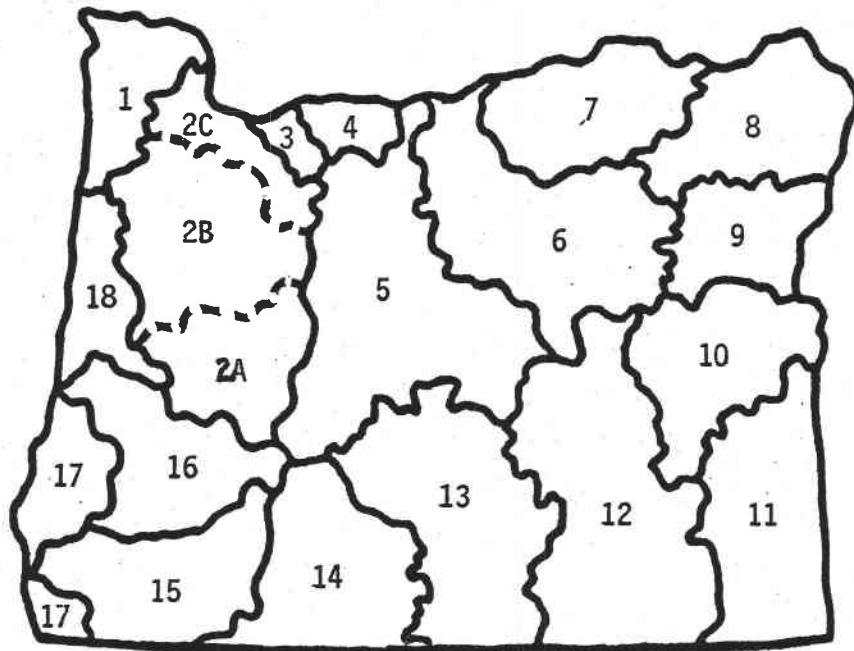


A RESOURCE SURVEY OF RIVER ENERGY
AND LOW-HEAD HYDROELECTRIC POWER POTENTIAL
IN OREGON

APPENDIX 16: UMPQUA BASIN



WATER RESOURCES RESEARCH INSTITUTE
Oregon State University
Corvallis, Oregon 97331

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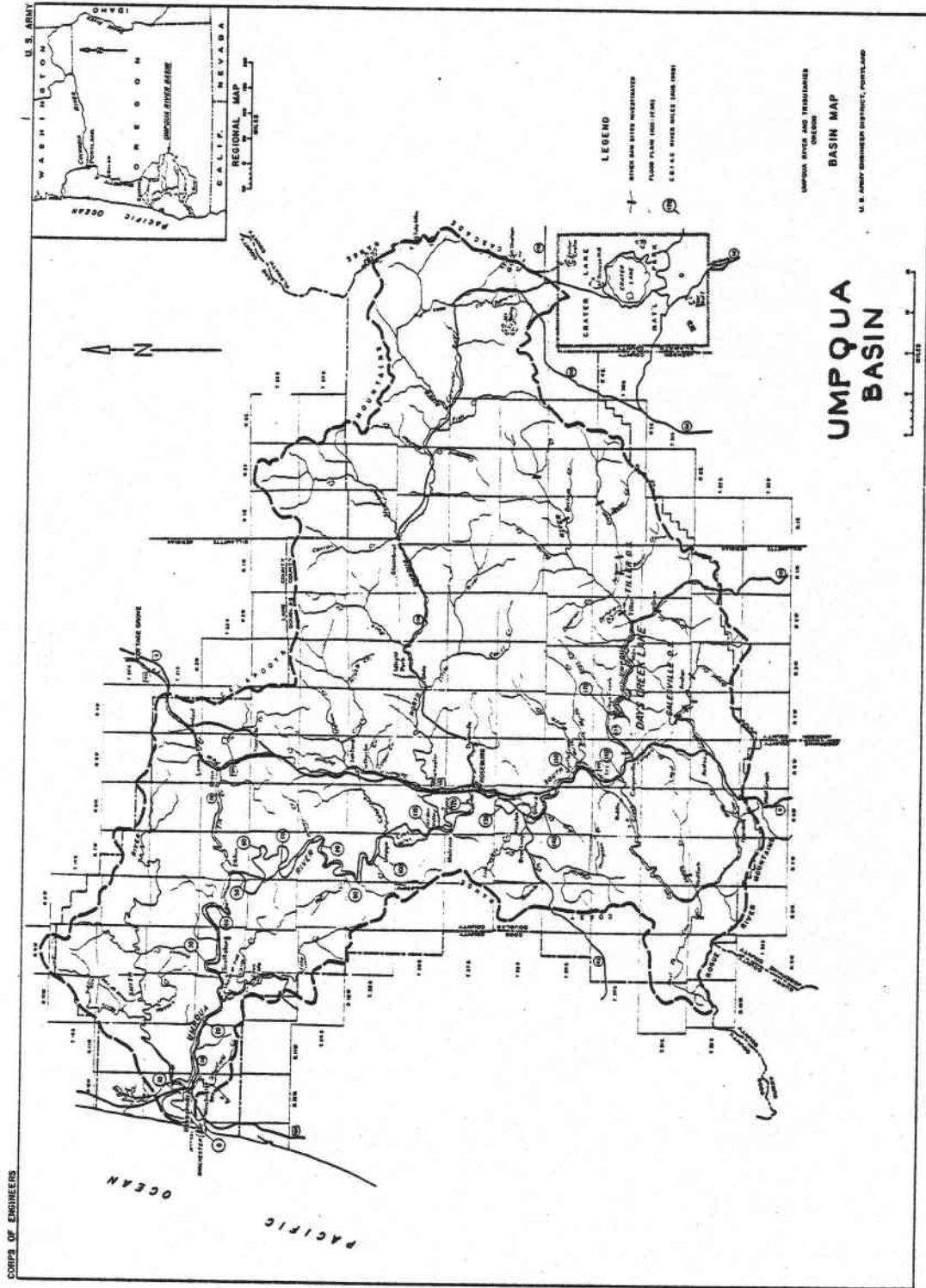
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REACH HYDRO POTENTIAL CHARACTERISTICS

REACH # 02-700-000-000-R0001

I. LOCATION

A. State	Oregon
B. County	Douglas
C. Township, Range	Sec. 29, T21S, R12W
D. Latitude, Longitude	43°43'N, 124°10'W
E. Stream Name	Umpqua River
F. Major Basin Name	Umpqua
G. River Mile	0.0 to 11.5

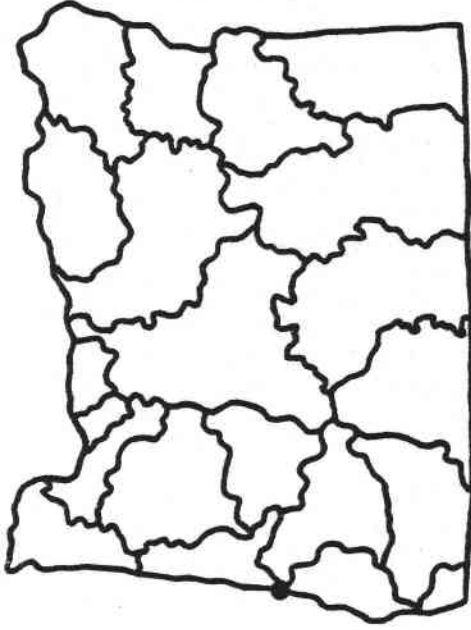
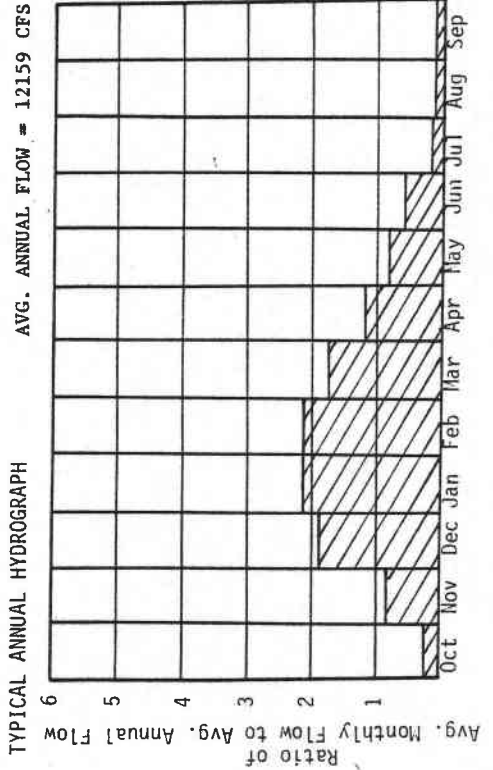
II. HYDROLOGIC AND HYDRAULIC CHARACTERISTICS

A. Upstream Elevation of Reach	1	Ft. MSL
B. Downstream Elevation of Reach	0	Ft. MSL
C. Total Available Head in Reach	1	Ft.
D. Average Slope in Reach	0.1	Ft./Mi.
E. Drainage Area above Reach Mouth	4615.6	Sq. Mi.
F. Inflow Classification	Regulated	

III. REACH FLOW DURATION AND THEORETICAL POTENTIAL ENERGY CHARACTERISTICS

I EXCEEDANCE I	DISCHARGE I	THEORETICAL I	ANNUAL ENERGY I	PLANT I
I PERCENTAGE I	CFS I	PLANT SIZE I	AVAILABLE I	FACTOR I
I	I	MW I	GWH I	I
I 95 I	I 2582.3 I	I .22 I	I 1.92 I	I 1.000 I
I 80 I	I 3508.5 I	I .30 I	I 2.52 I	I .967 I
I 50 I	I 7736.7 I	I .66 I	I 4.56 I	I .794 I
I 30 I	I 12704.1 I	I 1.08 I	I 6.03 I	I .640 I
I 10 I	I 24382.1 I	I 2.07 I	I 7.77 I	I .429 I

IV. TYPICAL ANNUAL HYDROGRAPH



U.S.G.S. TOPO. SERIES
1:250,000 SCALE
MAP NAME: COOS BAY



REACH HYDRO POTENTIAL CHARACTERISTICS

REACH # 02-700-002-000-000-R0001

I. LOCATION

A. State	Oregon
B. County	Douglas
C. Township, Range	Sec. 19, T21S, R11W
D. Latitude, Longitude	43°44'N, 124°03'W
E. Stream Name	Smith River
F. Major Basin Name	Umpqua
G. River Mile	0.0 to 7.0

II. HYDROLOGIC AND HYDRAULIC CHARACTERISTICS

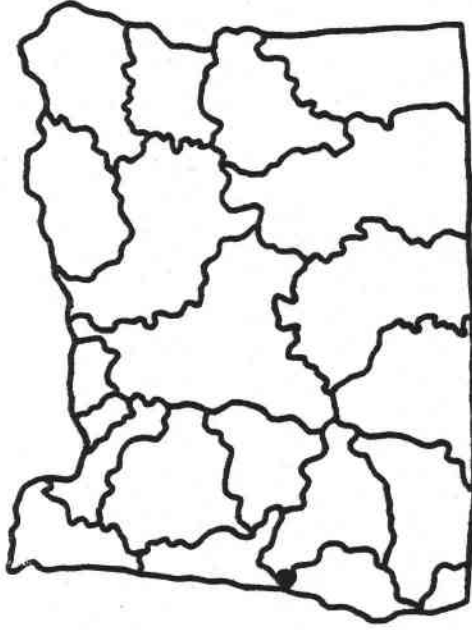
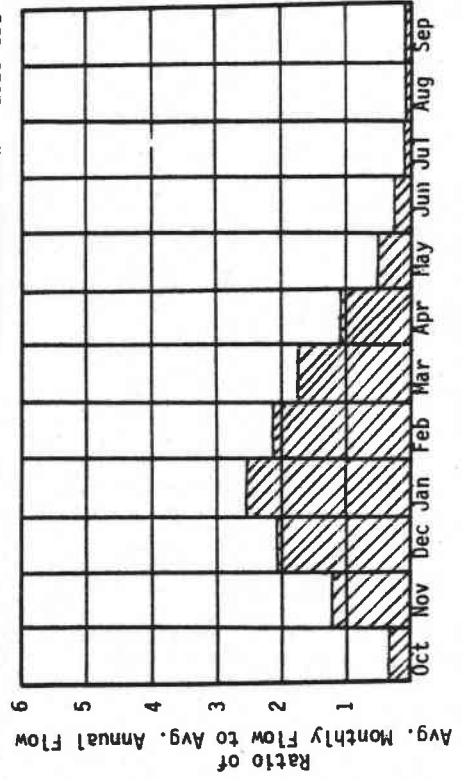
A. Upstream Elevation of Reach	2	Ft. MSL
B. Downstream Elevation of Reach	1	Ft. MSL
C. Total Available Head in Reach	1	Ft.
D. Average Slope in Reach	0.1	Ft./Mi.
E. Drainage Area above Reach Mouth	372.7	Sq. Mi.
F. Inflow Classification	Natural	

III. REACH FLOW DURATION AND THEORETICAL POTENTIAL ENERGY CHARACTERISTICS

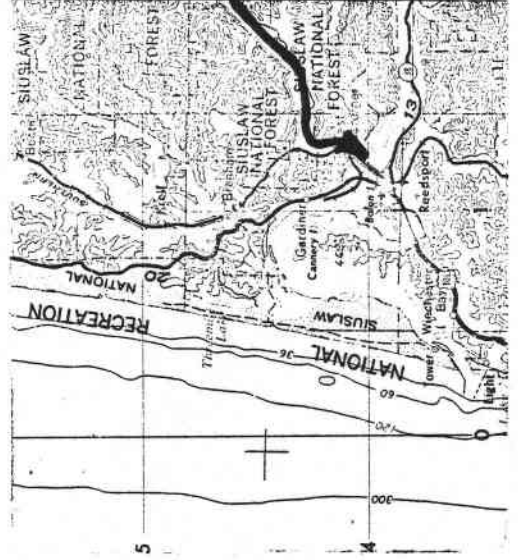
I EXCEEDANCE I PERCENTAGE I	I DISCHARGE I CFS	I THEORETICAL I PLANT SIZE I MW	I ANNUAL ENERGY I AVAILABLE I GWH	I PLANT I FACTOR I
I 95	I 82.4	I .01	I .06	I 1.000
I 80	I 144.4	I .01	I .10	I .946
I 50	I 565.6	I .05	I .30	I .726
I 30	I 1215.4	I .10	I .50	I .552
I 10	I 2704.1	I .23	I .72	I .358

IV. TYPICAL ANNUAL HYDROGRAPH

AVG. ANNUAL FLOW = 1318 CFS



U.S.G.S. TOPO. SERIES
1:250,000 SCALE
MAP NAME: COOS BAY-ROSEBURG



REACH HYDRO POTENTIAL CHARACTERISTICS

REACH # 02-700-002-000-000-R0002

I. LOCATION

A. State	Oregon
B. County	Douglas
C. Township, Range	Sec. 2, T21S, R11W
D. Latitude, Longitude	43°46' N, 123°59' W
E. Stream Name	Smith River
F. Major Basin Name	Umpqua
G. River Mile	7.0 to 16.0

II. HYDROLOGIC AND HYDRAULIC CHARACTERISTICS

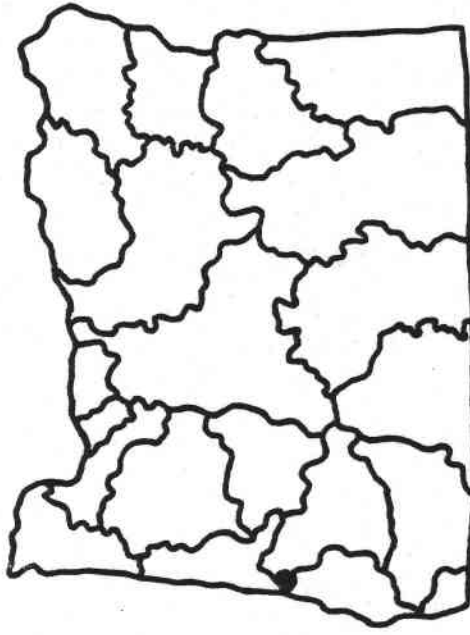
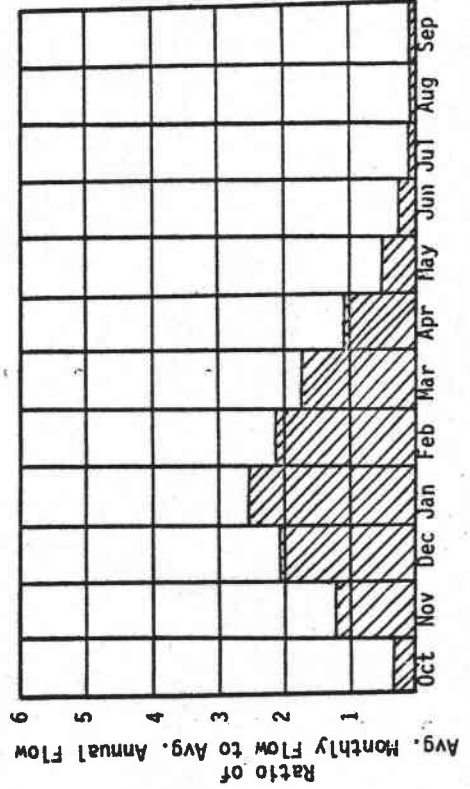
A. Upstream Elevation of Reach	9	Ft. MSL
B. Downstream Elevation of Reach	2	Ft. MSL
C. Total Available Head in Reach	7	Ft.
D. Average Slope in Reach	0.8	Ft./Mi.
E. Drainage Area above Reach Mouth	342.5	Sq. Mi.
F. Inflow Classification	Natural	

III. REACH FLOW DURATION AND THEORETICAL POTENTIAL

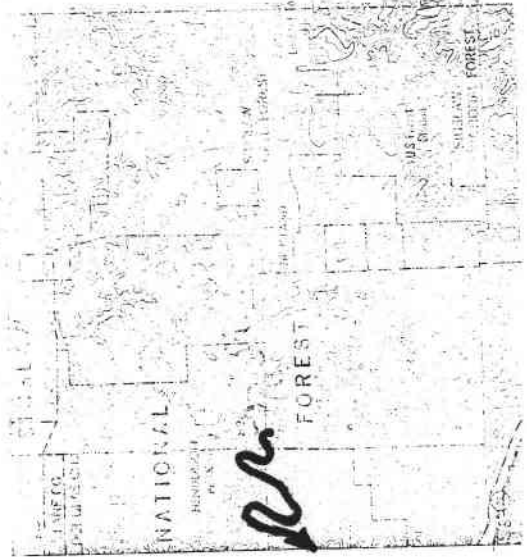
ENERGY CHARACTERISTICS		THEORETICAL		ANNUAL ENERGY		PLANT	
I EXCEEDANCE I PERCENTAGE I	I DISCHARGE I CFS I	I PLANT SIZE I MW I	I AVAILABLE I GWH I	I FACTOR I	I PLANT I	I FACTOR I	I PLANT I
I 95 I	I 73.0 I	I .04 I	I .38 I	I 1.000 I	I	I	I
I 80 I	I 129.2 I	I .08 I	I .63 I	I .946 I	I	I	I
I 50 I	I 516.2 I	I .31 I	I 1.94 I	I .724 I	I	I	I
I 30 I	I 1119.6 I	I .66 I	I 3.20 I	I .549 I	I	I	I
I 10 I	I 2504.0 I	I 1.49 I	I 4.64 I	I .356 I	I	I	I

IV. TYPICAL ANNUAL HYDROGRAPH

AVG. ANNUAL FLOW = 1219 CFS



U.S.G.S. TOPO. SERIES
1:250,000 SCALE
MAP NAME: ROSEBURG



REACH HYDRO POTENTIAL CHARACTERISTICS

REACH # 02-700-002-000-R0001

I. LOCATION

A. State	Oregon
B. County	Douglas
C. Township, Range	Sec. 5, T20S, R10W
D. Latitude, Longitude	43° 52' N, 124° 55' W
E. Stream Name	North Fork Smith River
F. Major Basin Name	Umpqua
G. River Mile	0.0 to 16.0

II. HYDROLOGIC AND HYDRAULIC CHARACTERISTICS

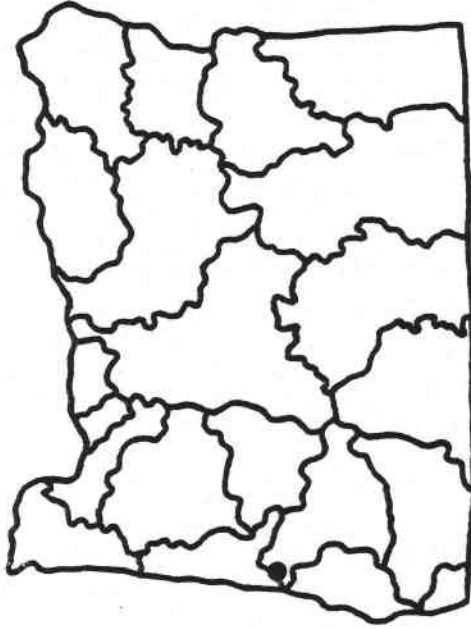
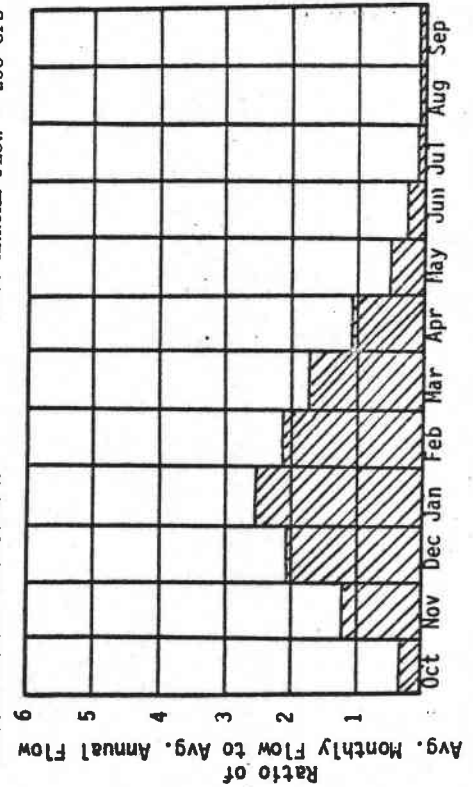
A. Upstream Elevation of Reach	275	Ft. MSL
B. Downstream Elevation of Reach	9	Ft. MSL
C. Total Available Head in Reach	266	Ft.
D. Average Slope in Reach	16.6	Ft./Mi.
E. Drainage Area above Reach Mouth	66.9	Sq. Mi.
F. Inflow Classification	Natural	

III. REACH FLOW DURATION AND THEORETICAL POTENTIAL ENERGY CHARACTERISTICS

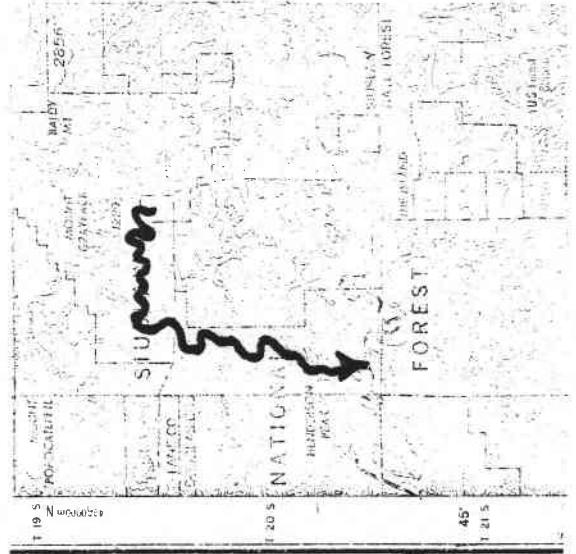
I EXCEEDANCE I PERCENTAGE I	I DISCHARGE I CFS I	I THEORETICAL I PLANT SIZE I MW I	I ANNUAL ENERGY I AVAILABLE I GWH I	I PLANT I FACTOR I
I 95 I	I 4.5 I	I .10 I	I .88 I	I 1.000 I
I 80 I	I 9.7 I	I .22 I	I 1.78 I	I .932 I
I 50 I	I 61.7 I	I 1.39 I	I 8.46 I	I .694 I
I 30 I	I 166.5 I	I 3.75 I	I 16.74 I	I .509 I
I 10 I	I 419.9 I	I 9.47 I	I 26.75 I	I .323 I

IV. TYPICAL ANNUAL HYDROGRAPH

AVG. ANNUAL FLOW = 200 CFS



U.S.G.S. TOPO. SERIES
1:250,000 SCALE
MAP NAME: ROSEBURG



REACH HYDRO POTENTIAL CHARACTERISTICS

REACH # 02-700-002-002-000-R0002

I. LOCATION

A. State	Oregon
B. County	Douglas
C. Township, Range	T19S, R9W
D. Latitude, Longitude	43° 55' N, 123° 50' W
E. Stream Name	North Fork Smith River
F. Major Basin Name	Jimpqua
G. River Mile	16.0 to H.W.

II. HYDROLOGIC AND HYDRAULIC CHARACTERISTICS

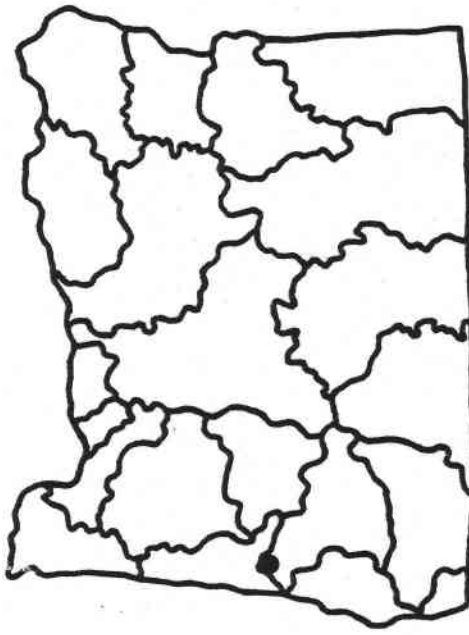
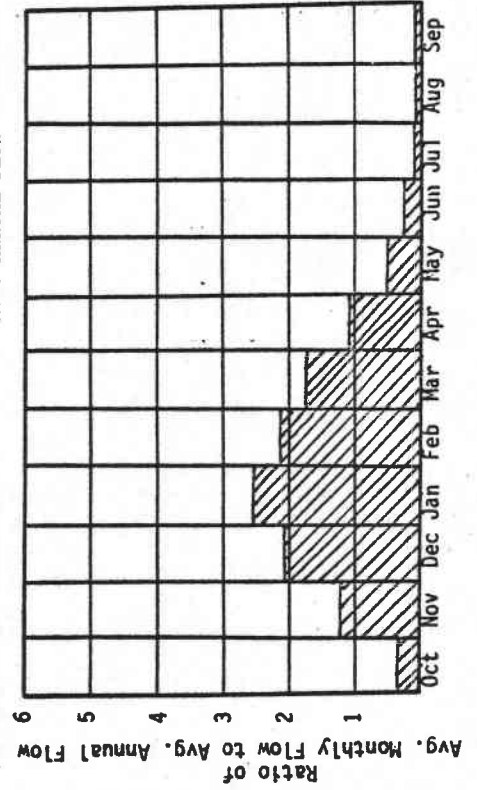
A. Upstream Elevation of Reach	---	Ft. MSL
B. Downstream Elevation of Reach	---	Ft. MSL
C. Total Available Head in Reach	66	Ft.
D. Average Slope in Reach	---	Ft./MI.
E. Drainage Area above Reach Mouth	33.0	Sq. MI.
F. Inflow Classification	Natural	

III. REACH FLOW DURATION AND THEORETICAL POTENTIAL ENERGY CHARACTERISTICS

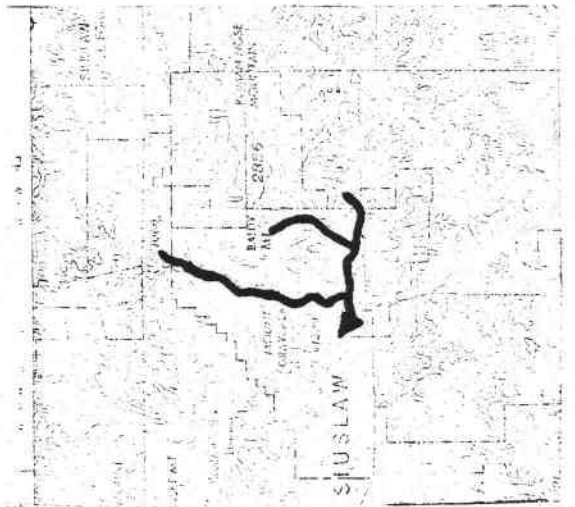
I EXCEEDANCE I PERCENTAGE I I	I DISCHARGE I I	I THEORETICAL I PLANT SIZE I MW	I ANNUAL ENERGY I AVAILABLE I GWH	I PLANT I FACTOR I
I 95 I	I 2.3 I	I .01 I	I .11 I	I 1.000 I
I 80 I	I 5.3 I	I .03 I	I .24 I	I .930 I
I 50 I	I 37.4 I	I .21 I	I 1.26 I	I .689 I
I 30 I	I 106.3 I	I .59 I	I 2.61 I	I .502 I
I 10 I	I 275.8 I	I 1.54 I	I 4.28 I	I .316 I

IV. TYPICAL ANNUAL HYDROGRAPH

AVG. ANNUAL FLOW = 131 CFS



U.S.G.S. TOPO. SERIES
1:250,000 SCALE
MAP NAME: ROSEBURG



REACH HYDRO POTENTIAL CHARACTERISTICS

REACH # 02-700-002-000-000-R0003

I. LOCATION

A. State	Oregon
B. County	Douglas
C. Township, Range	Sec. 5, T21S, R10W
D. Latitude, Longitude	43°47' N, 123°55' W
E. Stream Name	Smith River
F. Major Basin Name	Umpqua
G. River Mile	16.0 to 20.3

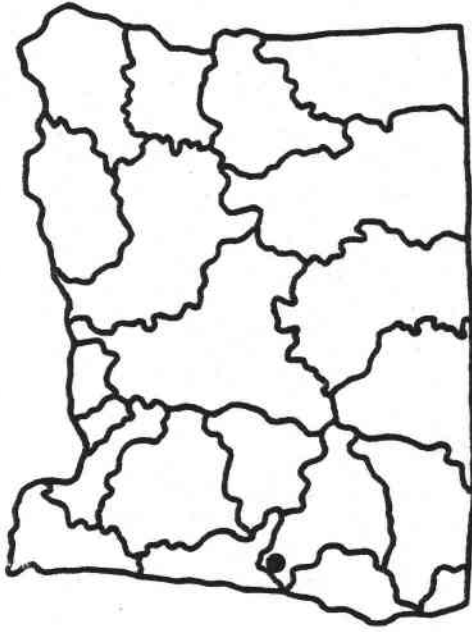
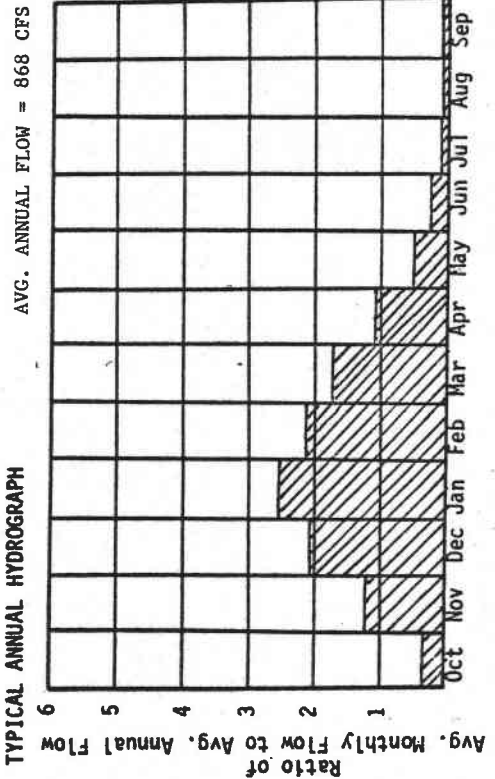
II. HYDROLOGIC AND HYDRAULIC CHARACTERISTICS

A. Upstream Elevation of Reach	16	Ft. MSL
B. Downstream Elevation of Reach	9	Ft. MSL
C. Total Available Head in Reach	5	Ft.
D. Average Slope in Reach	1.2	Ft./Mi.
E. Drainage Area above Reach Mouth	257	Sq. Mi.
F. Inflow Classification	Natural	

III. REACH FLOW DURATION AND THEORETICAL POTENTIAL ENERGY CHARACTERISTICS

I EXCEEDANCE I PERCENTAGE I	I DISCHARGE I	I THEORETICAL I	I ANNUAL ENERGY I	I PLANT I
I	I CFS	I PLANT SIZE I	I AVAILABLE I	I FACTOR I
I	I	I MW	I GWH	I
I 95	I 43.1	I .02	I .16	I 1.000
I 80	I 79.3	I .03	I .28	I .943
I 50	I 346.2	I .15	I .92	I .717
I 30	I 782.3	I .33	I 1.57	I .540
I 10	I 1789.5	I .76	I 2.32	I .349

IV. TYPICAL ANNUAL HYDROGRAPH



U.S.G.S. TOPO. SERIES
1:250,000 SCALE
MAP NAME: ROSEBURG

