered into a Memorandum of Agreement (MOA), establishing the Road Inventory Program (RIP). The purpose of RIP, per the 1980 MOA, was to develop long range and short range costs and programs to bring NPS roads up to, or to maintain, designated standards; as well as provide a database so the NPS can revise their Maintenance Management System, if necessary. A supplementary Project Agreement, Number DTFH71-98-X-00005, was prepared and signed by the FHWA and the NPS to coordinate the project roles and responsibilities, funding requirements, and define the deliverables for the completion of Cycle 2 (January 1998 to January 2000).

Since 1984 the funding has been derived from the NPS FLHP (Title 23) planning funds, and coordinated by the National Park Service Park Facility Management Division. The need for a total road information database was mandated by the requirements for a continuing, comprehensive, and coordinated (3-C) planning process, and Maintenance Management System.

Federal Lands Highway (FLH) was assigned the task to inventory maintenance items (pavement type and quantities, location of culverts, ditches, guardrail, etc.), identify pavement distresses and evaluate the condition of existing park roads, summarize the data and findings in a report, and provide a videolog of the NPS roads system.

Objective: The objective of the RIP report is to provide NPS personnel at all levels, with the basic information needed for effective road and road system planning, management, operations, and maintenance.

These reports are prepared in standard format and content with comprehensive data analysis for each park, which will replace the old Brown Books. The data presented in each report will vary greatly from park to park, but the presentation of the report will be uniform in format and will become a seamless document throughout the NPS roads system, displaying site specific data for each park.

Scope: RIP is a national program coordinated by the Eastern Federal Lands Highway Division (EFLHD) of the FHWA. The FHWA goal for the paved park roads is to provide timely, cost effective, and accurate roadway inventories and pavement surveys of all the National Park Roads. Dissemination of this data to the NPS will provide them with a data base upon which they can develop a funding and maintenance management program to maintain roadway standards of the National Park System to prevent further deterioration over the next five years.

In an effort to track the condition of the park roads, a cyclic data collection and reporting process was implemented for all parks and regions. Monitoring the condition and system performance of the paved roads over time using a percent good, fair, and poor condition rating provided a realistic means of assessing the funding needs for road improvements. The pavement condition rating system is described in Section VI of this report. This pavement condition performance assessment will determine the level of paved park road deterioration throughout the park road system.

The report will include a Park Summary, a Park Summary Map, a Park Route Inventory, a Maintenance Features Summary, a Paved Route Condition Rating, and a Features Inventory. Also included is a listing of all unpaved routes in each park and various Appendices.

The FHWA RIP team will inspect, rate, inventory the roads, and prepare the final RIP reports for distribution to the NPS. All the field work is coordinated with the site specific park and the regional offices to ensure customer satisfaction. The FHWA Washington Office coordinates policy and prepares national reports and needs assessment studies for Congress.

The FHWA is responsible for all the data presented in this report. Anyone having questions or comments regarding the contents of this report are encouraged to contact the FHWA RIP Coordinator or the NPS RIP Coordinator in your Region.

James A. Amenta
FHWA/EFLHD
Technical Services, HTS-15
21400 Ridgetop Circle
Sterling, VA 20166
(703) 285-0076

Muir Woods National Monument
Summaries

PARK TOTAL SUMMARY ITEMS	TOTAL	DATE
PAVED ROUTE MILES	0.25	1/99
UNPAVED ROUTE ESTIMATED MILES	1.41	1/99
PAVED AND UNPAVED ROUTE MILES	1.66	1/99
PAVED PARKING LOT LANE MILES	1.87	1/99
PAVED ROUTE LANE MILES	0.41	1/99
PAVED LANE MILES	2.28	1/99

Note: Paved Lane Miles consists of parking lot areas which have been converted to lane miles using an 11-foot lane width and Paved Route Lane Miles.
RED LETTER denotes unpaved mileage

Estimated Unpaved Mileage Summary by Functional Class

F. C.	MILEAGE	PERCENTAGE
I	-	-
II	-	-
III	-	-
IV	-	-
V	0.66	48.81%
VI	0.75	53.19%
VII	-	-
VIII	-	-

Paved Route Miles and Percentages by Functional Class and PCR/SCR

F. C.	Excellent (95 - 100) MILES	%	Good (85 - 94) MILES	%	Fair (61 - 84) MILES	%	Poor (<= 60) MILES	%	TOTAL MILES
I	-	-	-	-	-	-	-	-	-
II	-	-	-	-	-	-	-	-	-
III	-	-	-	-	0.11	44.00%	0.14	56.00%	0.25
IV	-	-	-	-	-	-	-	-	-
V	-	-	-	-	-	-	-	-	-
VI	-	-	-	-	-	-	-	-	-
VII	-	-	-	-	-	-	-	-	-
VIII	-	-	-	-	-	-	-	-	-
Totals	-	-	-	-	0.11	44.00%	0.14	56.00%	**0.25**

Paved Lane Miles (Parking Areas) by Subjective Visual Rating

Rating	Excellent (95 - 100) LANE MILES	%	Good (85 - 94) LANE MILES	%	Fair (61 - 84) LANE MILES	%	Poor (<= 60) LANE MILES	%	TOTAL LANE MILES
	0.25	13.37%	1.62	86.63%	-	-	-	-	**1.87**

Cost to Improve to "Excellent" Condition

Based on Historical and Estimated Data

AWARD DATE	SOURCE	WORK PERFORMED	LENGTH (MILES)	COST	COST PER MILE	INITIAL CONDITION
1995-97	FHWA Projects	3-R (Resurfacing)	52.07	$3,776,479	$72,527	Good
1995-97	FHWA Projects	3-R (Resurfacing, Restoration, and Rehabilitation)	113.28	$30,610,000	$360,000	Fair
1985-98	FHWA Current Projects	4-R (Resurfacing, Restoration, Rehabilitation, and Reconstruction)	54.82	$56,600,000	$1,680,000	Poor

Based on the above table, the cost to improve existing condition miles to "Excellent" PCR are:

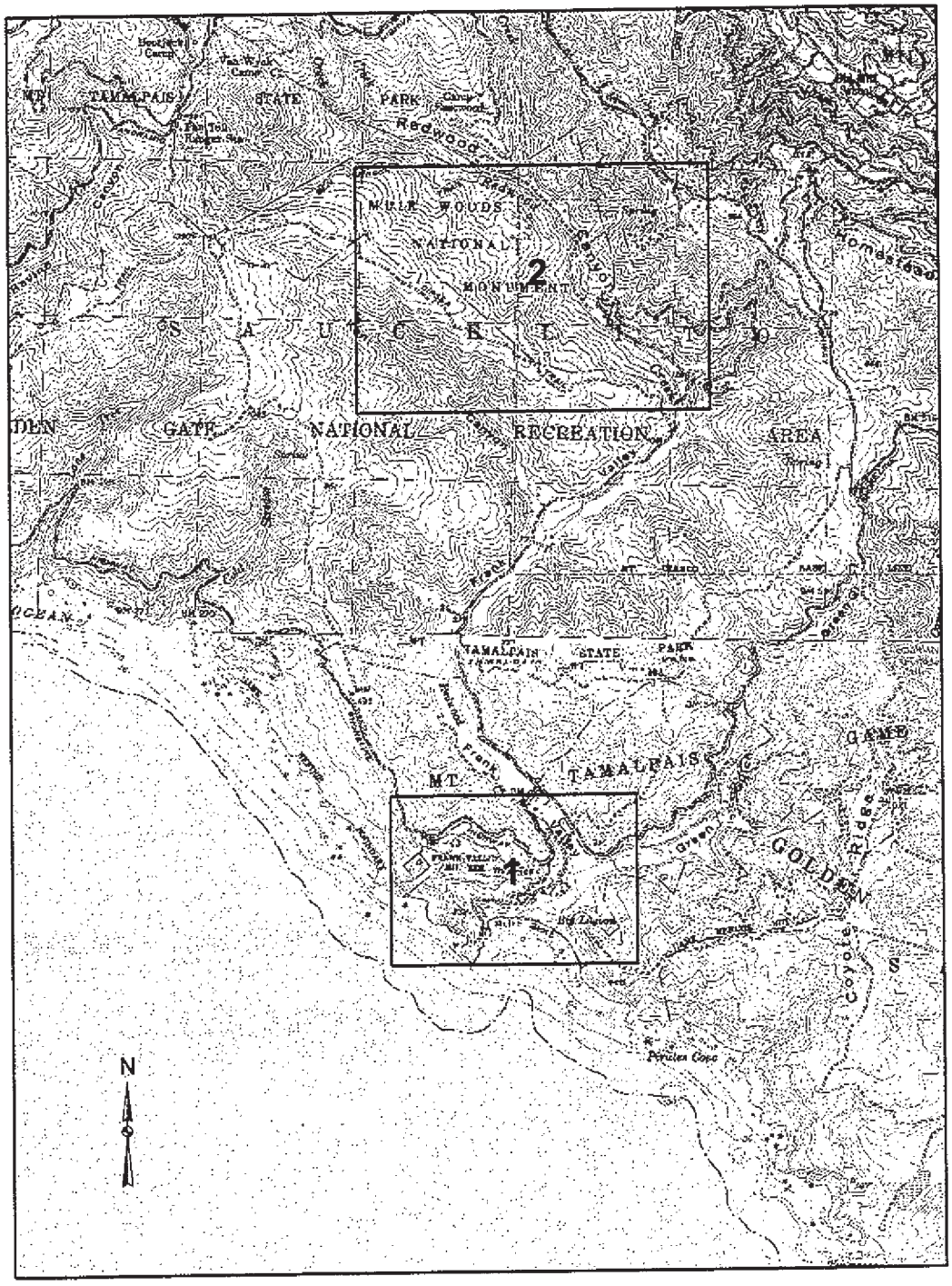
Existing Condition	Existing Miles	Estimated Cost to Improve
Good	0	$0
Fair	0.11	$39,600
Poor	0.14	$235,200
Totals	**0.25**	**$274,800**

MUIR WOODS NM - MUWO - 8180
SECTIONING AND SAMPLE UNIT LOCATION

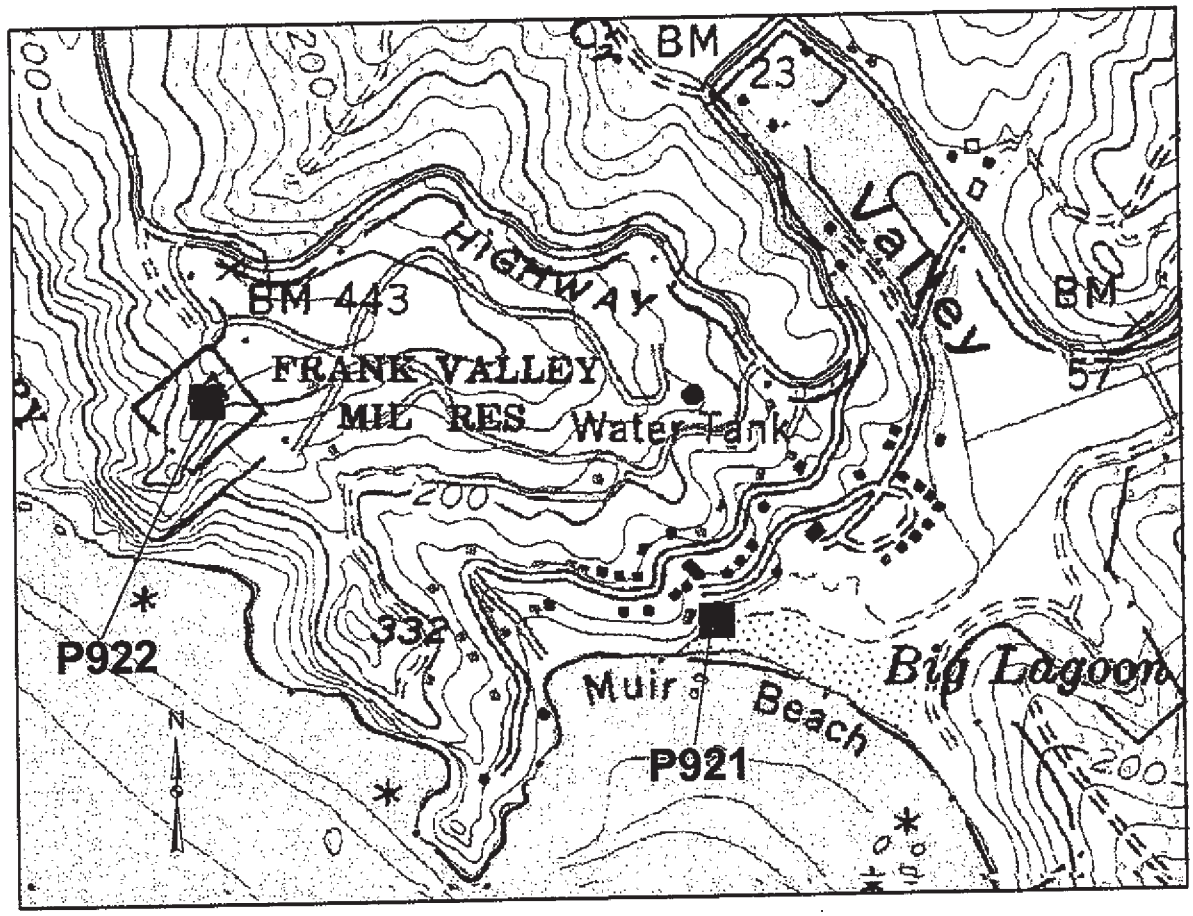
ROUTE NUMBER	SECTION NUMBER	SECTION START	SECTION END	SECTION LENGTH	SAMPLE UNIT NUMBER	SAMPLE UNIT START	SAMPLE UNIT LENGTH	PERCENT SAMPLED
203	1	0.000	0.107	0.107	1	0.040	200'	35.5
203	2	0.107	0.251	0.144	2	0.119	200'	26.4

PERCENTAGE OF PARK SAMPLED 30.28%

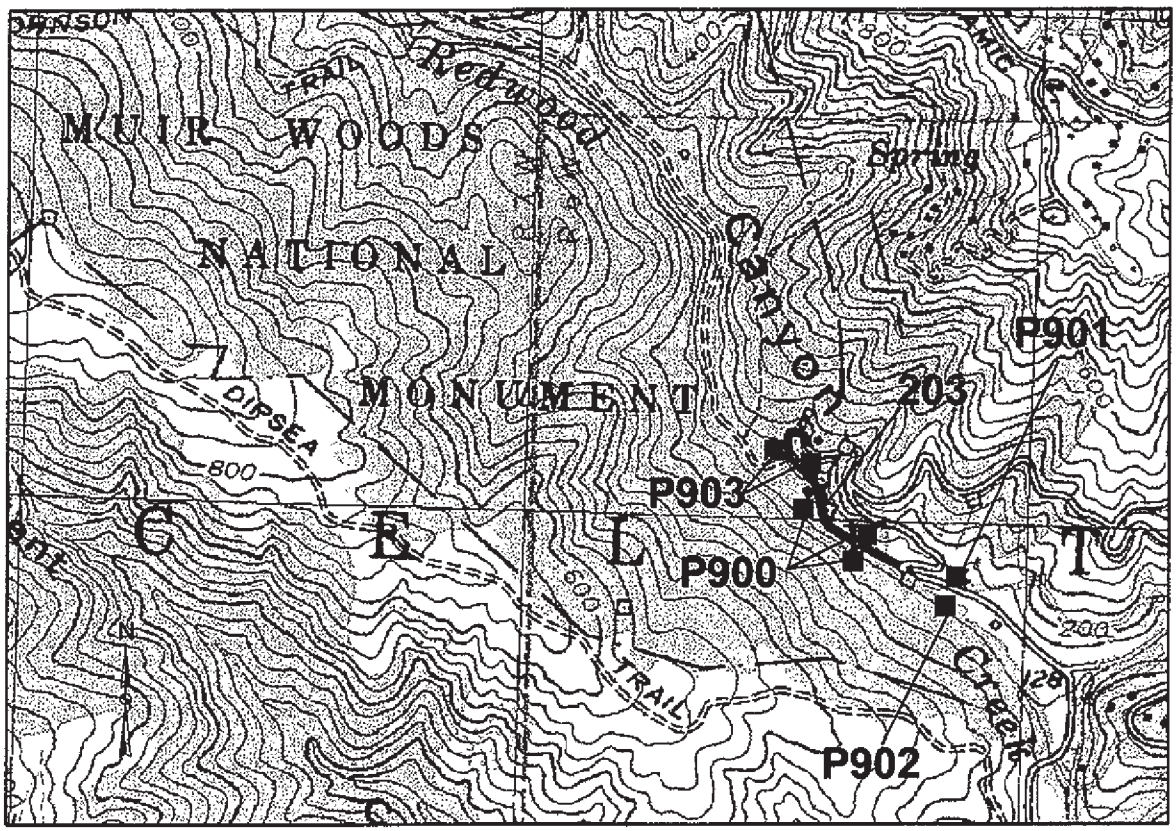
MUIR WOODS NATIONAL MONUMENT
ROUTE LOCATION
KEY MAP



MUIR WOODS NATIONAL MONUMENT
ROUTE LOCATION
AREA MAP #1



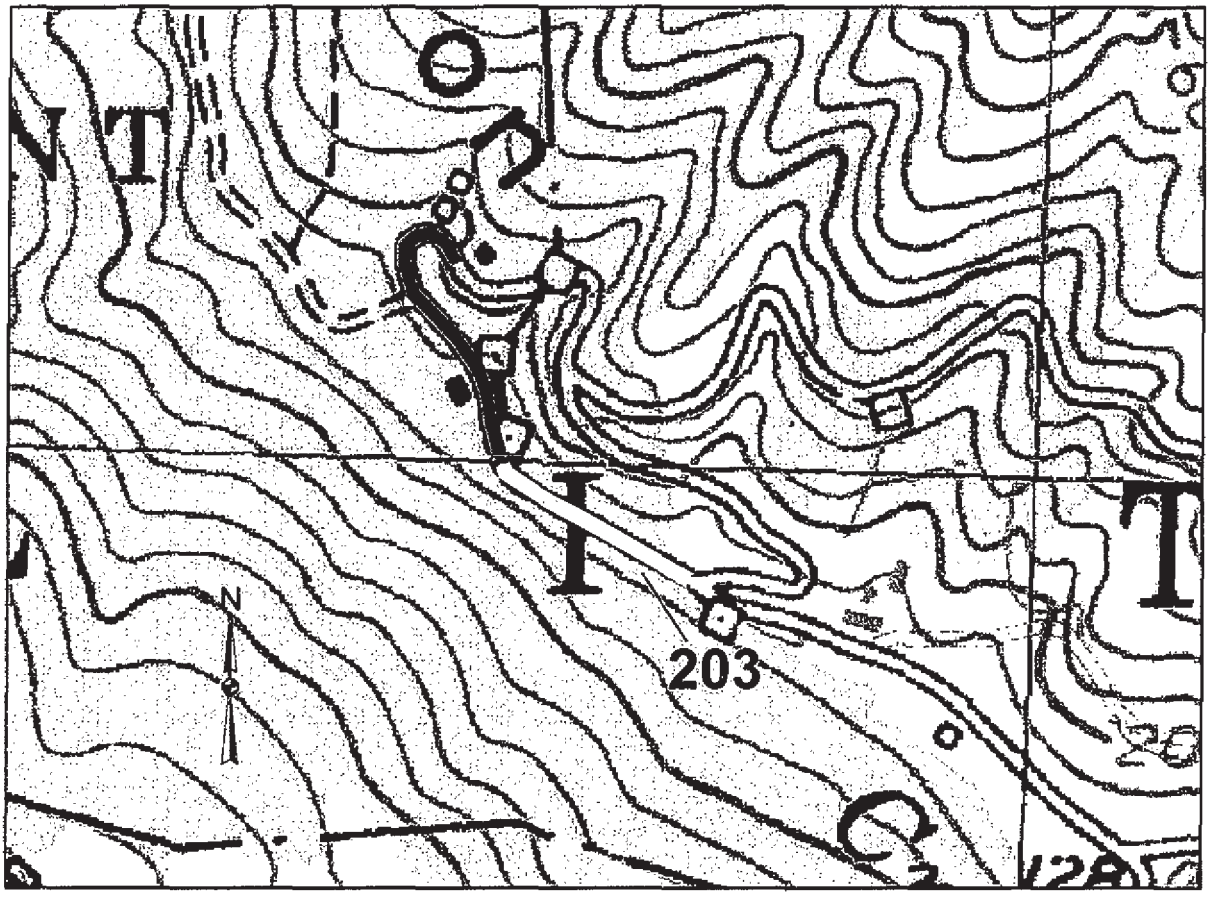
MUIR WOODS NATIONAL MONUMENT
ROUTE LOCATION
AREA MAP #2



0.5 0.25 0 0.5 1 MILE

MUIR WOODS NATIONAL MONUMENT
ROUTE CONDITION
PCR/DCR - Mile by Mile

FUNCTIONAL CLASSIFICATION III ROAD



PCR Excellent Good Fair Poor DCR Poor

* If the PCR rating is not available for a section, the SCR ration will be displayed.

500 0 500 1000 Feet

MUIR WOODS NATIONAL MONUMENT

ROUTE IDENTIFICATION LIST (NUMERIC)

GOLDEN GATE NRA - GOGA - 8180

Shading Color Key:	White = Paved Routes: Distress Surveyed	Yellow = Unpaved Routes: No Data Collected
	Grey = Paved Routes: No Distress Surveyed	Green = Unpaved Parking Area: No Data Collected
	Blue = Paved Parking Area: Data Collected	Red Denotes Estimated Mileage

FHWA Route Number	NPS Route ID Number	Route Name	Rte MI	Route Description	Paved Miles	Unpaved Miles	Lanes	Pave Class
100	YYY2	VISTA POINT RD		CONNECTOR RD (ACCESS TO PARK FACILITIES)			1	II
203	203	MUIR WOODS ACCESS RD	0.25	MUIR WOODS RD TO END	0.25		2/1	III
400	YYY3	CONLON AVE.	0.25	ADMINISTRATIVE ACCESS ROAD		0.25	1	V
401	YYY4	CAMINO DEL CANYON	0.25	ADMINISTRATIVE ACCESS ROAD		0.25	1	V
402	YYY5	GREEN HILL FIRE HOMESTEAD RD	0.25	RESTRICTIVE ROAD (NORMALLY CLOSED TO PUBLIC)		0.25	1	VI
403	YYY7	COASTAL FIRE RD MUIR BEACH	0.50	RESTRICTIVE ROAD (NORMALLY CLOSED TO PUBLIC)		0.50	1	VI
411	411	MUIR WOODS MAINT RD	0.16	RTE 203 TO MAIN AREA		0.16	1	V
900	XXX1	MUIR WOODS PARKING		RTE 203 TO VISITOR CENTER				
901	XXX7	MUIR WOODS OLD INN PARKING		MAINTENANCE AREA ACROSS RD BETWEEN #1 & #2				
902	XXX8	MUIR WOODS ANNEX PARKING		MUIR WOODS RD SOUTH OF RTE 203 ENTRANCE				
903	XXX9	ARAMARK-NPS ADMIN PARKING		RTE 203 ABOVE VISITOR CENTER PARKING (RTE 900)				
921	921	MUIR BEACH PARKING		SHORELINE HIGHWAY 1 TO PARKING				
922	922	MUIR BEACH OVERLOOK PARKING		SHORELINE HIGHWAY 1 TO PARKING				

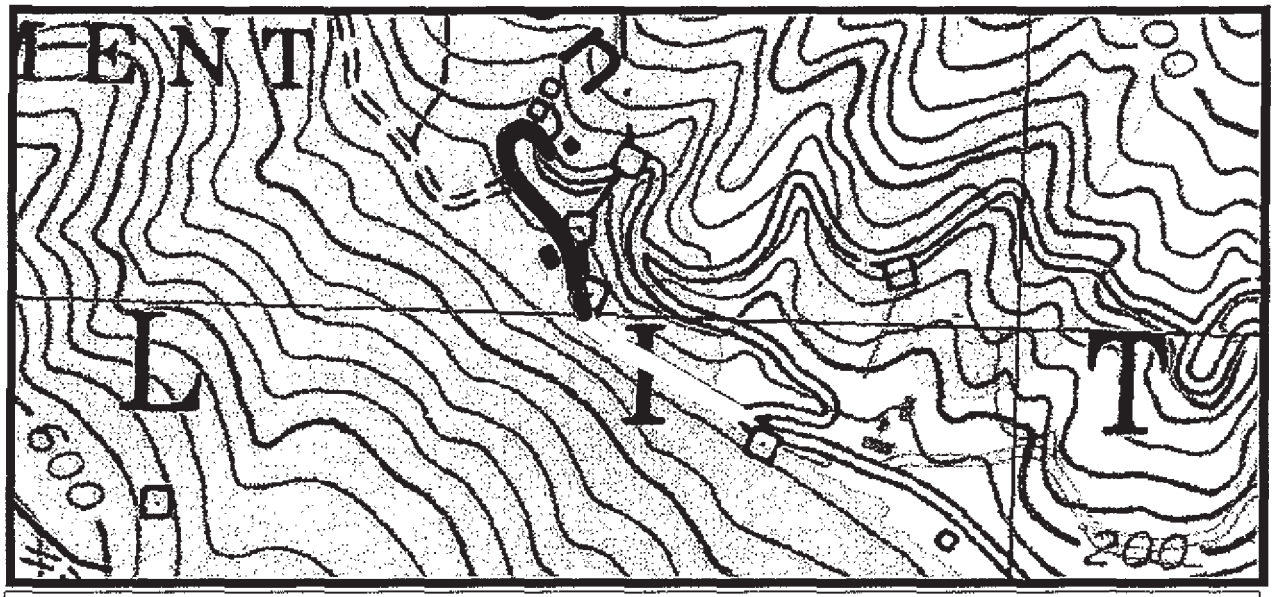
MUIR WOODS NATIONAL MONUMENT

ROUTE IDENTIFICATION LIST (ALPHABETIC)

GOLDEN GATE NRA - GOGA - 8180

Shading Color Key:	White = Paved Routes: Distress Surveyed	Yellow = Unpaved Routes: No Data Collected
	Grey = Paved Routes: No Distress Survey	Green = Unpaved Parking Area: No Data Collected
	Blue = Paved Parking Area: Data Collected	Red Denotes Estimated Mileage

FLMA Route Identification Number	NPS Route Identification Number	Route Name	Key Mi	Route Description	Paved Miles	Unpaved Miles	Lanes	Functional Class
903	XXX9	ARAMARK-NPS ADMIN PARKING		RTE 203 ABOVE VISITOR CENTER PARKING (RTE 900)				
401	YYY4	CAMINO DEL CANYON	0.25	ADMINISTRATIVE ACCESS ROAD		0.25	1	V
403	YYY7	COASTAL FIRE RD MUIR BEACH	0.50	RESTRICTIVE ROAD (NORMALLY CLOSED TO PUBLIC)		0.50	1	VI
400	YYY3	CONLON AVE.	0.25	ADMINISTRATIVE ACCESS ROAD		0.25	1	V
402	YYY5	GREEN HILL FIRE HOMESTEAD RD	0.25	RESTRICTIVE ROAD (NORMALLY CLOSED TO PUBLIC)		0.25	1	VI
922	922	MUIR BEACH OVERLOOK PARKING		SHORELINE HIGHWAY 1 TO PARKING				
921	921	MUIR BEACH PARKING		SHORELINE HIGHWAY 1 TO PARKING				
203	203	MUIR WOODS ACCESS RD	0.25	MUIR WOODS RD TO END	0.25		2/1	III
902	XXX8	MUIR WOODS ANNEX PARKING		MUIR WOODS RD SOUTH OF RTE 203 ENTRANCE				
411	411	MUIR WOODS MAINT RD	0.18	RTE 203 TO MAIN AREA		0.18	1	V
901	XXX7	MUIR WOODS OLD INN PARKING		MAINTENANCE AREA ACROSS RD BETWEEN #1 & #2				
900	XXX1	MUIR WOODS PARKING		RTE 203 TO VISITOR CENTER				
100	YYY2	VISTA POINT RD		CONNECTOR RD (ACCESS TO PARK FACILITIES)			1	II



Pacific Region MUWO :8180 : Muir Woods National Monument

ROUTE: 203 MUIR WOODS ACCESS ROAD TOTAL LENGTH: 0.25

Section Number	1	2			
Section Length (mi)	0.11	0.14			
AADT	NA	NA			
SADT	NA	NA			
ADT Date	NA	NA			
Cross Section Information					
Number of Lanes	2	1			
Paved Width (ft)	24	11			
Lane Width (ft)	12	11			
Shoulder Width (ft)	0	0			
Roadway Condition Information					
PCR (Pavement Condition Rating)	NA	NA			
Roughness Index	NA	NA			
SCR (Surface Condition Rating)	66	57			
Alligator Cracking	98	91			
Rutting Index	77	82			
Patching Index	87	79			
Transverse Cracking	97	100			
Longitudinal Cracking	95	96			
Shoulder Condition Rating	NA	NA			
Drainage Condition Rating	Good	Fair			

COMMENTS:

Photo # 01 Typical pavement section showing potholes.

Photo # 02 Alligator cracking upper area section 2.

MUIR WOODS NATIONAL MONUMENT

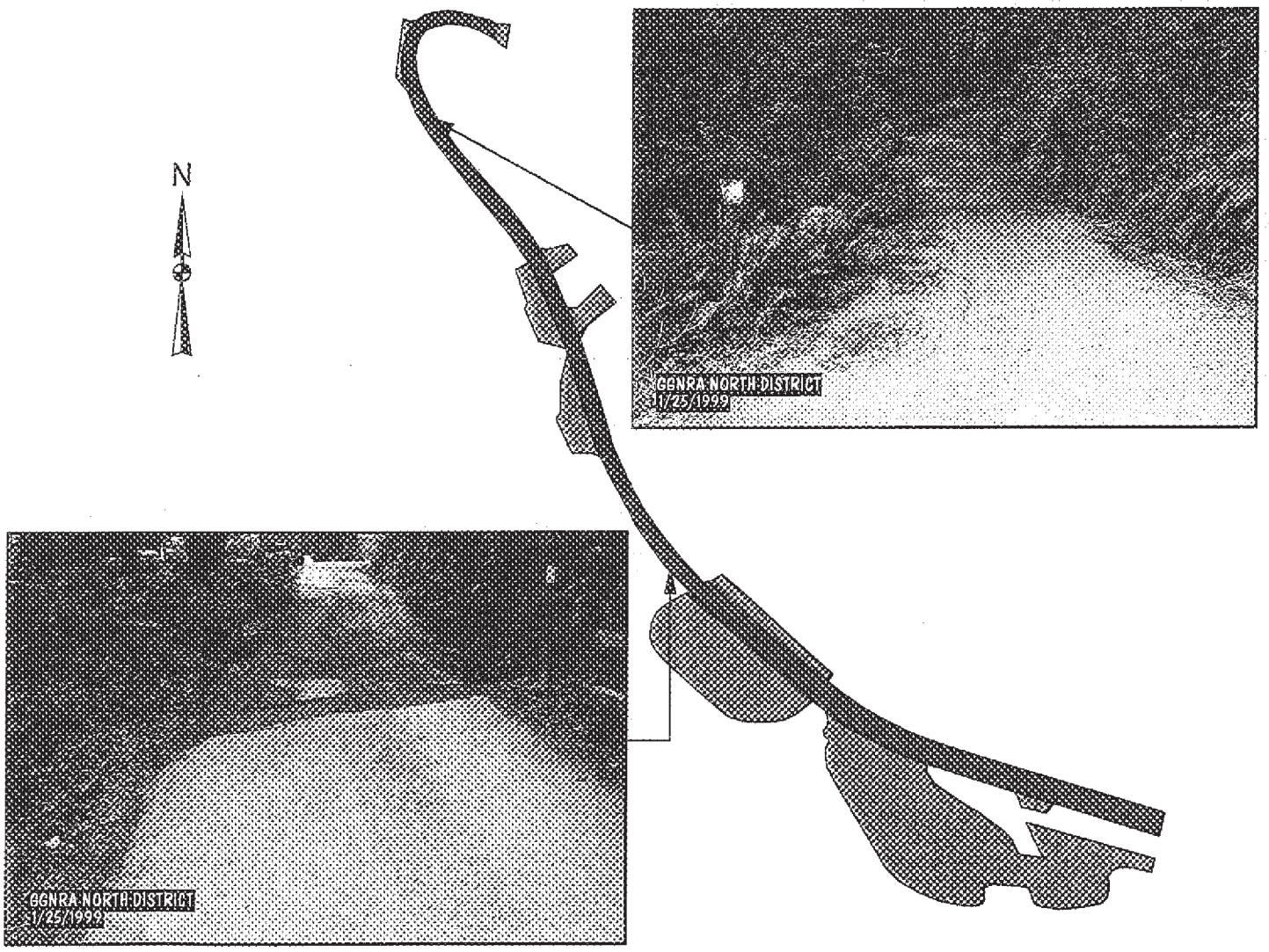
Route 203

MUIR WOODS ACCESS RD

MUIR WOODS RD TO END

Route	Date	Length (mi)	Width (ft)	Area (sq ft)	Lane Miles	Condition	Surface
203	990125	0.25	18	23,700	0.41	Fair	Asphalt

- Length and width will be used when applicable
- Lane miles are based on 11' lane widths



250 0 250 500 Feet

MUIR WOODS NATIONAL MONUMENT

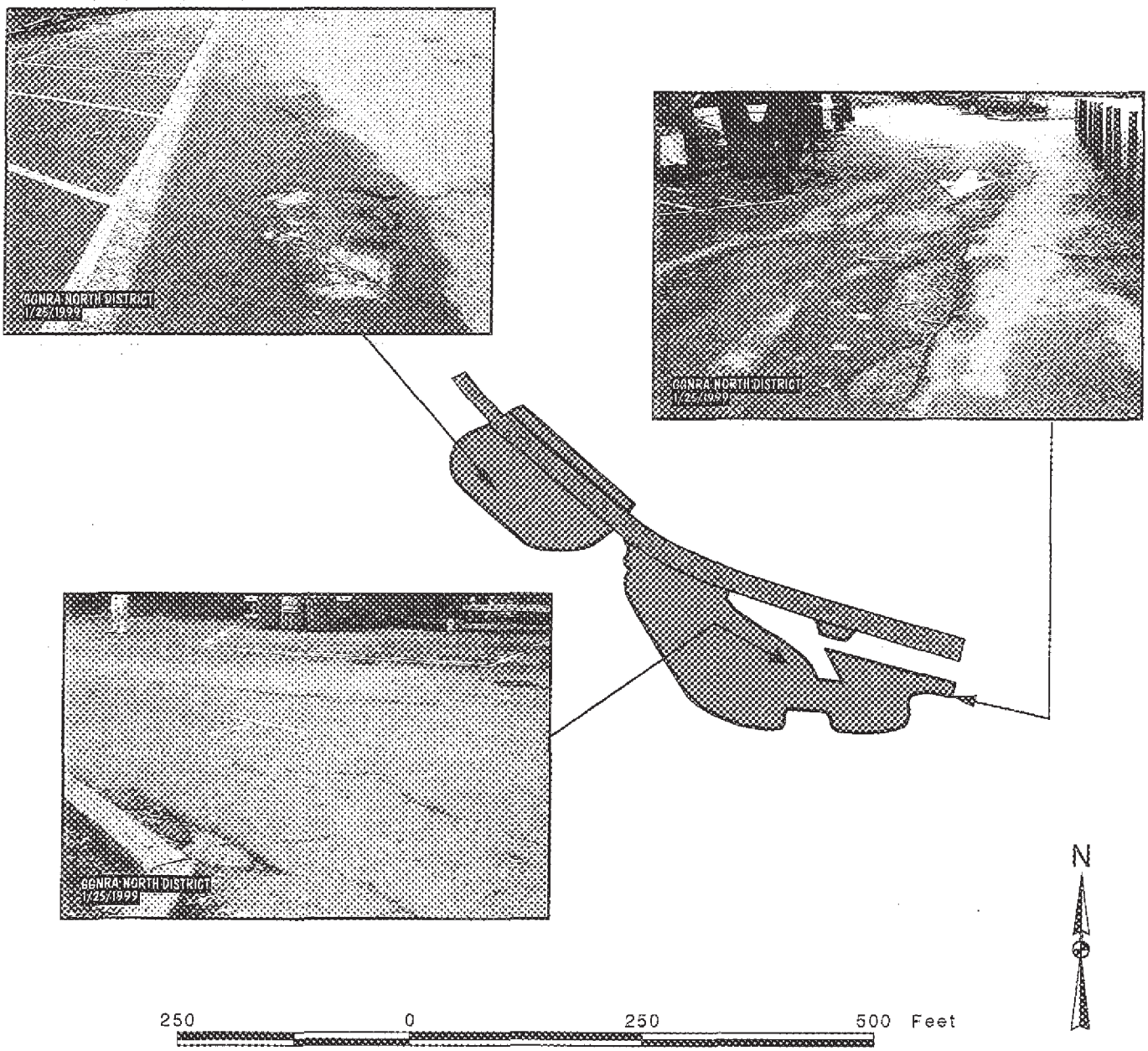
Route P900

MUIR WOODS PARKING

RTE 203 TO VISITOR CENTER

Route	Date	Length (mi)	Width (ft)	Area (sq ft)	Lane Miles	Condition	Surface
900	990125	-	-	43,497	0.75	Good	Asphalt

- Length and width will be used when applicable
- Lane miles are based on 11' lane widths



MUIR WOODS NATIONAL MONUMENT

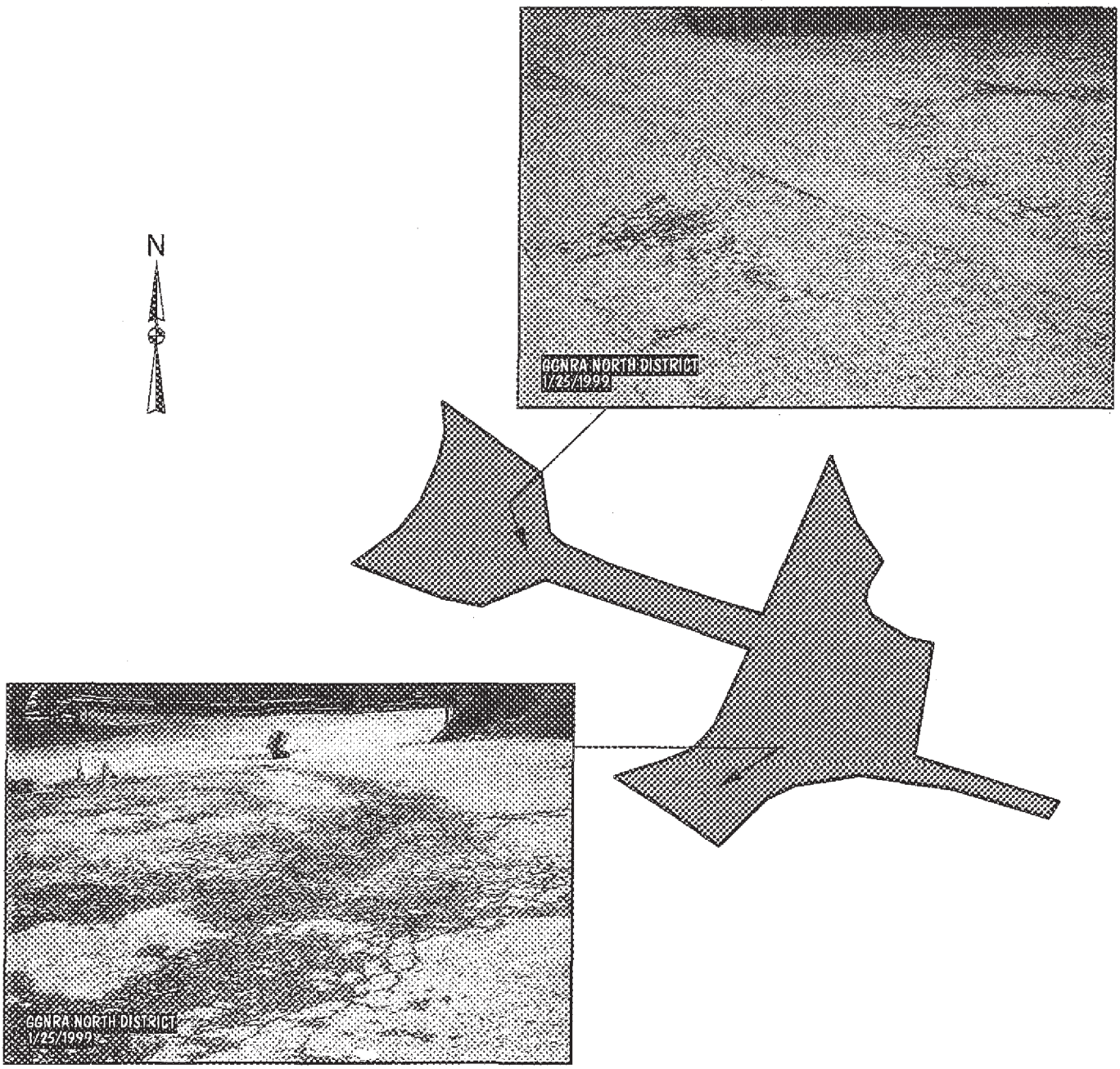
Route P901

MUIR WOODS OLD INN PARKING LOT

MAINTENANCE AREA ACROSS RD BETWEEN #1 & #2

Route	Date	Length (mi)	Width (ft)	Area (sq ft)	Lane Miles	Condition	Surface
901	990125	-	-	12,523	0.22	Good	Asphalt

- Length and width will be used when applicable
- Lane miles are based on 11' lane widths



MUIR WOODS NATIONAL MONUMENT

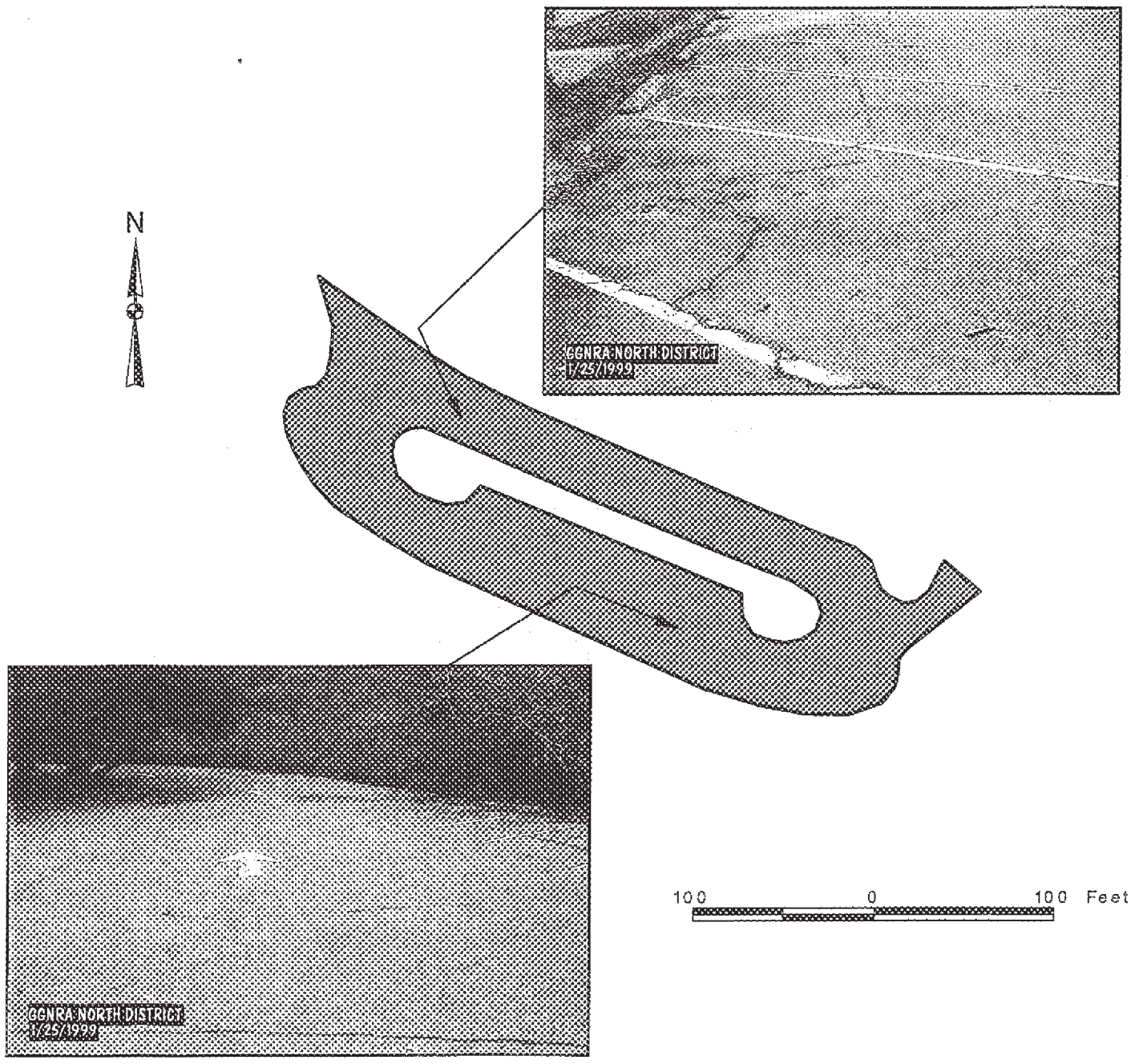
Route P902

MUIR WOODS ANNEX PARKING

MUIR WOODS RD SOUTH OF RTE 203 ENTRANCE

Route	Date	Length (mi)	Width (ft)	Area (sq ft)	Lane Miles	Condition	Surface
902	990125	-	-	30,429	0.52	Good	Asphalt

- Length and width will be used when applicable
- Lane miles are based on 11' lane widths



MUIR WOODS NATIONAL MONUMENT

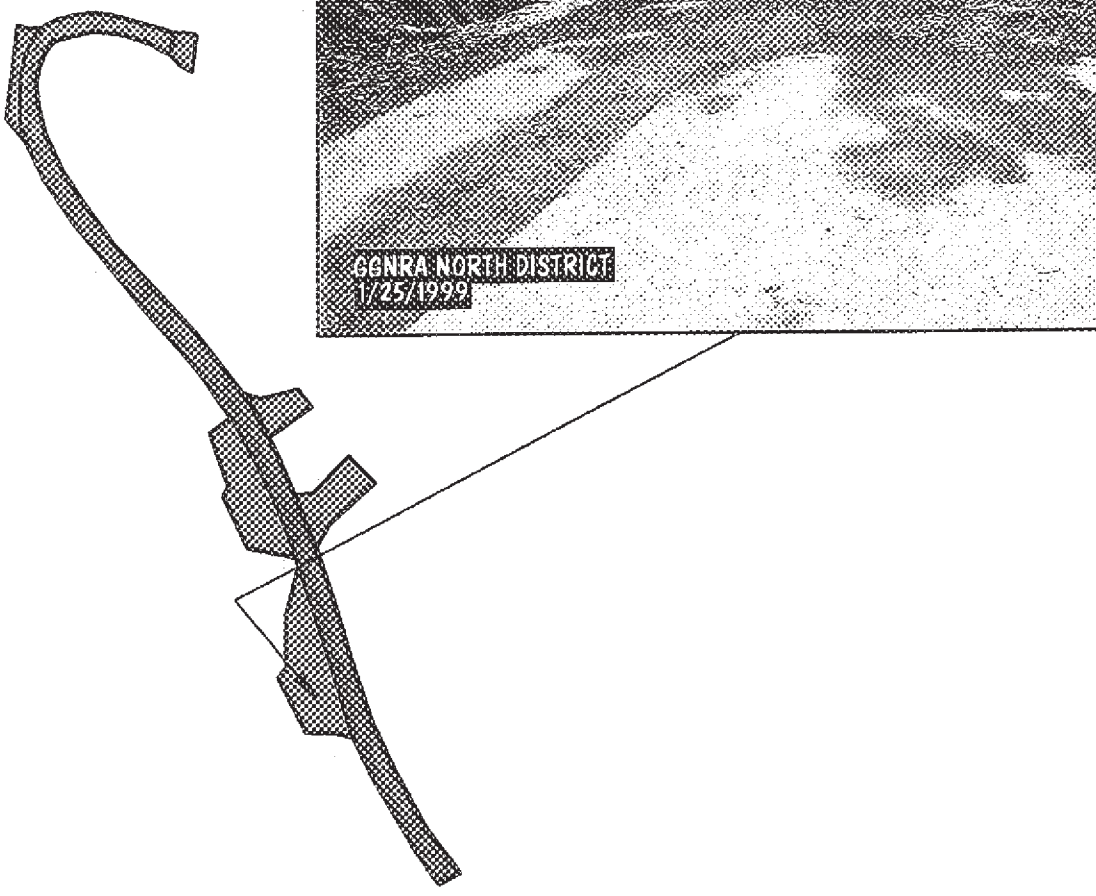
Route P903

ARAMARK-NPS ADMIN PARKING

RTE 203 ABOVE VISITOR CENTER PARKING (RTE 900)

Route	Date	Length (mi)	Width (ft)	Area (sq ft)	Lane Miles	Condition	Surface
903	990125	-	-	7,307	0.13	Good	Asphalt

- Length and width will be used when applicable
- Lane miles are based on 11' lane widths



250 0 250 Feet

MUIR WOODS NATIONAL MONUMENT

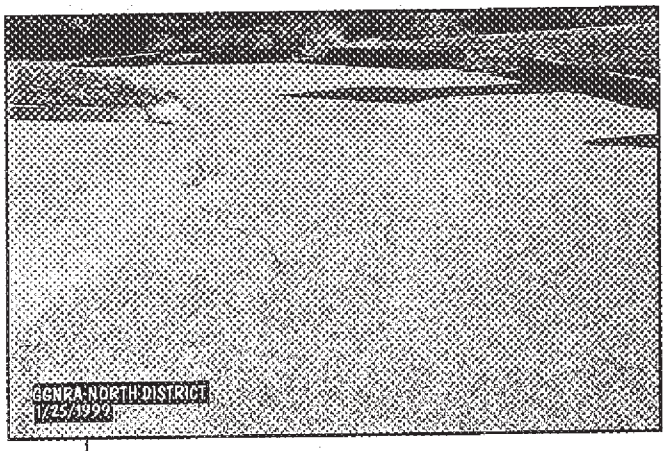
Route P922

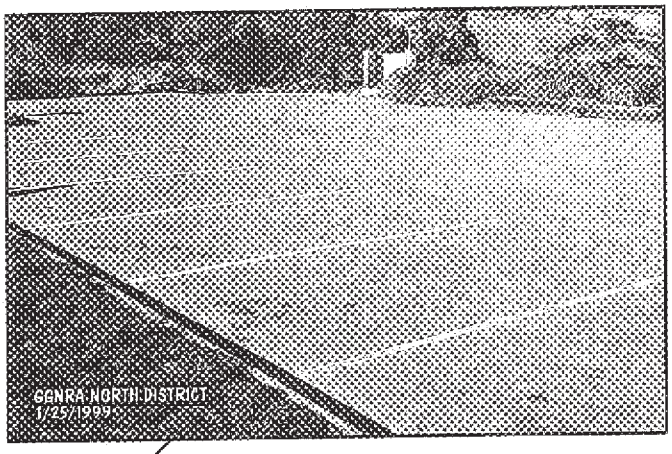
MUIR BEACH OVERLOOK PARKING

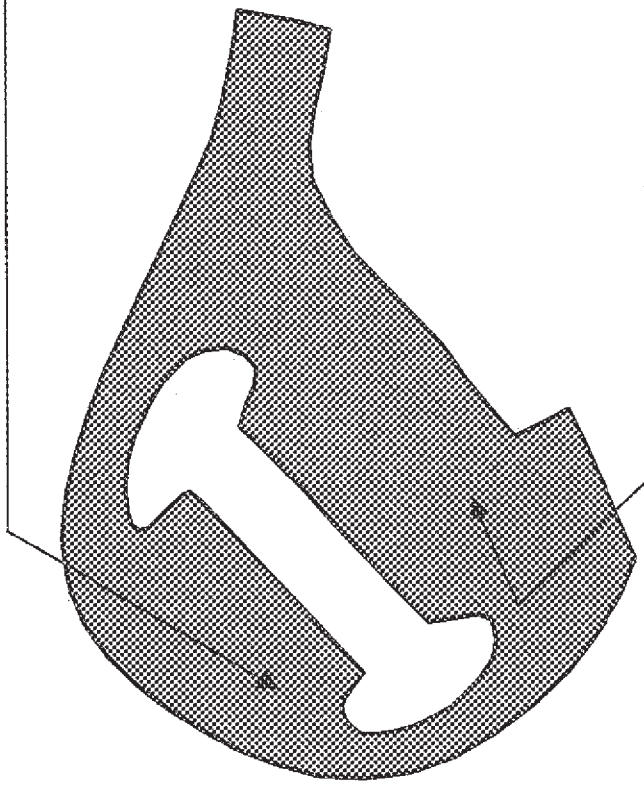
SHORELINE HIGHWAY 1 TO PARKING

Route	Date	Length (mi)	Width (ft)	Area (sq ft)	Lane Miles	Condition	Surface
922	990125	-	-	14,438	0.25	Excellent	Asphalt

- Length and width will be used when applicable
- Lane miles are based on 11' lane widths







50 0 50 100 Feet

PARKWIDE MAINTENANCE FEATURES SUMMARY
IMR : MUWO : 8180

ICAP CODE	FEATURE	PARK TOTAL	UNIT
1152	PULLOUT (PAVED)	1	EACH
1153	INTERSECTION	-	EACH
1190	TURNOUT (PASSING LANE)	-	LINEAR FEET
1320	PAVED DITCH	296	LINEAR FEET
1331	CULVERT	2	EACH
1333	DROP INLET	-	EACH
1340	CURB	407	LINEAR FEET
1530	TRAFFIC LIGHT	-	EACH
1540	GUARDRAIL	-	LINEAR FEET
1542	GUARDWALL	-	LINEAR FEET
1545	CATTLE GUARD	-	EACH
172-	BRIDGE	-	EACH
1740	TUNNEL	-	EACH
3361	RETAINING WALL	-	EACH
5833	LIGHT POLE	-	EACH
8390	OVERHEAD SIGN	-	EACH
8400	RAILROAD CROSSING	-	EACH
	GATE	1	EACH
	PAVED PARKING AREA	2	EACH
	PARK BOUNDARY	-	EACH

ROUTE MAINTENANCE FEATURES SUMMARY
IMR : MUWO : 8180

ROUTE 203 **MUIR WOODS ACCESS RD**

ICAP CODE	FEATURE	ROUTE TOTAL	UNIT
1152	PULLOUT (PAVED)	1	EACH
1153	INTERSECTION	-	EACH
1190	TURNOUT (PASSING LANE)	-	LINEAR FEET
1320	PAVED DITCH	296	LINEAR FEET
1331	CULVERT	2	EACH
1333	DROP INLET	-	EACH
1340	CURB	407	LINEAR FEET
1530	TRAFFIC LIGHT	-	EACH
1540	GUARDRAIL	-	LINEAR FEET
1542	GUARDWALL	-	LINEAR FEET
1545	CATTLE GUARD	-	EACH
172-	BRIDGE	-	EACH
1740	TUNNEL	-	EACH
3361	RETAINING WALL	-	EACH
5833	LIGHT POLE	-	EACH
8390	OVERHEAD SIGN	-	EACH
8400	RAILROAD CROSSING	-	EACH
	GATE	1	EACH
	PAVED PARKING AREA	2	EACH
	PARK BOUNDARY	-	EACH

ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 203 **MUIR WOODS ACCESS RD**

MILE POST BEGIN	MILE POST END	FEATURE DESCRIPTION LEFT	FEATURE DESCRIPTION RIGHT	REMARKS
0.003	0.058		CURB	
0.018			GATE	
0.034		PARKING AREA - PAVED		RTE 900, MUIR WOODS PARKING
0.048	0.056	CURB		
0.052			PULLOUT	
0.064			PARKING AREA - PAVED	RTE 900, MUIR WOODS PARKING
0.103	0.107	CURB		
0.106	0.116		CURB	
0.128			CULVERT	
0.147		PARKING AREA - PAVED		RTE 903, ARAMARK-NPS ADMIN PARKING
0.162			PARKING AREA - PAVED	RTE 903, ARAMARK-NPS ADMIN PARKING
0.172		PARKING AREA - PAVED		RTE 903, ARAMARK-NPS ADMIN PARKING
0.177			PARKING AREA - PAVED	RTE 903, ARAMARK-NPS ADMIN PARKING
0.190			CULVERT	
0.195	0.251		DITCH - PAVED	
0.251			END OF ROUTE	

PHOTOGRAPHIC SHEET

PARK: MUWO/8180
ROUTE: 203 - MUIR WOODS ACCESS ROAD
DATE: 990125

Photo # 01 Potholes at beginning of section 2.

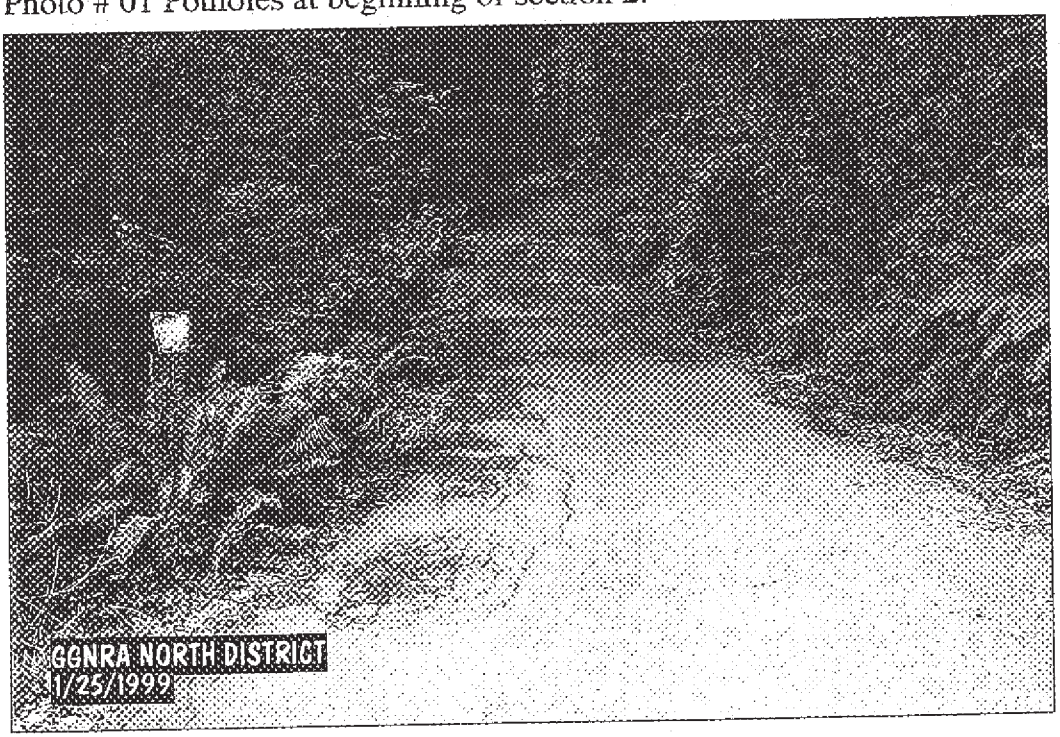


Photo # 02 Alligator cracking upper area section 2.

XI. UNPAVED ROUTES

Unpaved routes are not addressed in this report at this time. Section "IV. ROUTE INVENTORY" includes a current register of all unpaved routes (name, number, estimated mileage to the nearest 0.01, functional class, number of lanes, and termini description). Any further information will be added post 1997-99 data collection. Data was collected for unpaved routes in numerous parks during the '94-'96 data collection cycle. This data (digital images, GPS traces, features inventory, and condition assessments) may be processed in the future.

MUIR WOODS NATIONAL MONUMENT - MUWO - 8180
R.O.W. DIGITAL IMAGE INDEX

PAVED ROUTE NO.	MILEAGE AT BEGINNING PHOTO	FROM	TO	BEGINNING PHOTO NO.	ENDING PHOTO NO.	COMPACT DISC NO.	DATE	DIR: PRIM/ OPP
203	0.000	MUIR WOODS RD	END OF RD	559	612	MUWO_9903 _1	990125	P
203	0.251	END OF RD	MUIR WOODS RD	613	670	MUWO_9903 _1	990125	O

GLOSSARY OF TERMS AND ABBREVIATIONS

TERM OR ABBREVIATION	DESCRIPTION OR DEFINITION
8180	Muir woods National Monument numeric code
AADT	Annually adjusted average daily traffic. Average daily traffic for the term period comprising 80% of annual visitation.
CRS	Condition Rating Sheet. Index rating for pavement distresses, roadway condition and cross section information.
DCR	Drainage Condition Rating
DIRI	Driver International Roughness Index
Drainage Condition Rating	Rating from Poor (failed) to Excellent based on visual observations.
EXCELLENT	Excellent rating.
Func Class	Functional Class. See Table 1 in appendix.
FAIR	Fair rating.
MUWO	Muir Woods NRA alphabetic code
GOOD	Good rating.
IRI	International Roughness Index
Lane	The portion of roadway from centerline to fogline or edge of pavement if no fog line exists.
LRUT	Left Rut
NA	Not applicable or not available
Pavement Width	The entire portion of roadway from edge of pavement to edge of pavement.
PCR	Pavement condition rating. Numerical rating form 0 (failed) to 100 (excellent) based on the surface condition and the roughness of the road.
PIRI	Passenger International Roughness Index.
POOR	Poor rating.
RI	Roughness Index.
RTE #	Route number.
RRUT	Right Rut
SADT	Seasonal Annual Daily Traffic. Average daily traffic for the total "season".
SCR	Surface Condition Rating. Numerical rating from 0 (failed)to 100 (excellent).

TERM OR ABBREVIATION	DESCRIPTION OR DEFINITION
	Based on the extent of alligator cracking, patching, longitudinal cracking, rutting and transverse cracking.
Shoulder Condition Rating	Rating from Poor (failed) to Excellent. Based on visual and measured observations of the adequacy of a section of shoulder. Also applies to curb and gutter.
Shoulder Width	From fogline (if existing) or pavement edge to shoulder hinge point.
SF	Square Feet

GENERAL PARK ROAD FUNCTIONAL CLASSIFICATION - TABLE 1

Class I	Principal Park Road/Rural Parkway (Public Roads) - Roads which constitute the main access route, circulatory tour, or thoroughfare for park visitors. Route Numbers 1-99. Note: Rural parkways (e.g. Natchez Trace) are numbered 1-9. All other FC 1 routes have two digit numbers.
Class II	Connector Park Road (Public Roads) - Roads which provide access within a park to areas of scenic, scientific, recreational or cultural interest, such as overlooks, campgrounds, etc. Route Numbers 100-199.
Class III	Special Purpose Park Road (Public Roads) - Roads which provide circulation within public areas, such as campgrounds, picnic areas, visitor center complexes, concessionaire facilities, etc. These roads generally serve low-speed traffic and are often designed for one-way circulation. Route Numbers 200-299.
Class IV	Primitive Park Roads (Public Roads) - Roads which provide circulation through remote areas and/or access to primitive campgrounds and undeveloped areas. These roads frequently have no minimum design standards and their use may be limited to specially equipped vehicles. Route Numbers 200-299. Note: Functional Classes III and IV have the same route numbers because, historically, they were numbered similarly.
Class V	Administrative Access Road (Administrative Roads) - All public roads intended for access to administrative developments or structures such as park offices, employee quarters, or utility areas. Route Numbers 400-499.
Class VI	Restricted Road (Administrative Roads) - All roads normally closed to the public, including patrol roads, truck trails, and other similar roads. Route Numbers 400-499. Note: Functional Classes V and VI have the same route numbers because historically they were numbered similarly and often there is little distinction between these routes. For example, because utility areas and employee housing are often closed to the public, this restriction would result in classification of FC VI rather than FC V.
Class VII	Urban Parkway (Urban Parkways and City Streets) - These facilities serve high volumes of park and non-park related traffic and are restricted, limited-access facilities in an urban area. This category of roads primarily encompasses the major parkways which serve as gateways to our nation's capital. Other major park roads or portions thereof, however, may be included in this category. Route Numbers 1-9.
Class VIII	City Streets (Urban Parkways and City Streets) - City streets are usually extensions of the adjoining street system that are owned and maintained by the National Park Service. The construction and/or reconstruction should conform with accepted local engineering practice and local conditions. Route Numbers 600-699.

A park road system contains those roads within or giving access to a park or other unit of the NPS which are administered by the NPS, or by the Service in cooperation with other agencies. The assignment of a functional classification (FC) to a park road is not based on traffic volumes or design speed, but on the intended use or function of that road or route.

The historic route numbering system also included a 300 number series for interpretive roads, and a 500 series for one-way roads. There are approximately 250 roads nationwide which are designated by the 300 and 500 series. The numbers for these roads will be maintained for reporting consistency. However, since these interpretive and one-way routes are not as clearly tied to a specific functional class, the 300 and 500 series will be discontinuted for future use.

DESCRIPTION OF RATING SYSTEM

Data is collected on the following distresses and conditions:

- **Alligator Cracking** - a series of interconnecting cracks resembling alligator skin or chicken wire.
- **Longitudinal Cracking** - cracks which are parallel to the pavement centerline or asphalt lay down direction.
- **Transverse Cracking** - cracks perpendicular to the pavement centerline.
- **Pothole (patch)** - a bowl-shaped hole in the pavement surface.
- **Rutting** - surface depressions in the wheel paths.

In addition, **Roughness** has been collected and is used in the PCR formula.

A Rating Index value is calculated for each of these at the 0.02 mile, or every 105.6 feet.

Rating Index Formulas

Alligator Cracking Index = 100 - [40 * (%low/70 + %medium/30 + %high/10)]
Longitudinal Cracking Index = 100 - [40 * (%low/350 + %medium/200 + %high/75)]
Transverse Cracking Index = 100 - [40 * (low/28.69 + medium/14.25 + high/3.6)]
Patching Index = 100 - [40 * (%patching / 80)]
Rutting Index: Asphalt Surface = [13.33 * (deepest rut)^2] - [86.67 * deepest rut] + 100
Chipseal (1-5 yrs. old) = [9.53 * (deepest rut)^2] - [86.67 * deepest rut] + 108.57
Chipseal (>5 yrs. old) = [3.85 * (deepest rut)^2] - [83.46 * deepest rut] + 116.53
Roughness Index (RI) = $29*[5*e^{(-0.0041*\text{average IRI})}]$

These 0.02 Rating Index values are then averaged over one mile sections for the mile-by-mile Rating Indexes, Surface Condition Rating (SCR) and Pavement Condition Rating (PCR).

Surface Condition Rating (SCR) = 100 - [40 * (LOW ALLIGATOR CRACKING/70 + MEDIUM ALLIGATOR CRACKING/30 + HIGH ALLIGATOR CRACKING/10 + PATCHING/80 + LOW TRANSVERSE CRACKING/28.69 + MEDIUM TRANSVERSE CRACKING/14.25 + HIGH TRANSVERSE CRACKING/3.6 + LOW LONGITUDINAL CRACKING/350 + MEDIUM LONGITUDINAL CRACKING/200 + HIGH LONGITUDINAL CRACKING/75 + MAXIMUM RUT VALUE)]

Pavement Condition Rating (PCR) = (SCR * 0.60) + (RI * 0.40)
NOTE: Collection of roughness data is dependant on the data collection vehicle traveling at a minimum speed of 22 mph. In the event that a route cannot be safely traveled at this minimum speed, and results in no roughness data, the SCR only will be calculated.

Drainage Condition Rating Definitions

Excellent: No drainability problem. If funding were available for pavement maintenance, no funds would be required for drainage concerns.

Good: Minimal overall drainability problems. If funding were available for pavement maintenance, 25% or less is estimated to correct drainage deficiencies.

Fair: Moderate problems with drainability that needs correcting before it deteriorates to a poor rating. If funding were available for pavement maintenance in this section, 25% to 50% is estimated to correct deficiencies.

Poor: Severe problems exist that jeopardizes the integrity of the road in this section. If funding were available for pavement maintenance, 50% to 100% is estimated to correct drainage deficiencies.

Drainage Rating Criteria

The following are examples of basic criteria to help the rater to identify the different drainability ratings. While in the field, many other flaws will be discovered, but this criteria should give a feel for where the flaws would apply in the ratings.

A. Excellent Drainability

All water clears the road prism adequately without any chance of base saturation.

- Pavement drains without interruption.
- Curbs are flawless with the exception of minor cracking.
- Down drains are secure and placed properly.
- Drop inlets are at the correct grade and location with no deficiencies.
- Culverts are adequate in numbers, size, and condition.
- Ditches may be constructed of asphalt and are sufficient to carry required volumes of water.

B. Good Drainability

Most water clears the road prism adequately with little concern of base saturation.

- Pavement has minor deficiencies that interrupt water flow.
- Shoulders are mostly adequate as they relate to surrounding terrain. Shoulder design generally coincides with the drainage design.
- Curbs have deficiencies, but still function without erosion.
- Down drains are placed properly, but show signs of some deterioration.
- Culverts are adequate in numbers and size, however, minor deficiencies are evident.
- Ditches may not be paved, but are solid and have enough area to maintain and carry required volume of water.

C. Fair Drainability

Some areas have questionable ability for the water to clear the road prism with an uncomfortable concern for base saturation.

- Pavement shows moderate flaws, such as rutting, and other irregularities that would hold minor amounts of water, interrupting the flow of water.
- Shoulder grades restrict the flow of water, however, water exits after some ponding.
- Down drains show evidence that limited water is causing erosion as a result of deterioration, or other similar flaws (e.g. missing asphalt that guides water to down drain).
- Drop inlet encasements are cracked, iron is bent, or are misaligned to cause limited water to escape,
- Culvert headwalls show moderate damage or are inadequate, the exit shows some damage to fill areas, or entry asphalt is moderately damaged.
- Ditches have some permeable material, unmovable obstructions to interrupt flow obviously hard to maintain due to inconsistencies, or have a less than desirable area to carry required volumes of water.

D. Poor Drainability

This section has areas of inadequate drainage ability that is causing base saturation that could cause a road failure.

- Pavement grade is irregular and holds dangerous amounts of water (hydroplaning is a concern), or shows massive alligator cracking.
- Shoulder design induces ponding that encroaches on the pavement (drivers try to avoid ponds).
- Portions of curbs are missing, allowing water to escape causing erosion.
- Drop inlets, due to various reasons, are only able to drain 50% or less efficiently.
- Down drains show signs of water exiting in areas by the down drain causing erosion.
- Culverts are functionally deficient including size, installation, location, or grade giving water opportunity to saturate the road base.
- Ditches allow water opportunity to saturate the road base through various reasons such as low places in ditch where design has not allowed for water to drain, little or no room in the road prism for a needed ditch, or water is disappearing within the ditch.

<u>Shoulder Condition Rating Definitions</u>

Excellent: Shoulder is new or under construction. It meets or exceeds standards. The curb is new.

Good: The shoulder is below standard width for posted speed and grading is required. The curb is functional.

Fair: There are variations in the shoulder, irregular width with material replacement required . The curb is in need of repairs or adjustments.

Poor: There isn't any shoulder, erosion has removed it. The curb needs replacement.

Shoulder Rating Criteria

The following are examples of basic criteria to help the rater to identify the different shoulder ratings. While in the field, many other flaws will be discovered, but this criteria should give a feel for where the flaws would apply in the ratings.

The overall shoulder condition rating for a section is determined by the lowest individual rating for any one of the above categories (width, rutting, cracking, erosion, drop-off, and curbs).

A. Excellent Shoulders

- If shoulder is unpaved there will not be any drop-offs or erosion.
- If shoulder is paved there isn't any rutting, cracking, or erosion.
- Curbs are flawless with the exception of minor cracking and no erosion behind curb.

B. Good Shoulders

- If shoulder is unpaved drop-offs are less than 1", but grading is required.
- If shoulder is paved rut depth is less than 1/2", sealed cracks are present, and grading is required.
- If curbs are present they are functional.

C. Fair Shoulder

- If shoulder is unpaved drop-offs are from 1" to 4" and replacement of material required.
- If shoulder is paved rut depth is from 1/2" to 1". Open cracks are present but less than 1/4" deep, replacement of material is needed from erosion.
- If curbs are present they need repairs, and there is erosion behind the curb.

D. Poor Shoulder

- If shoulder is unpaved drop-offs are greater than 4" and erosion has removed the shoulder.
- If shoulder is paved rut depth is greater than 1". Open cracks are greater than 1/4" deep, and erosion has removed the shoulder.
- If curbs are present they need replacement.