CATALOG DOCUMENTATION
REGIONAL ENVIRONMENTAL MONITORING AND ASSESSMENT PROGRAM - REGION 10
1994-1995 WASHINGTON/OREGON COASTAL STREAMS AND YAKIMA RIVER BASIN STREAMS
FISH AND AMPHIBIAN ASSEMBLAGE METRICS DATA

TABLE OF CONTENTS

1. DATA SET IDENTIFICATION

1.1 Title of Catalog Document

Regional Environmental Monitoring and Assessment Program - Region 10
1994-1995 Washington/Oregon Coastal Streams and Yakima Basin Streams
Fish and Amphibian Assemblage Metrics Data Set

1.2 Authors of the Catalog Entry

U.S. EPA NHEERL Western Ecology Division
Corvallis, OR

1.3 Catalog Revision Date

23 March 1999

1.4 Data Set Name

FSHMET

1.5 Task Group

Region 10

1.6 Data Set Identification Code

00008

1.7 Version

001

1.8 Requested Acknowledgment

These data were produced as part of the U.S. EPA's Environmental Monitoring and Assessment Program (EMAP). If you publish these data or use them for analyses in publication, EPA requires a standard statement for work it has supported:

"Although the data described in this article have been funded wholly or in part by the U. S. Environmental Protection Agency through its Regional EMAP program, it has not been subjected to Agency review, and therefore does not necessarily reflect the views of the Agency and no official endorsement should be inferred."

2. INVESTIGATOR INFORMATION

2.1 Principal Investigators

Gretchen Hayslip
U.S. EPA Region 10

Glenn Merritt
Washington State Department of Ecology

Rick Hafele
Oregon Department of Environmental Quality

2.2 Investigation Participant - Sample Collection

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Office of Research and Development
Region 10
Oregon Department of Environmental Quality
Washington State Department of Ecology
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University of Washington
Yakama Indian Nation Environmental Protection Program

3. DATA SET ABSTRACT

3.1 Abstract of the Data Set

The FSHMET data set contains metrics calculated from data collected during multi-habitat sampling of the fish and amphibian assemblages in each stream reach. This data set contains a list of metrics derived from the species composition within the stream at the time of sampling. The metrics summarize the species relative abundance information by collapsing it into a series of

metrics representing trophic guilds, habitat preferences, tolerance capacities and measures of biodiversity.

3.2 Keywords for the Data Set

fish assemblage, fish community, fish species identification, amphibian assemblage, amphibian community, amphibian species identification

4. OBJECTIVES AND INTRODUCTION

4.1 Program and Project Objectives

4.1.1 Program Objective

The Regional Environmental Assessment and Monitoring Program (R-EMAP) was initiated to test the applicability of the EMAP approach to answer questions about ecological conditions at regional and local scales. Using EMAP's statistical design and indicator concepts, R-EMAP conducts projects at smaller geographic scales and in shorter time frames.

4.1.2 Project Objective

The objectives of Region 10 1994-1995 Washington/Oregon Coastal Streams and Yakima Basin Streams R-EMAP project were to:

1. Determine the ecological condition of wadeable, 1st-order through 3rd-order streams of the Coast Range Ecoregion and the Yakima River Basin (Columbia Basin Ecoregion).
2. Determine the relationship between the ecological condition of these streams and the predominant land used of the watersheds.
3. Provide the states of Washington and Oregon with information that would assist in the development of water quality biological criteria using indices based on fish/amphibian and invertebrate taxa assemblage information.
4. Determine the applicability of EMAP-derived methods for assessments of ecological condition within streams in the states of Washington and Oregon.

4.2 Data Set Objective

The primary function of the stream fish and amphibian data are to provide a snapshot of the fish and amphibian assemblages present in the stream at the time of sampling.

4.3 Data Set Background Discussion

The fish and amphibian assemblages within a stream represent a critical component of stream biological integrity. The fish community also represents a publicly visible reflection of stream quality.

4.4 Summary of Data Set Parameters

Fish and amphibian assemblage metrics include counts of individuals and species collected which can be grouped into several functional classifications, as well as percent of species collected in the same classifications. The classifications include feeding functions such as insectivores and piscivores, species similarities such as minnow species, native/non-native classification, and pollution tolerance or intolerance.

5. DATA ACQUISITION AND PROCESSING METHODS

5.1 Data Acquisition

5.1.1 Sampling Objective

To obtain a sample of the fish and amphibian assemblages within a stream during the specified sampling window.

5.1.2 Sample Collection Methods Summary

The assemblages were sampled using a single pass electrofishing distributed in multiple habitats throughout the stream.

5.1.3 Sampling Start Date

May 1994
May 1995

5.1.4 Sampling End Date

Oct 1994
Sept 1995

5.1.5 Platform

NA

5.1.6 Sampling Equipment

NA

5.1.7 Manufacturer of Sampling Equipment

backpack electrofishing unit, dip nets, seines, bucket, "bump board" for measuring lengths, formaldehyde

5.1.8 Key Variables

NA

5.1.9 Sampling Method Calibration

NA

5.1.10 Sample Collection Quality Control

Chaloud, D.J. and D.V. Peck. 1994. Environmental Monitoring and Assessment Program - Surface Waters: Integrated Quality Assurance Project Plan for the Surface Waters Resource Group, 1994 Activities. EPA 600/X-91/080, Rev. 2.00. U.S. Environmental Protection Agency, Office of Research and Development, Las Vegas, NV 89193.

Hayslip, G. A. (editor). 1993. EPA Region 10 In-stream Biological Monitoring Handbook (for wadeable streams in the Pacific Northwest). EPA-910/9-92-013. U. S. Environmental Protection Agency - Region 10, Environmental Services Division, Seattle, WA 98101.

Merritt, G.D. 1994. Biological Assessment of wadeable Streams in the Coast Range Ecoregion and the Yakima River Basin: Final Quality Assurance Project Plan. Washington State Department of Ecology, Environmental Investigations and Laboratory Services, Olympia, WA, 15 pp.

5.1.11 Sample Collection Method Reference

Hayslip, G. A. (editor). 1993. EPA Region 10 In-stream Biological Monitoring Handbook (for wadeable streams in the Pacific Northwest). EPA-910/9-92-013. U. S. Environmental Protection Agency - Region 10, Environmental Services Division, Seattle, WA 98101.

Hayslip, G., D.J. Klemm, J.M. Lazorchak. 1994. Environmental Monitoring and Assessment Program Surface Waters and Region 10 Regional Environmental Monitoring and Assessment Program: 1994 Pilot Field Operations and Methods Manual for Streams on the Coast Range Ecoregion of Oregon and Washington and the Yakima River Basin. Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, OH.

Lazorchak, J.M., D.J. Klemm, and D.V. Peck. (editors). 1998. Environmental Monitoring and Assessment Program - Surface Waters: Field Operations and Methods for Measuring the Ecological Condition of Wadeable Streams. EPA/620/R-94/004F. U.S. Environmental Protection Agency, Washington, D.C.

Plafkin, J.L., M.T. Barbour, K.D. Porter, S.K. Gross, and R.M Hughes. 1989. Rapid Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish. EPA 440/4-89/001. U.S. Environmental Protection Agency, Office of Water, Washington, D.C.

5.1.12 Sample Collection Method Deviations

NA

5.2 Data Preparation and Sample Processing

5.2.1 Sample Processing Objective

See Hayslip et al. (1994) and Hayslip (1993).

5.2.2 Sample Processing Methods Summary

See Hayslip et al. (1994) and Hayslip (1993).

5.2.3 Sample Processing Method Calibration

See Hayslip et al. (1994) and Hayslip (1993).

5.2.4 Sample Processing Quality Control

See Chaloud and Peck (1994), Merritt (1994), and Hayslip (1993).

5.2.5 Sample Processing Method Reference

See Hayslip et al. (1994) and Hayslip (1993).

6. DATA MANIPULATIONS

6.1 Name of New or Modified Values

NA

6.2 Data Manipulation Description

NA

6.3 Data Manipulation Description

NA

7. DATA DESCRIPTION

7.1 Description of Parameters

#	Parameter SAS Name	Data Type	Len	Format	Parameter Label
65	DATE_COL	Num	8	DATE	Date sample Collected
67	LAT_DD	Num	8		Latitude (decimal degrees)
66	LON_DD	Num	8		Longitude (decimal degrees)
57	NATAMPFM	Num	8		Native Amphibian Family Richness
56	NATAMPSP	Num	8		Native Amphibian Species Richness
60	NATANDSP	Num	8		Native Anadromous Species Richness
55	NATFSHFM	Num	8		Native Fish Family Richness
54	NATFSHSP	Num	8		Native Fish Species Richness

59	NATVRTFM	Num	8	Native Vertebrate Family Richness
58	NATVRTSP	Num	8	Native Vertebrate Species Richness
49	NOALINSP	Num	8	Number of Alien Species
4	NOBENTSP	Num	8	Number of Benthic Species
19	NOCOLDSP	Num	8	Number of Cold Species
16	NOCOOLSP	Num	8	Number of Cool Species
22	NOFILTSP	Num	8	Number of Filter Feeding Species
53	NOFISHFM	Num	8	Number of Fish families
64	NOFISHIN	Num	8	Total Number of Fish Individuals
63	NOFISHSP	Num	8	Total Number of Fish Species
25	NOHERBSP	Num	8	Number of Herbivore Species
10	NOHIDRSP	Num	8	Number of Hider Species
46	NOINMDSP	Num	8	Number of Intermediate Species
34	NOINPISP	Num	8	Number of Invertivore/Piscivore Species
31	NOINVTSP	Num	8	Number of Invertivore Species
28	NOOMNVSP	Num	8	Number of Omnivore Species
37	NOPSCVSP	Num	8	Number of Piscivore Species
43	NOSENSSP	Num	8	Number of Sensitive Species
40	NOTOLTSP	Num	8	Number of Tolerant Species
61	NOVERTIN	Num	8	Total Number of Vertebrate Individuals
62	NOVERTSP	Num	8	Total Number of Vertebrate Species
13	NOWARMSP	Num	8	Number of Warm Species
7	NOWATRSP	Num	8	Number of Water Column Species
50	PCTALNIN	Num	8	Percent of Alien Individuals
51	PCTALNSP	Num	8	Percent of Alien Species
5	PCTBENIN	Num	8	Percent of Benthic Individuals
6	PCTBENSP	Num	8	Percent of Benthic Species
20	PCTCLDIN	Num	8	Percent of Cold Individuals
21	PCTCLDSP	Num	8	Percent of Cold Species
17	PCTCOOIN	Num	8	Percent of Cool Individuals
18	PCTCOOSP	Num	8	Percent of Cool Species
23	PCTFILIN	Num	8	Percent of Filter Feeding Individuals
24	PCTFILSP	Num	8	Percent of Filter Feeding Species
11	PCTHIDIN	Num	8	Percent of Hider Individuals
12	PCTHIDSP	Num	8	Percent of Hider Species
26	PCTHRBIN	Num	8	Percent of Herbivore Individuals
27	PCTHRBSP	Num	8	Percent of Herbivore Species
47	PCTINMIN	Num	8	Percent of Intermediate Individuals
48	PCTINMSP	Num	8	Percent of Intermediate Species
35	PCTINPIN	Num	8	Percent of Invert/Pisciv Individuals
36	PCTINPSP	Num	8	Percent of Invert/Pisciv Species
32	PCTINVIN	Num	8	Percent of Invertivore Individuals
33	PCTINVSP	Num	8	Percent of Invertivore Species
29	PCTOMVIN	Num	8	Percent of Omnivore Individuals
30	PCTOMVSP	Num	8	Percent of Omnivore Species
38	PCTPSVIN	Num	8	Percent of Piscivore Individuals
39	PCTPSVSP	Num	8	Percent of Piscivore Species
44	PCTSENIN	Num	8	Percent of Sensitive Individuals
45	PCTSENSP	Num	8	Percent of Sensitive Species
41	PCTTOLIN	Num	8	Percent of Tolerant Individuals
42	PCTTOLSP	Num	8	Percent of Tolerant Species
14	PCTWARIN	Num	8	Percent of Warm Individuals

15	PCTWARSP	Num	8		Percent of Warm Species
8	PCTWATIN	Num	8		Percent of Water Individuals
9	PCTWATSP	Num	8		Percent of Water Species
52	SAMPLED	Char	30		Site Sampled Code
1	STRM_ID	Char	8	$	EMAP Stream Identifier
3	VISIT_NO	Num	8	F	Visit number
2	YEAR	Num	8		Year sampled

7.1.1 Precision to which values are reported

Data were reported to the number of decimal places noted in 7.1.

7.1.2 Minimum Value in Data Set

Name	Min
DATE_COL	05/16/1994
LAT_DD	42.1114
LON_DD	-124.5862217
NATAMPFM	0
NATAMPSP	0
NATANDSP	0
NATFSHFM	0
NATFSHSP	0
NATVRTFM	0
NATVRTSP	0
NOALINSP	0
NOBENTSP	0
NOCOLDSP	0
NOCOOLSP	0
NOFILTSP	0
NOFISHFM	0
NOFISHIN	0
NOFISHSP	0
NOHERBSP	0
NOHIDRSP	0
NOINMDSP	0
NOINPISP	0
NOINVTSP	0
NOOMNVSP	0
NOPSCVSP	0
NOSENSSP	0
NOTOLTSP	0
NOVERTIN	0
NOVERTSP	0
NOWARMSP	0
NOWATRSP	0
PCTALNIN	0
PCTALNSP	0
PCTBENIN	0
PCTBENSP	0
PCTCLDIN	0
PCTCLDSP	0

PCTCOOIN 0
PCTCOOSP 0
PCTFILIN 0
PCTFILSP 0
PCTHIDIN 0
PCTHIDSP 0
PCTHRBIN 0
PCTHRBSP 0
PCTINMIN 0
PCTINMSP 0
PCTINPIN 0
PCTINPSP 0
PCTINVIN 0
PCTINVSP 0
PCTOMVIN 0
PCTOMVSP 0
PCTPSVIN 0
PCTPSVSP 0
PCTSENIN 0
PCTSENSP 0
PCTTOLIN 0
PCTTOLSP 0
PCTWARIN 0
PCTWARSP 0
PCTWATIN 0
PCTWATSP 0
VISIT_NO 1
YEAR 1994

7.1.3 Maximum Value in Data Set

Name	Max
DATE_COL	09/29/1995
LAT_DD	48.1784
LON_DD	-119.5619
NATAMPFM	4
NATAMPSP	4
NATANDSP	4
NATFSHFM	6
NATFSHSP	10
NATVRTFM	8
NATVRTSP	11
NOALINSP	1
NOBENTSP	6
NOCOLDSP	5
NOCOOLSP	7
NOFILTSP	2
NOFISHFM	6
NOFISHIN	937
NOFISHSP	10
NOHERBSP	1
NOHIDRSP	7

NOINMDSP 6
NOINPISP 4
NOINVTSP 7
NOOMNVSP 1
NOPSCVSP 1
NOSENSSP 6
NOTOLTSP 4
NOVERTIN 937
NOVERTSP 11
NOWARMSP 2
NOWATRSP 3
PCTALNIN 85.714285714
PCTALNSP 50
PCTBENIN 100
PCTBENSP 100
PCTCLDIN 100
PCTCLDSP 100
PCTCOOIN 100
PCTCOOSP 100
PCTFILIN 44.497607656
PCTFILSP 33.333333333
PCTHIDIN 100
PCTHIDSP 100
PCTHRBIN 96.49122807
PCTHRBSP 50
PCTINMIN 100
PCTINMSP 100
PCTINPIN 100
PCTINPSP 100
PCTINVIN 100
PCTINVSP 100
PCTOMVIN 33.333333333
PCTOMVSP 50
PCTPSVIN 2.6315789474
PCTPSVSP 33.333333333
PCTSENIN 100
PCTSENSP 100
PCTTOLIN 100
PCTTOLSP 100
PCTWARIN 30.681818182
PCTWARSP 50
PCTWATIN 82.5
PCTWATSP 50
VISIT_NO 3
YEAR 1995

7.2 Data Record Example

7.2.1 Column Names for Example Records

```
"DATE_COL","LAT_DD","LON_DD","NATAMPFM","NATAMPSP","NATANDSP","NATFSHFM",
"NATFSHSP","NATVRTFM","NATVRTSP","NOALINSP","NOBENTSP","NOCOLDSP",
"NOCOOLSP","NOFILTSP","NOFISHFM","NOFISHIN","NOFISHSP","NOHERBSP",
"NOHIDRSP","NOINMDSP","NOINPISP","NOINVTSP","NOOMNVSP","NOPSCVSP",
"NOSENSSP","NOTOLTSP","NOVERTIN","NOVERTSP","NOWARMSP","NOWATRSP",
"PCTALNIN","PCTALNSP","PCTBENIN","PCTBENSP","PCTCLDIN","PCTCLDSP",
"PCTCOOIN","PCTCOOSP","PCTFILIN","PCTFILSP","PCTHIDIN","PCTHIDSP",
"PCTHRBIN","PCTHRBSP","PCTINMIN","PCTINMSP","PCTINPIN","PCTINPSP",
"PCTINVIN","PCTINVSP","PCTOMVIN","PCTOMVSP","PCTPSVIN","PCTPSVSP",
"PCTSENIN","PCTSENSP","PCTTOLIN","PCTTOLSP","PCTWARIN","PCTWARSP",
"PCTWATIN","PCTWATSP","SAMPLED","STRM_ID","VISIT_NO","YEAR"
```

7.2.2 Example Data Records

```
21JUL1995,45.991677169,-122.8964313,0,0,2,2,3,2,3,0,1,2,1,0,2,203,3,0,1,1,
1,2,0,0,2,0,203,3,0,1,0.00,0.00,4.93,33.33,95.07,66.67,4.93,33.33,0.00,
0.00,19.70,33.33,0.00,0.00,4.93,33.33,19.70,33.33,80.30,66.67,0.00,0.00,
0.00,0.00,95.07,66.67,0.00,0.00,0.00,0.00,75.37,33.33,"Yes","OR001S",1,1995

06SEP1995,45.991677169,-122.8964313,0,0,2,2,4,2,4,0,1,3,1,0,2,182,4,0,2,1,
2,2,0,0,3,0,182,4,0,1,0.00,0.00,4.40,25.00,95.60,75.00,4.40,25.00,0.00,
0.00,24.18,50.00,0.00,0.00,4.40,25.00,24.18,50.00,75.82,50.00,0.00,0.00,
0.00,0.00,95.60,75.00,0.00,0.00,0.00,0.00,71.43,25.00,"Yes","OR001S",2,1995

14SEP1995,44.138895486,-123.4394569,1,1,2,4,7,5,8,0,3,4,4,1,4,454,7,0,4,5,
3,4,0,0,3,0,457,8,0,1,0.00,0.00,81.18,37.50,54.27,50.00,45.73,50.00,4.81,
12.50,14.00,50.00,0.00,0.00,46.39,62.50,9.19,37.50,86.00,50.00,0.00,0.00,
0.00,0.00,53.61,37.50,0.00,0.00,0.00,0.00,4.81,12.50,"Yes","OR003S",1,1995
```

8. GEOGRAPHIC AND SPATIAL INFORMATION

8.1 Minimum Longitude

-124 Degrees 35 Minutes 10 Seconds West (-124.5862217 Decimal Degrees)

8.2 Maximum Longitude

-119 Degrees 33 Minutes 42 Seconds West (-119.5619 Decimal Degrees)

8.3 Minimum Latitude

42 Degrees 6 Minutes 41 Seconds North (42.1114 Decimal Degrees)

8.4 Maximum Latitude

48 Degrees 10 Minutes 42 Seconds North (48.1784 Decimal Degrees)

8.5 Name of Area or Region

EPA Region 10
The sampling area included the Coast Range Ecoregion and the Yakima River Basin (Columbia Basin Ecoregion).

9. QUALITY CONTROL / QUALITY ASSURANCE

9.1 Data Quality Objectives

See Chaloud and Peck (1994), Merritt (1994), and Hayslip (1993).

9.2 Quality Assurance Procedures

See Chaloud and Peck (1994), Merritt (1994), and Hayslip (1993).

9.3 Unassessed Errors

NA

10. DATA ACCESS

10.1 Data Access Procedures

Data can be downloaded from the WWW site or contact personnel listed in Section 10.3.

10.2 Data Access Restrictions

Data can only be accessed from the WWW server.

10.3 Data Access Contact Persons

Gretchen Hayslip
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Seattle, WA 98101
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206-553-0119 (FAX)
hayslip.gretchen@epamail.epa.gov

Data Librarian EMAP-Information Management
U.S. EPA NHEERL-AED
401-782-3184
401-782-3030 (FAX)
hughes.melissa@epa.gov

10.4 Data Set Format

Data files are in ASCII comma-delimited format.

10.5 Information Concerning Anonymous FTP

Data cannot be accessed via ftp.

10.6 Information Concerning WWW

Data can be downloaded from the WWW site.

10.7 EMAP CD-ROM Containing the Data

Data are not available on CD-ROM.

11. REFERENCES

Chaloud, D.J. and D.V. Peck. 1994. Environmental Monitoring and Assessment Program - Surface Waters: Integrated Quality Assurance Project Plan for the Surface Waters Resource Group, 1994 Activities. EPA 600/X-91/080, Rev. 2.00. U.S. Environmental Protection Agency, Office of Research and Development, Las Vegas, NV 89193.

Hayslip, G. A. (editor). 1993. EPA Region 10 In-stream Biological Monitoring Handbook (for wadeable streams in the Pacific Northwest). EPA-910/9-92-013. U. S. Environmental Protection Agency - Region 10, Environmental Services Division, Seattle, WA 98101.

Hayslip, G., D.J. Klemm, J.M. Lazorchak. 1994. Environmental Monitoring and Assessment Program Surface Waters and Region 10 Regional Environmental Monitoring and Assessment Program: 1994 Pilot Field Operations and Methods Manual for Streams on the Coast Range Ecoregion of Oregon and Washington and the Yakima River Basin. Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, OH.

Lazorchak, J.M., D.J. Klemm, and D.V. Peck. (editors). 1998. Environmental Monitoring and Assessment Program - Surface Waters: Field Operations and Methods for Measuring the Ecological Condition of Wadeable Streams. EPA/620/R-94/004F. U.S. Environmental Protection Agency, Washington, D.C.

Merritt, G.D. 1994. Biological Assessment of wadeable Streams in the Coast Range Ecoregion and the Yakima River Basin: Final Quality Assurance Project Plan. Washington State Department of Ecology, Environmental Investigations and Laboratory Services, Olympia, WA, 15 pp.

Plafkin, J.L., M.T. Barbour, K.D. Porter, S.K. Gross, and R.M Hughes. 1989. apid Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish. EPA 440/4-89/001. U.S. Environmental Protection Agency, Office of Water, Washington, D.C.

12. TABLE OF ACRONYMS

13. PERSONNEL INFORMATION

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