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TFW AMBIENT MONITORING PROGRAM MANUAL
1993-94 STATUS REPORT

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Northwest Indian Fisheries Commission

for
Washington Department of Natural Resources
and the
TFW Ambient Monitoring Steering Committee

TIMBER FISH & WILDLIFE

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Introduction

The Timber-Fish-Wildlife (TFW) Ambient Monitoring program is designed to provide information on the current status of fish habitat and stream channel conditions in forested watersheds and to monitoring trends over time. TFW Ambient Monitoring is conducted cooperatively by many of the organizations participating in the TFW process including Indian Tribes, forest landowners, state natural resource agencies and environmental groups. The program was developed by and is conducted under the auspices of the Ambient Monitoring Steering Committee (AMSC) of the TFW Cooperative Monitoring, Evaluation and Research Committee (CMER).

From June of 1993 through 1994 the Northwest Indian Fisheries Commission (NWIFC) coordinated the TFW Ambient Monitoring Program under contract with the Washington Department of Natural Resources. The focus of the NWIFC effort during this period was on providing support services to organizations conducting monitoring, such as training, quality assurance, method development and database maintenance. The purpose of this report is to document the activities and accomplishments of the monitoring program (luring this period.

Major accomplishments included: the development and documentation of methodologies for monitoring salmonid spawning gravel composition (fine sediments) and summer stream temperature; development and documentation of quality assurance protocols; design and development of a spawning gravel fine sediment database; and design of a consolidated relational database to incorporate all the Ambient Monitoring Program data from various surveys and years into one relational database on the NWIFC's UNIX system. The annual training sessions on the various monitoring survey methods were well attended and 1993 and 1994 versions of the TFW Ambient Monitoring manual were widely distributed. We also acquired additional funding that allowed us to pursue development of a monitoring module for Watershed Analysis during this period. A strategy for development and implementation of monitoring within Watershed Analysis was accomplished with funding from Washington Forest Protection Association. The Watershed Analysis Monitoring Module was developed with funding from the Northwest Indian Fisheries Commission.

Future direction for the program is dominated by the need to support the development and implementation of the Watershed Analysis monitoring module. High priorities include testing and refining the procedures in the WA monitoring module and developing additional monitoring methodologies suitable for monitoring the effectiveness of WA prescriptions. In addition to new projects to support and develop Watershed Analysis monitoring, we must increase our efforts to help TFW cooperators produce useful, high quality monitoring data. To accomplish this goal we must improve our ability to provide guidance in designing monitoring plans, and continue to ratine our training, quality assurance and database services.

Project Status

This section of the report provides updates on the components of the TFW Ambient Monitoring (AM) program. The overall AM program is directed toward the goal of assisting TFW and WA participants produce useful, high quality monitoring information that achieves their monitoring objectives. Past experience has taught us that reaching this goal requires attention throughout the entire life of a monitoring study. It begins with clear identification of monitoring objectives and development of a sound study design. Use of replicable standard methods, thorough training of monitoring staff, quality assurance to identify and correct discrepancies, careful data entry and error-checking are critical. The goal is roached when the data provides meaningful results that are useful in management decision-making. Long-term storage of data and survey information must also occur so future analysis and replication of monitoring surveys is possible.

Much of our work during the current contract period, as well as during the previous history of the program, has been directed towards improving various components of the overall process that results in quality monitoring data.

Training

Thorough training of the people collecting monitoring data is a critical component of quality data collection. The foundation of our training program is the T-F-W Ambient Monitoring Program Manual. The manual provides detailed how-to instructions for conducting monitoring surveys. Updated and revised versions of the manual were produced in 1993 and 1994. The 1993 manual incorporated new methods for monitoring spawning gravel fine sediments and stream temperature. The 1994 manual includes updates and revisions to the existing modules as well as a new section describing the protocols used in the quality assurance program. The TFW Ambient Monitoring Program manual is the most visible ambassador of the program. Over 1000 copies of the 1993 manual were distributed to TFW participants and interested parties in the Pacific Northwest.

In addition to the monitoring manual, NWIFC provides direct training to potential monitoring participants through training workshops. Workshop sessions coveting the various survey modules are provided each year prior to the sampling season and are well attended (Table 1). In 1993, we conducted five one-day workshops for a total of 89 people. In 1994, attendance increased to 137 participants (195 people pro-registered). Tribal cooperators were the primary participants for both years with some state agency and timber industry involvement. Non-TFW participation was light in [993, but increase dramatically in 1994 to include participation from Oregon, Idaho and California, indicating that there is a large, unfilled regional demand for thorough training sessions coveting stream habitat monitoring methods.

Although the workshops are an important training service, one-on-one field training is still essential for field crews to promote consistent, replicable data collection. NWIFC provided numerous on-site field training visits during the 1993-94 field season (Table 2). We provided training to 45 people in the 1993 season and 159 people in the 1994 season. The 1994 season saw a large increase in non-TFW participation from colleges offering technical natural resource courses (many displaced timber workers) to the U.S. Army Corps of Engineers. These on-site training sessions also require extensive state wide travel from Forks to Nespelem. A list of 1993-94 participants is provided in Table 3.

Quality Assurance

Another critical element for cooperators to collect quality data is a quality assurance (QA) plan. The TFW Ambient Monitoring Program provides quality assurance services necessary for proper planning, training, and evaluation of QA plans. This is accomplished by providing protocols that are designed to improve the accuracy and repeatability of survey data by identifying and correcting surveyor bias and inconsistencies in application of the methods at the onset of the surveys. They also provide a means of documenting data quality and identifying needed improvements in the survey methods.

Quality assurance is a recommended, but voluntary, component of the TFW Ambient Monitoring program that is utilized by most participants. The NWIFC provides quality assurance services at no charge when requested by organizations conducting Ambient Monitoring surveys. The protocols used to conduct quality assurance surveys are described in the 1994 version of the T-F-W Ambient Monitoring Program Manual.

Organizations conducting monitoring surveys initiate the quality assurance component of the program by contacting the NWIFC and requesting a quality assurance visit. Quality assurance is accomplished in one of two ways depending on the type of monitoring. For spawning gravel fine sediment and stream temperature surveys, a qualified Ambient Monitoring quality assurance (QA) representative observes the cooperator field crew collecting data and compares their technique with the methods described in the T-F-W Ambient Monitoring Program Manual. Discrepancies are noted on a form and discussed with the field crew. This procedure is based on the assumption that correct application of the survey methods will result in accurate and repeatable data. A different quality assurance method is used for the reference point, habitat unit and large woody debris survey modules. In these cases, the Ambient Monitoring QA crow and the cooperator field crew both survey the same stream reach and compare results. In addition to identifying discrepancies in the application of the method, this technique also can be used to evaluate the repeatability of the data collected.

Quality assurance surveys were conducted for both 1993 and 1994 field seasons. In 1993, the QA field crow provided a total of 12 quality assurance surveys for the Habitat Unit Survey (5), Large Woody Debris Survey (2), and Salmonid Spawning Gravel Composition (5) modules (Table 4). The results of these replicate surveys have provided cooperators with valuable information on how their crews are performing so they can pinpoint application errors and training needs. The results of the replicate surveys have also been invaluable: in identifying method problems for refinement and/or testing.

One of our primary findings was the need to promote intensive pre-season training and QA services. The goal is to get the cooperator field crews up to speed through training and conducting replicate surveys before they collect data for their projects. This provides the cooperator with quality data from the start and prevents mid- or late-season surprises.

In 1994, the QA field crew has so far provided 12 quality assurance surveys including the Habitat Unit Survey (3), the Large Woody Debris Survey (4), and the Salmonid Spawning Gravel Composition (5) modules. The results of these replicate surveys indicate that more intensive training workshops and method refinements are effective in improving the repeatability of the monitoring modules.

However, as the table shows, many cooperators are not taking advantage of QA services early in the season. This is generally due to short cooperator project start-up times that lead to hiring and equipment acquisition problems at the start of the field season. This results in pressure to begin data collection and postpone training visits and QA. Although it is the responsibility of the cooperator to request QA services, experience has shown that we often need to initiate the first contact to explain the advantages of pre-season services and make appointments for QA surveys.

The results of the replicate surveys have been effective in documenting problem areas in the methods such as bankfull width locations for LWD surveys and habitat unit boundary locations in higher gradient stream reaches or sections. This highlights the need to provide more testing and refinement of current modules as well as a need for larger scale testing of individual modules to provide a baseline for determining significant threshold levels of human, method, and background variability. Documenting variability is important for determining the limitations of the monitoring methods so that cooperators can best design their monitoring project to provide the highest quality information.

Standard Monitoring Methods

During the 1993-94 field seasons we implemented new survey methodologies for salmonid spawning gravel composition (fine sediments) and summer stream temperature. These modules first appeared in the 1993 T-F-W Ambient Monitoring program manual.

The salmonid spawning gravel composition module incorporates a statistically rigorous design for sub-sampling spawning gravel composition within a stream segment. To our knowledge, this is the only method available that provides a valid characterization of spawning gravel composition on a stream segment scale appropriate for use in Watershed Analysis. The stream temperature module is based on a sampling design used in previous TFW temperature studies. In addition to stream temperature data collected at a point, additional interpretive information (such as canopy closure, bankfull width etc.) is collected from a 600 meter long thermal roach located upstream of the point where temperature data is collected.

In addition to implementing the two new modules, we also conducted testing and evaluation of the existing reference point, habitat unit and large woody debris modules. Information from quality assurance surveys and a pilot test of observer variability was used to identify factors contributing to survey variability. After initial testing indicated a need to improve the accuracy of surface area calculations, a more intensive study was conducted as part of a group internship with a TESC quantitative methods class. This resulted in the incorporation of improved procedures for measuring unit lengths and widths in the 1994 manual.

Other priority projects for testing and refining existing methods include: comparing the use of shovels and McNeil samplers to collect spawning gravel samples; improving the repeatability of bankfull width measurements; examining discharge related variation in habitat unit surveys; and evaluating observer variation in habitat unit and LWD surveys under a variety of channel conditions.

Improvements were also made in the hand-entry field forms for each module. These field forms were designed to provide: consistent header information compatible with the TFW database; a user-friendly format which provides optimal error-checking of data and calculations; larger data entry spaces to limit illegible entry problems and provide fewer transcription errors when transferring the data into a database; and efficient data tracking and documentation for cooperator QA plans.

Database maintenance and new database development

Once data is collected, it must be input into a database, analyzed and stored for future use.

Most data is typically collected and used by TFW participants for local processes and applications such as Watershed Analysis, Resource Management Plan (RMP) evaluation and watershed planning. In addition to being used immediately in local applications, the data is stored in the state wide TFW Ambient Monitoring database for future use by TFW participants. Data is input into the state-wide TFW Ambient Monitoring database through the use of scan-able forms or by hand entry using a database screen entry form. The data is checked for errors and the database is edited accordingly. Once the database is edited, initial data analysis occurs and summary reports are generated. The summary reports have been designed to provide information in a format useful in Watershed Analysis. This information is provided to the organization that conducted the monitoring surveys, Watershed Analysis teams and other TFW participants who request it.

Appendix A shows stream segments in the TFW Ambient Monitoring database where stream surveys were conducted from 1989-93, organized by year and WRIA stream number.

During the past year, a new database was developed for spawning gravel composition data collected using the new spawning gravel survey method. The main SEDIMENT database resides on the NWIFC's UNIX system, with a companion R:BASE component that can be used for data entry, error checking and data analysis on personal computers. Appendix B contains a data dictionary defining tables and columns in the SEDIMENT database.

Over the six years that TFW Ambient Monitoring data has been collected, it has been entered into a variety of databases. Typically a new database was used each time that there were changes in survey parameters as the methodologies were refined and expanded. Over the years, this system of multiple database,,; has become increasingly unwieldy. The situation was exacerbated by the need to develop new databases for spawning gravel composition and stream temperature data.

To solve this problem, NWIFC has undertaken the design and development of a single relational database that will include data from all years and all surveys. The main database will reside on the NWIFC UNIX system. A compiled R:BASE version of the database will be available for use on personal computers by TFW participants. The spawning gravel composition database was used as a prototype for this new system. Design of the system has been completed (Appendix C) and programming of the system is currently underway.

Watershed Analysis Monitoring

During the spring and summer of 1994, the Ambient Monitoring Steering Committee (AMSC) initiated work on a monitoring component for Watershed Analysis (WA) at the request of the

Department of Natural Resources anti CMER/CESC. This work was (lone by NWIFC under the supervision of AMSC with separate funding provided by the Washington Forest Protection Association (WFPA) and NWIFC.

The first phase of this effort was completion of a scoping project to develop a strategy to implement WA monitoring (Schuett-Hames and Pess, 1994). The strategy report: (1) identified potential purposes and functions of monitoring in the context of WA; (2) examined the feasibility of using WA causal mechanism reports to build watershed specific monitoring plans; and (3) identified monitoring situations likely to be encountered and the monitoring parameters and methods needed for monitoring them. It also provided a structure for the WA Monitoring Module, and recommendations for integrating the development and implementation of WA monitoring into the AMSC/CMER work plan. Some of the key conclusions and recommendations of the strategy report include:

* Watershed Analysis monitoring must evaluate triggering mechanisms and input processes to determine the effectiveness of WA prescriptions. Monitoring input processes is important to provide feedback on the performance of prescriptions and to identify potential problems before they are translated into detectable adverse resource effects. Stream channel, fish habitat and water quality conditions must also be monitored to determine if the resource protection objectives of WA are being met.

*WA is an excellent foundation for developing a watershed-specific monitoring plan. The causal mechanism reports provide monitoring hypotheses that link input processes with channel and resource responses. These can be used to identify appropriate monitoring parameters and locations.

*Development of standard monitoring methods should begin as soon as possible for the high priority parameters identified as most likely to be in high demand for WA monitoring. Methods to measure changes in channel morphology, input processes and triggering mechanisms are badly needed.

*Technical assistance from the TFW Ambient Monitoring Program is needed to support local WA monitoring teams and ensure consistent data collection on a state-wide basis. The appropriate role of the TFW AM program in implementing WA monitoring includes developing standard methods, conducting training, providing quality assurance, assisting with data processing and analysis, and maintaining the state-wide database. To successfully implement WA monitoring, a stable long term funding source for the monitoring program must be secured.

Following completion of the strategy report, we proceeded with development of the WA module. The WA monitoring module was approved by TFW's CMER and Administration Committees in August 1994. Unfortunately, we missed the deadline to get material to the Forest Practices Board for their approval. We plan to test and refine the WA Monitoring module on a voluntary basis during the coming year and prepare it for inclusion into the next version of the WA manual.

Future Directions

We expect the emphasis of the TFW Ambient Monitoring Program to be focused in two main goals during the next one to two years: 1) further development and implementation of WA monitoring, and 2) continuing improvement of TFW Ambiet Monitoring Program functions and services that result in high quality monitoring information.

We are currently proceeding with the implementation of WA monitoring with funding from the Washington Forest Protection Association (WFPA). This will allow us to undertake two important tasks.

I) Test, evaluate, and refine the WA monitoring module. The purpose of this task is to determine how the monitoring module works and identify parts that need improvement. To accomplish this task, we will evaluate the experience of WA teams using the monitoring module in approximately five watersheds. A representative of the Ambient Monitoring Program will observe and assist each team as they use the module to develop monitoring plans by attending meetings, reviewing work products, interviewing participants and answering questions posed by the team. The information gathered will be used to identify which parts of the procedure work well, which parts need improvement, and why. We will attempt to include a representative sample of watersheds from regions around the state.

2) Develop CMER-approved WA monitoring methods for high priority methods. The purpose of this task is to identify and document standard methods for parameters where CMER-approved methods are lacking. In the next year we will be working on methods for the following high priority parameters:

* Iterative landslide inventory (remote)
* Rain-on-snow zone vegetation (remote)
* Spawning gravel availability
* Channel bed aggradation and degradation
* Channel widening, braiding, migration, bank erosion
* Riparian vegetation monitoring (remote)
* Mass wasting road assessment procedure
* Channel substrate size
* Surface erosion survey

Other tasks that need to be done to implement WA monitoring over time include:

* Develop additional WA monitoring methods identified in the strategy report (Schuett-Hames and Pess, 1994; see Appendix D).
* Work with the federal watershed analysis monitoring committee to develop compatible monitoring guidelines for state and federal watershed analysis processes in Washington State.
* Test and refine data analysis and interpretation procedures for WA monitoring.
* Revise the monitoring module for' subsequent versions of WA manual.
* Clarify procedures for the use of monitoring data to evaluate WA effectiveness at the watershed level.
* Clarify procedures for the use of monitoring data to ratine WA methods.
* Improve capability to interpret monitoring data by evaluating the utility of a regional network of reference sites representing natural conditions/productive habitat.
* Develop a procedure for preparing resource recovery prognoses to help interpret WA monitoring data.

The following tasks and functions are necessary to achieve the TFW Ambient Monitoring Program goal of providing high quality monitoring information.

* Improve our capability to provide help and guidance to TFW participants in developing monitoring plans that will accomplish their goals.
* Test and refine existing methods. Testing and refinement of the habitat unit, LWD and spawning gravel fine sediment survey modules should continue so changes can be incorporated in future versions of the methods manual. We anticipate a continuing need for testing and refinement of new and existing methods.
* Continue the TFW Ambient Monitoring quality assurance service. There is an on-going year-round need to conduct and analyze QA surveys. Most QA visits are requested during the summer-fall field season, but some QA for spawning gravel processing occurs year-round. Analysis of QA results takes place primarily in the winter.
* QA protocols and procedures need to be developed for new monitoring methods as they are brought on line.
* Finish development and implementation of the consolidated relational database:
* Expand the relational database as new parameters and methods come on-line. As new monitoring methods are developed, the data collected will need to be stored within the relational database.
* Assist cooperators in data entry and processing. There is an on-going year-round need to assist cooperators in data entry and processing. Most data entry and processing occurs primarily in the winter.
* Revise and distribute the monitoring methods manual. The monitoring methods manual is revised annually prior to the summer field sea,son to include new methods that have been

developed as well as improvements in existing methods.
* Conduct group training sessions. Group training sessions are held each year prior to the field season in the late spring and early summer.
* Provide on-site field training and assistance. There are year--round requests for field assistance visits. Most requests occur (luring the summer and fall.

In addition to these tasks, there is an ongoing need to identify sources of funding to accomplish both specific tasks and ongoing program functions. At the present time, the program has funding from WFPA to evaluate, test and refine the WA monitoring module, develop high priority WA monitoring methods, and continue manual production, training, quality assurance and database services at the current level of effort through September of 1995. We have submitted a budget request to CMER to fund the program through the 1995-97 biennium. We have also submitted an Environmental Technology Initiative proposal in partnership with the Department of Ecology for funding to develop additional WA monitoring methods.

Conclusion

TFW has been, and continues to be, a very dynamic context for monitoring. The development and implementation of Watershed Analysis demonstrates how rapidly monitoring needs are evolving in the arena of forestry-fisheries interactions as resource management increases in sophistication. To play a useful role in helping TFW participants meet their needs for monitoring information, our monitoring program must remain attentive and flexible, responding rapidly to the changing needs of TFW participants. In the process of responding to change, the program must not lose track of its fundamental purpose: to help TFW participants obtain high quality monitoring data to meet their information needs. We must continue to pay attention to, and improve upon, the elements of the program that contribute to its success in providing high quality data. These elements include: monitoring plan design; training; standard methods; quality assurance; database maintenance; data analysis; and data interpretation. Our challenge for the foreseeable future appears to be maintaining, and improving, the quality of TFW monitoring data, while responding to the rapidly evolving needs for, and uses of, monitoring information in the TFW arena.

References

Schuett-Hames, D.E. and G. Pess. 1994. A strategy to implement Watershed Analysis monitoring. TFW-AM14-94-001 #72. Washington State Department of Natural Resources Forest Practices Div./Northwest Indian Fisheries Commission. Olympia.

APPENDIX A

TFW AMBIENT MONITORING STREAM SURVEY SEGMENTS; 1989-1993

1993 TFW AMBIENT MONITORING STREAM SURVEYS

WRIA	STREAM NAME	SEG #	RM (LOW)	RM (UPR)	SEG LEN(M)	SURVEY TYPE	DATA AFFIL	SUM RPT	DATA-BASE	FILE ID	FIELD FORMS	GIS	USGS TOPO QUAD MAP
7.0291	TOLT R.	2	1.70	6.00	6264	S	TULALIP		DISK		YES		CARNATION, LAKE JOY
7.0291	N.F. TOLT R.	5	9.80	10.50	1126	S	TULALIP		DISK		YES		LAKE JOY
7.0300	STOSSEL	24	0.30	0.80	1107	S	TULALIP		DISK		YES		LAKE JOY
10.0800	CLEARWATER	2	1.10	2.30	2000	R,H,L	MUCKLE		SCAN	DM	YES		CYCLONE CREEK
10.0800	CLEARWATER	3	2.30	4.10	2600	R,H,L	MUCKLE		SCAN	DN	YES		CYCLONE CREEK, BEARHEAD MTN.
10.0800	CLEARWATER	4	4.10	4.80	1600	R,H,L	MUCKLE		SCAN	DO	YES		BEARHEAD MOUNTAIN
10.0800	CLEARWATER	5	4.80	5.90	1700	R,H,L	MUCKLE		SCAN	DP	YES		BEARHEAD MOUNTAIN
10.0800	CLEARWATER	6	5.90	6.80	2100	R,H,L	MUCKLE		SCAN	DQ	YES		BEARHEAD MOUNTAIN
11.0086	OHOP	1	0.00	0.10	600	S	NISQUAL		DISK		YES		EATONVILLE
11.0086	OHOP	2	0.10	4.30	600	S	NISQUAL		DISK		YES		EATONVILLE, TANWAX LAKE
11.0086	OHOP	3	4.30	6.10	600	S	NISQUAL		DISK		YES		EATONVILLE, TANWAX LAKE
11.0086	OHOP	1T	0.30	1.00	600	T	NISQUAL		DISK		YES		EATONVILLE
11.0086	OHOP	2T	2.30	3.00	600	T	NISQUAL		DISK		YES		EATONVILLE
11.0086	OHOP	3T	6.20	8.80	600	T	NISQUAL		DISK		YES		TANWAX LAKE
11.0092	LYNCH	4T	0.20	0.80	600	T	NISQUAL		DISK		YES		TANWAX LAKE
11.0096	TWENTYFIVE MILE	2	0.20	1.00	600	S	NISQUAL		DISK		YES		TANWAX LAKE, LAKE KAPOWSIN
11.0096	TWENTYFIVE MILE	5T	0.20	0.60	600	T	NISQUAL		DISK		YES		TANWAX LAKE
11.0101	MASHEL R.	1	0.00	1.70	600	S	NISQUAL		DISK		YES		EATONVILLE
11.0101	MASHEL R.	2	1.70	5.30	600	S	NISQUAL		DISK		YES		EATONVILLE
11.0101	MASHEL R.	8	6.70	7.00	600	S	NISQUAL		DISK		YES		ELBE
11.0101	MASHEL R.	16	14.50	15.50	600	S	NISQUAL		DISK		YES		ASHFORD
11.0101	MASHEL R.	11T	7.60	7.90	600	T	NISQUAL		DISK		YES		ELBE
11.0101	MASHEL R.	15T	11.40	11.70	600	T	NISQUAL		DISK		YES		ELBE
11.0101	MASHEL R.	16T	14.60	14.90	600	T	NISQUAL		DISK		YES		ASHFORD
11.0101	MASHEL R.	17T	15.60	15.90	600	T	NISQUAL		DISK		YES		ASHFORD
11.0101	MASHEL R.	6T	0.60	1.10	600	T	NISQUAL		DISK		YES		EATONVILLE
11.0101	MASHEL R.	7T	5.00	5.50	600	T	NISQUAL		DISK		YES		EATONVILLE
11.0102	LITTLE MASHEL R.	8T	0.30	0.60	600	T	NISQUAL		DISK		YES		EATONVILLE
11.0102	LITTLE MASHEL R.	9T	2.10	2.40	600	T	NISQUAL		DISK		YES		ELBE
11.0103	MIDWAY	10T	0.00	0.30	600	T	NISQUAL		DISK		YES		ELBE
11.0110	MASHEL R. TRIB	12T	0.10	0.40	600	T	NISQUAL		DISK		YES		ELBE
11.0111	BEAVER	2	0.80	1.00	600	S	NISQUAL		DISK		YES		ELBE
11.0111	BEAVER	13T	0.50	0.80	600	T	NISQUAL		DISK		YES		ELBE
11.0111	BEAVER	14T	2.30	2.60	600	T	NISQUAL		DISK		YES		ELBE
11.0114	BUSYWILD	19T	0.10	0.40	600	T	NISQUAL		DISK		YES		ASHFORD
11.0114	BUSYWILD	20T	4.10	4.40	600	T	NISQUAL		DISK		YES		ASHFORD
11.0121	S.F. MASHEL R.	18T	15.60	15.90	600	T	NISQUAL		DISK		YES		ASHFORD
14.0029	MILL	1	2.60	3.80	1300	R,H,L	SQUAXIN		SCAN	DA	YES		
15.0029	MILL	1	2.60	3.80	1300	S	SQUAXIN		SCAN	DA	YES		
14.0035	GOLDSBOROUGH	6	4.50	5.80	1600	R,H,L	SQUAXIN		SCAN	DB	YES		
15.0035	GOLDSBOROUGH	6	4.50	5.80	1600	S	SQUAXIN		SCAN	DB	YES		
14.0049	JOHNS	2	0.50	1.40	1100	R,H,L	SQUAXIN		SCAN	DC	YES		
15.0049	JOHNS	2	0.50	1.40	1100	S	SQUAXIN		SCAN	DC	YES		
14.0057	DEER	2	2.20	2.90	488	R,H,L	SQUAXIN		SCAN	DF	YES		
15.0057	DEER	2	2.20	2.90	488	S	SQUAXIN		SCAN	DF	YES		
14.0067	MALANEY	1	0.20	0.50	620	R,H,L	SQUAXIN		SCAN	DD	YES		
15.0067	MALANEY	1	0.20	0.50	620	S	SQUAXIN		SCAN	DD	YES		
14.0069	CAMPBELL	1	0.00	1.20	743	R,H,L	SQUAXIN		SCAN	DE	YES		
15.0069	CAMPBELL	1	0.00	1.20	743	S	SQUAXIN		SCAN	DE	YES		
15.0377	LITTLE ANDERSON	1	0.50	0.25	580	R,H,L	USFW		DISK		YES		SEABECK
15.0377	LITTLE ANDERSON	2	0.25	0.90	1260	R,H,L	USFW		DISK		YES		SEABECK
15.0377	LITTLE ANDERSON	3	0.90	1.50	1260	R,H,L	USFW		DISK		YES		SEABECK
15.0379	L. ANDERSON TRIB	1	0.00	0.25	450	R,H,L	USFW		DISK		YES		SEABECK
15.0379	L. ANDERSON TRIB	2	0.25	0.35	150	R,H,L	USFW		DISK		YES		SEABECK
15.0382	L. ANDERSON TRIB	1	0.00	0.30	690	R,H,L	USFW		DISK		YES		SEABECK, POULSBO
15.0382	L. ANDERSON TRIB	2	0.30	0.80	520	R,H,L	USFW		DISK		YES		POULSBO
15.0382	L. ANDERSON TRIB	3	0.80	1.20	380	R,H,L	USFW		DISK		YES		POULSBO
15.0385	L. ANDERSON TRIB	1	0.00	0.40	700	R,H,L	USFW		DISK		YES		POULSBO
15.0386	L. ANDERSON TRIB	1	0.00	0.60	1100	R,H,L	USFW		DISK		YES		POULSBO
15.0389	BIG BEEF	1	0.10	1.30		R, H, L	PNPTC		DISK				SEABECK
15.0389	BIG BEEF	2	1.30	5.30		R, H, L	PNPTC		DISK				SEABECK, WILDCAT LAKE
15.0389	BIG BEEF	4	6.00	6.70		R, H, L	PNPTC		DISK				WILDCAT LAKE
15.0389	BIG BEEF	6	7.90	9.00		R, H, L	PNPTC		DISK				WILDCAT LAKE
15.0404	STAVIS CR.	1	0.15	0.50	890	R,H,L	USFW		DISK		YES		WILDCAT LK, HOLLY

1993 TFW AMBIENT MONITORING STREAM SURVEYS

WRIA	STREAM NAME	SEG #	RM (LOW)	RM (UPR)	SEG LEN(M)	SURVEY TYPE	DATA AFFIL	SUM RPT	DATA-BASE	FILE ID	FIELD FORMS	GIS	USGS TOPO QUAD MAP
15.0404	STAVIS CR.	2	0.50	1.40	1600	R,H,L	USFW		DISK		YES		HOLLY, WILDCAT LK
15.0404	STAVIS CR.	3	1.40	1.50	300	R,H,L	USFW		DISK		YES		WILDCAT LK
15.0404	STAVIS CR.	4	1.50	3.60	4450	R,H,L	USFW		DISK		YES		WILDCAT LK, HOLLY
15.0404	STAVIS CR.	5	3.60	3.80	490	R,H,L	USFW		DISK		YES		HOLLY
15.0404	STAVIS CR.	6	3.80	4.00	500	R,H,L	USFW		DISK		YES		HOLLY
15.0405	STAVIS TRIB.	1	0.00	1.10	2040	R,H,L	USFW		DISK		YES		HOLLY
15.0405	STAVIS TRIB.	2	1.10	1.70	800	R,H,L	USFW		DISK		YES		HOLLY
15.0405	STAVIS TRIB.	3	1.70	2.00	480	R,H,L	USFW		DISK		YES		HOLLY
15.0405	STAVIS TRIB.	4	2.00	2.10	100	R,H,L	USFW		DISK		YES		HOLLY
15.0406	STAVIS TRIB.	1	0.00	0.50	640	R,H,L	USFW		DISK		YES		HOLLY
15.0406	STAVIS TRIB.	2	0.50	0.80	500	R,H,L	USFW		DISK		YES		HOLLY
15.0407	BOYCE CR.	1	0.10	0.40	600	R,H,L	USFW		DISK		YES		HOLLY
15.0407	BOYCE CR.	2	0.40	0.70	620	R,H,L	USFW		DISK		YES		HOLLY
15.0407	BOYCE CR.	3	0.70	1.00	810	R,H,L	USFW		DISK		YES		HOLLY
15.0407	BOYCE CR.	4	1.00	1.60	1200	R,H,L	USFW		DISK		YES		HOLLY
15.0408	HARDING CR.	1	0.00	0.30	600	R,H,L	USFW		DISK		YES		HOLLY
15.0408	HARDING CR.	2	0.30	0.55	420	R,H,L	USFW		DISK		YES		HOLLY
15.0408	HARDING CR.	3	0.55	0.65	280	R,H,L	USFW		DISK		YES		HOLLY
15.0408	HARDING CR.	4	0.65	0.80	250	R,H,L	USFW		DISK		YES		HOLLY
15.0408	HARDING CR.	5	0.80	1.00	400	R,H,L	USFW		DISK		YES		HOLLY
15.0409	HARDING TRIB	1	0.00	0.50	930	R,H,L	USFW		DISK		YES		HOLLY
15.0410	HARDING TRIB	1	0.00	0.35	570	R,H,L	USFW		DISK		YES		HOLLY
15.0454	LITTLE TAHUYA	1	0.00	1.40	2155	RHL	PNPTC		DISK		YES		LAKE WOOTON
15.0454	LITTLE TAHUYA	2	1.40	2.35	1500	RHL	PNPTC		DISK		YES		LAKE WOOTON
15.0495	BIG MISSION	1	0.00	0.60	1000	RHL	PNPTC		DISK		YES		BELFAIR
15.0495	BIG MISSION	2	0.60	1.30	1400	RHL	PNPTC		DISK		YES		BELFAIR
15.0495	BIG MISSION	3	1.30	1.50	700	RHL	PNPTC		DISK		YES		BELFAIR
15.0495	BIG MISSION	4	1.50	1.70	600	RHL	PNPTC		DISK		YES		BELFAIR
15.0495	BIG MISSION	5	1.70	2.30	1076	RHL	PNPTC		DISK		YES		BELFAIR
15.0495	BIG MISSION	6	2.30	3.00	1885	RHL	PNPTC		DISK		YES		BELFAIR,LAKE WOOTON
15.0495	BIG MISSION	7	3.00	4.10	1800	RHL	PNPTC		DISK		YES		BELFAIR, LAKE WOOTON
15.0495	BIG MISSION	8	4.10	5.80	3000	RHL	PNPTC		DISK		YES		BELFAIR
15.0496	BIG MISSION TRIB.	1	0.00	0.80	1800	RH	PNPTC		DISK		YES		BELFAIR
15.0498	BIG MISSION TRIB.	1	0.00	1.70	2700	RH	PNPTC		DISK		YES		LAKE WOOTEN
15.0499	BIG MISSION TRIB.	1	0.00	0.20	340	RHL	PNPTC		DISK		YES		BELFAIR
15.0499	BIG MISSION TRIB	2	0.20	0.90	1600	RHL	PNPTC		DISK		YES		BELFAIR
15.0500	BIG MISSION TRIB.	1	0.00	0.40	810	RH	PNPTC		DISK		YES		BELFAIR
15.0505	COURTNEY	1	0.00	0.55	800	RHL	PNPTC		DISK		YES		BELFAIR
15.0505	COURTNEY	2	0.55	0.90	500	RHL	PNPTC		DISK		YES		BELFAIR
15.0505	COURTNEY	3	0.90	2.40	1500	RHL	PNPTC		DISK		YES		BELFAIR
17.0089	RIPLEY CR.	1	0.00	0.90	1214	RHL	PNPTC		DISK		YES		MT. WALKER, UNCAS
17.0089	RIPLEY CR.	2	0.90	1.60	1300*	R	PNPTC		DISK		YES		UNCAS
17.0090	HOWE CR.	1	0.00	0.50			PNPTC						MT. WALKER, UNCAS
17.0090	HOWE CR.	2	0.50	0.60			PNPTC						UNCAS
17.0090	HOWE CR.	3	0.60	1.00			PNPTC						UNCAS
17.0090	HOWE CR.	4	1.00	1.50			PNPTC						UNCAS
17.0090	HOWE CR.	5	1.50	1.70			PNPTC						UNCAS
17.0090	HOWE CR.	6	1.70	2.00			PNPTC						UNCAS
17.0090	HOWE CR.	7	2.00	3.00			PNPTC						UNCAS
17.0170	THORNDYKE CR.	1	0.40	0.70	480	R,H,L	USFW		DISK		YES		LOFALL
17.0170	THORNDYKE CR.	2	0.70	1.10	599	R,H,L	USFW		DISK		YES		LOFALL
17.0170	THORNDYKE CR.	3	1.10	1.30	400	R,H,L	USFW		DISK		YES		LOFALL
17.0170	THORNDYKE CR.	4	1.30	2.50	2400	R,H,L	USFW		DISK		YES		LOFALL
17.0170	THORNDYKE CR.	5	2.50	3.00	1436	R,H,L	USFW		DISK		YES		LOFALL
17.0170	THORNDYKE CR.	6	3.00	3.30	250	R,H,L	USFW		DISK		YES		LOFALL
17.0170	THORNDYKE CR.	7	3.30	3.70	400	R,H,L	USFW		DISK		YES		LOFALL
17.0171	THORN DYKE TRIB.	1	0.00	1.50	3100	R,H,L	USFW		DISK		YES		LOFALL, QUILLENE
17.0174	THORN DYKE TRIB.	1	0.00	0.30	529	R,H,L	USFW		DISK		YES		LOFALL
17.0174	THORN DYKE TRIB.	2	0.30	0.60	490	R,H,L	USFW		DISK		YES		LOFALL
17.0174	THORN DYKE TRIB.	3	0.60	0.70	100	R,H,L	USFW		DISK		YES		LOFALL
17.0174A	THORN DYKE TRIB.	1	0.00	0.10	200	R,H,L	USFW		DISK		YES		LOFALL
17.0174B	THORN DYKE TRIB	1	0.00	0.30	432	R,H,L	USFW		DISK		YES		LOFALL
17.0174B1	THORN DYKE TRIB.	1	0.00	0.20	356	R,H,L	USFW		DISK		YES		LOFALL
17.0174B1	THORN DYKE TRIB.	2	0.20	0.30	100	R,H,L	USFW		DISK		YES		LOFALL

1993 TFW AMBIENT MONITORING STREAM SURVEYS

WRIA	STREAM NAME	SEG #	RM (LOW)	RM (UPR)	SEG LEN(M)	SURVEY TYPE	DATA AFFIL	SUM RPT	DATA-BASE	FILE ID	FIELD FORMS	GIS	USGS TOPO QUAD MAP
17.0174C	THORN DYKE TRIB.	1	0.00	0.10	100	R,H,L	USFW		DISK		YES		LOFALL
17.0179A	THORN DYKE TRIB.	1	0.00	0.10	100	R,H,L	USFW		DISK		YES		LOFALL
17.0179B	THORN DYKE TRIB.	1	0.00	0.20	400	R,H,L	USFW		DISK		YES		LOFALL
17.0181	SHINE CR.	1	0.20	0.60	799	R	USFW		DISK		YES		LOFALL
17.0181	SHINE CR.	2	0.60	1.00	713	R,H,L	USFW		DISK		YES		LOFALL, PORT LUDLOW
17.0181	SHINE CR.	3	1.00	1.20	289	R,H,L	USFW		DISK		YES		PORT LUDLOW
17.0181	SHINE CR.	4	1.20	1.30	248	R,H,L	USFW		DISK		YES		PORT LUDLOW
17.0181	SHINE CR.	5	1.30	1.80	900	R,H	USFW		DISK		YES		PORT LUDLOW
17.0181	SHINE CR.	6	1.80	2.80	1810	R,H,L	USFW		DISK		YES		PORT LUDLOW
17.0181A	SHINE TRIB.	1	0.00	0.10	228	R,H,L	USFW		DISK		YES		PORT LUDLOW
17.0182	SHINE TRIB.	1	0.00	0.40	810	R	USFW		DISK		YES		LOFALL
17.0219	SNOW	0	0.00	0.50		R,H,L	PNPTC		DISK				UNCAS QUAD
17.0219	SNOW	1	0.50	3.50		R,H,L	PNPTC		DISK				UNCAS QUAD
17.0219	SNOW	2	3.50	4.90		R,H,L	PNPTC		DISK				UNCAS QUAD
17.0219	SNOW	3	4.90	6.40		R,H,L	PNPTC		DISK				UNCAS QUAD
17.0245	SALMON CR.	3	1.50	2.00	400*	R,H,L	PNPTC		DISK		YES		UNCAS
17.0245	SALMON CR.	4	2.00	2.20	765	R,H,L	PNPTC		DISK		YES		UNCAS
17.0245	SALMON CR.	5	2.20	3.50	2820	R,H,L	PNPTC		DISK		YES		UNCAS
18.0160	MCDONALD CR.	3	4.90	6.90	3465	R,H,L	PNPTC		DISK		YES		CARLSBORG
18.0160	MCDONALD CR.	4	6.90	7.90	2106	R,H,L	PNPTC		DISK		YES		CARLSBORG
18.0160	MCDONALD CR.	5	7.90	8.50	1005	R,H,L	PNPTC		DISK		YES		CARLSBORG
18.0160	MCDONALD CR.	6	8.50	9.40	830	R,H,L	PNPTC		DISK		YES		CARLSBORG
18.0160	MCDONALD CR.	7	9.40	9.90	1600	R	PNPTC		DISK		YES		CARLSBORG
20.0251	KAHKWA	1	0.50	0.90	600M	L	HOH		DISK		YES		INDIAN PASS
20.0252	MOSQUITO	1	0.10	0.40	600M	T	HOH		DISK		F.1		INDIAN PASS
20.0254	OLALLIE	1	0.30	0.70	600M	L	HOH		DISK		YES		INDIAN PASS
20.0255	INDIAN	1	0.30	0.70	600M	T	HOH		DISK		F.1		INDIAN PASS
20.0255	INDIAN	1	0.30	0.70	600M	L	HOH		DISK		YES		INDIAN PASS
20.0257	HADES	1	0.10	0.40	600M	T	HOH		DISK		F.1		INDIAN PASS, WINFIELD CR
20.0257	HADES	1	0.10	0.40	600M	L	HOH		DISK		YES		INDIAN PASS, WINFIELD CR
20.0430	NOLAN	1			600M	T	HOH		DISK		F.1		KALALOCH RIDGE
20.0442	WINFIELD	1	0.20	0.50	600M	T	HOH		DISK		F.1		WINFIELD CR
20.0451	WILLOUGHBY	1	0.10	0.40	600M	T	HOH		DISK		F.1		WINFIELD CR
20.0458	ROCK	1	0.10	0.40	600M	T	HOH		DISK		F.1		WINFIELD CR
20.0466	OWL	1	0.10	0.40	600M	T	HOH		DISK		F.1		SPRUCE MTN
20.0476	SPLIT	1	0.10	0.50	600M	T	HOH		DISK		F.1		OWL MTN
20.0477	LINE	1	1.00	1.40	600M	T	HOH		DISK		F.1		OWL MTN
20.0481	SHELTER	1	0.60	0.90	600M	T	HOH		DISK		F.1		OWL MTN
20.0481	SHELTER	1	0.60	0.90	600M	L	HOH		DISK		YES		OWL MTN
20.0483	MATSON	1	0.10	0.40	600M	T	HOH		DISK		F.1		OWL MTN
20.0483	MATSON	1	0.10	0.40	600M	L	HOH		DISK		YES		OWL MTN
20.0484	CAMP	1	0.40	0.90	600M	T	HOH		DISK		F.1		OWL MTN
20.0484	CAMP	1	0.40	0.90	600M	L	HOH		DISK		YES		OWL MTN
20.0504	TWIN	1	0.30	0.60	600M	L	HOH		DISK		YES		OWL MTN
20.0509	509.0000	1	0.70	1.00	600M	T	HOH		DISK		F.1		OWL MTN
20.0509	509.0000	1	0.70	1.00	600M	L	HOH		DISK		YES		OWL MTN
20.0513	JACKSON	1	0.10	0.40	600M	T	HOH		DISK		F.1		OWL MTN
20.0513	JACKSON	1	0.10	0.40	600M	L	HOH		DISK		YES		OWL MTN
21.0235	COAL	1	0.10	0.40	600M	T	HOH		DISK		F.1		KLOOCHMAN ROCK
21.0235	COAL	1	0.10	0.40	600M	L	HOH		DISK		YES		KLOOCHMAN ROCK
21.0267	HARLOW	1	0.40	0.80	600M	T	HOH		DISK		F.1		KLOOCHMAN ROCK
21.0267	HARLOW	1	0.40	0.80	600M	L	HOH		DISK		YES		KLOOCHMAN ROCK

1992 AMBIENT MONITORING STREAM SEGMENTS

WRIA	STREAM NAME	SEG #	RM (LOW)	RM (UPR)	SEG LEN (M)	SURVEY TYPE	DATA AFFIL.	SUM RPT	DATA BASE	FILE ID	FIELD FORM	GIS	QUAD MAP
10.0122	GREENWATER	1	12.95	13.60	313	R,H,L	MUCKLE	NWIFC	AMONT2			YES	NOBLE KNOB
10.0122	GREENWATER	2	13.60	14.25	1112	R,H,L	MUCKLE	NWIFC	AMONT2			YES	NOBLE KNOB
10.0122	GREENWATER	3	14.25	15.46	793	R,H,L	MUCKLE	NWIFC	AMONT2			YES	NOBLE KNOB
10.0122	GREENWATER	4	15.46	16.50	619	R,H,L	MUCKLE	NWIFC	AMONT2			YES	NOBLE KNOB
10.0122	GREENWATER	5	17.00	18.25	2621	R,H,L	MUCKLE	NWIFC	AMONT2			YES	NOBLE KNOB
10.0122	GREENWATER	6	18.25	18.85	3614	R,H,L	MUCKLE	NWIFC	AMONT2			YES	NOBLE KNOB
13.0028	DESCHUTES	10	43.00	44.90	4698	R,H,L	SQUAXIN	NWIFC	AMONT2	CA	YES		BALD HILL, EATONVILLE
13.0028	DESCHUTES	12	41.30	42.40	1939	R,H,L	SQUAXIN	NWIFC	AMONT2	CB	YES		BALD HILL
13.0028	DESCHUTES	16				S	SQUAXIN		DISK				BALD HILL
13.0028	DESCHUTES	17				S	SQUAXIN		DISK				BALD HILL
13.0028	DESCHUTES	18	35.30	36.60	2615	R,H,L,S	SQUAXIN	NWIFC	AMONT2	CC	YES		BALD HILL, LAKE LAWRENCE
13.0028	DESCHUTES	19	33.30	35.30	3862	R,H,L,S	SQUAXIN	NWIFC	AMONT2	CD	YES		LAKE LAWRENCE
13.0028	DESCHUTES	20				S	SQUAXIN		DISK				LAKE LAWRENCE
13.0028	DESCHUTES	22				S	SQUAXIN		DISK				LAKE LAWRENCE,VAIL
13.0069	MITCHELL	1				S	SQUAXIN		DISK				BALD HILL
13.0086	HUCKLEBERRY	1				S	SQUAXIN		DISK				BALD HILL
13.0086	HUCKLEBERRY	2				S	SQUAXIN		DISK				BALD HILL
13.0089	JOHNSON	1				S	SQUAXIN		DISK				BALD HILL
13.0095	THURSTON	1				S	SQUAXIN		DISK				BALD HILL
13.0110	LITTLE DESCHUTES	1	0.00	0.80	1157	R,H,L	SQUAXIN	NWIFC	AMONT2	CE	YES		BALD HILL
15.0454	LITTLE TAHUYA	1	0.00	1.40	2155	R,H,L	PNPTC		DISK		YES	*	LAKE WOOTEN
15.0454	LITTLE TAHUYA	2	1.40	2.35	1500	R,H,L	PNPTC		DISK		YES	*	LAKE WOOTEN
15.0495	BIG MISSION	1	0.00	0.60	1000	R,H,L	PNPTC		DISK		YES	*	BELFAIR
15.0495	BIG MISSION	2	0.60	1.30	1400	R,H,L	PNPTC		DISK		YES	*	BELFAIR
15.0495	BIG MISSION	3	1.30	1.50	700	R,H,L	PNPTC		DISK		YES	*	BELFAIR
15.0495	BIG MISSION	4	1.50	1.70	600	R,H,L	PNPTC		DISK		YES	*	BELFAIR
15.0495	BIG MISSION	5	1.70	2.30	1076	R,H,L	PNPTC		DISK		YES	*	BELFAIR
15.0495	BIG MISSION	6	2.30	3.00	1885	R,H,L	PNPTC		DISK		YES	*	BELFAIR, LAKE WOOTEN
15.0495	BIG MISSION	7	3.00	4.10	1800	R,H,L	PNPTC		DISK		YES	*	BELFAIR, LAKE WOOTEN
15.0495	BIG MISSION	8	4.10	5.80	3000	R,H,L	PNPTC		DISK		YES	*	BELFAIR
15.0496	BIG MISSION TRIB.	1	0.00	0.80	1800	R,H	PNPTC		DISK		YES	*	BELFAIR
15.0498	BIG MISSION TRIB.	1	0.00	1.70	2700	R,H	PNPTC		DISK		YES	*	LAKE WOOTEN
15.0499	BIG MISSION TRIB.	1	0.00	0.20	340	R,H,L	PNPTC		DISK		YES	*	BELFAIR
15.0499	BIG MISSION TRIB.	2	0.20	0.90	1600	R,H,L	PNPTC		DISK		YES	*	BELFAIR
15.0500	BIG MISSION TRIB.	1	0.00	0.40	810	R,H	PNPTC		DISK		YES	*	BELFAIR
15.0505	COURTNEY	1	0.00	0.55	800	R,H,L	PNPTC		DISK		YES	*	BELFAIR
15.0505	COURTNEY	2	0.55	0.90	500	R,H,L	PNPTC		DISK		YES	*	BELFAIR
15.0505	COURTNEY	3	0.90	2.40	1500	R,H,L	PNPTC		DISK		YES	*	BELFAIR
15.0510	BEAR	1	0.00	0.20	385	R,H,L	PNPTC		DISK		YES	*	BELFAIR
15.0510	BEAR	2	0.20	0.50	662	R,H,L	PNPTC		DISK		YES	*	BELFAIR
15.0510	BEAR	3	0.50	1.65	1600	R,H,L	PNPTC		DISK		YES	*	BELFAIR, WILDCAT LAKE
17.0012	BIG QUILCENE R.	1	0.00	0.10			PNPTC		DISK			*	QUILCENE
17.0012	BIG QUILCENE R.	2	0.10	0.60			PNPTC		DISK			*	QUILCENE
17.0012	BIG QUILCENE R.	3	0.60	2.80			PNPTC		DISK			*	QUILCENE, MT. WALKER
17.0076	LITTLE QUILCENE R.	1	0.00	1.70	300	R,H,L	PNPTC		DISK		YES	*	QUILCENE, MT. WALKER
17.0076	LITTLE QUILCENE R.	2	1.70	1.90	2107	R,H,L	PNPTC		DISK		YES	*	MT. WALKER
17.0076	LITTLE QUILCENE R.	3	1.90	2.70	1300	R,H,L	PNPTC		DISK		YES	*	MT. WALKER
17.0076	LITTLE QUILCENE R.	4	2.70	4.40	2500	R,H,L	PNPTC		DISK		YES	*	MT. WALKER
17.0076	LITTLE QUILCENE R.	5	4.40	5.20	1387	R,H,L	PNPTC		DISK		YES	*	MT. WALKER
17.0090	HOWE	1	0.00	0.50	800	R,H,L	PNPTC		DISK		YES	*	MT WALKER, UNCAS
17.0245	SALMON	2	0.70	1.50			PNPTC		DISK			*	UNCAS
18.0160	MCDONALD	1	0.20	4.10	7100	R,H,L	PNPTC		DISK		YES	*	CARLSBORG
18.0160	MCDONALD	2	4.10	4.90	1800	R,H,L	PNPTC		DISK		YES	*	CARLSBORG
18.0160	MCDONALD	3	4.90	6.90	3465	R,H,L	PNPTC		DISK		YES	*	CARLSBORG
18.0173	SIEBERT	1	0.00	3.50	6264	R,H,L	PNPTC		DISK		YES	*	MORSE
18.0173	SIEBERT	2	3.50	6.40	5000	R,H,L	PNPTC		DISK		YES	*	MORSE
19.0020	WHISKEY	1	0.00	0.00	456	R,H,L	LELWHA	NWIFC	AMONT2	AA	YES	YES	DISQUE
19.0103	DEEP	1	0.10	2.60	4117	R,H,L	LELWHA	NWIFC	AMONT2	AB	YES		
49.0139	OMAK	1	0.00	1.50		R,H	COLVILLE		AMONT2	AI			
49.0139	OMAK	2	1.50	3.00	1779	R,H	COLVILLE	NWIFC	AMONT2	AE			
49.0139	OMAK	3	3.00	5.00	2249	R,H	COLVILLE	NWIFC	AMONT2	AF			
49.0139	OMAK	4	5.00	9.00	2319	R,H,L	COLVILLE	NWIFC	AMONT2	AG			
49.0139	OMAK	5	12.20	12.20	2147	R,H	COLVILLE	NWIFC	AMONT2	AH			

1991 TFW AMBIENT MONITORING STREAM SURVEYS

WRIA	STREAM NAME	SEG#	RM (LOW)	RM (UPR)	SEG LEN(M)	FILE ID	SURVEY TYPE	DATA AFFIL.	SUM RPT	DATA-BASE	FIELD FORMS	GIS	USGS TOPO QUAD MAP
03.0352	MUDDY	M11	1.00	2.10	1707.0	BF	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	HAMILTON
03.0359	ALDER	M11	1.50	2.40	1369.0	BD	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	HAMILTON
03.0359	ALDER	M21	0.70	1.50		BC		UWCSS	NWIFC	AMON91	YES	YES	HAMILTON
04.0786	ALL	M11	0.70	1.20	893.0	AT	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	PRAIRIE MTN.
04.0786	ALL	U31	1.20	1.50	427.0	AU	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	PRAIRIE MTN.
04.1148	CAMP	V11	0.00	0.70	1209.0	BG	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	PUGH MTN.
04.1148	CAMP	V12	1.90	2.70	1231.0	BL	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	PUGH MTN.
04.1148	CAMP	V41	0.70	1.50	1291.0	FC	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	PUGH MTN.
04.1148	CAMP	V42	1.50	1.90	639.0	BI	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	PUGH MTN.
04.1148	CAMP	V43	2.70	3.00	592.0	BK	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	PUGH MTN.
04.1157	PUMICE	M11			409.0	AV	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	LIME MTN.
04.1157	PUMICE	M21	0.30	1.00	1110.0	AW	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	LIME MTN.
04.1157	PUMICE	U41	1.00	1.60	995.0	AX	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	LIME MTN.
08.0368	M.F. TAYLOR	F31	3.00	3.70	1098.0	AE	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	EAGLE GORGE
08.0368	M.F. TAYLOR	F41	3.70	4.60	1440.0	AF	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	EAGLE GORGE
08.0369	S.F. TAYLOR	F41	0.00	0.70	1069.0	AH	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	EAGLE GORGE
09.0114	NEWAUKUM	V21			5228.4	FQ	R,H,L	MUCKLE	NWIFC	AMON91	YES		BLACK DIAMOND
09.0201	CHARLEY	H11	3.50	4.10	919.0	AB	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	CYCLONE CR.
09.0201	CHARLEY	V11	0.00	1.50	2391.0	AY	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	EAGLE GORGE, CYCLONE CR.
09.0201	CHARLEY	V12			1580.0	BA	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	CYCLONE CR.
09.0201	CHARLEY	V21	1.50	2.00	892.0	AZ	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	CYCLONE CR.
09.0201	CHARLEY	V22	2.00	3.00	828.0	BB	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	CYCLONE CR.
10.0550	IPSUT	H31			4141.2	FP	R,H,L	MUCKLE	NWIFC	AMON91	YES		MOWICH LAKE
14.0035	GOLDSBOROUGH	M11			6736.0	AP	R,H,L,M	CONS	CSS	AMON91	YES	YES	SHELTON, SHELTON VALLEY
15.0209	ROSS	U11			2972.8	DL	R,H,L,M		NWIFC	AMON91	NO		BREMERTON WEST
15.0389	BIG BEEF	M21	0.00	1.80	2868.0	BS	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	SEABECK
17.0034	S.F. TUNNEL	V41	1.50	2.40	714.0	AA	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	MT. TOWNSEND
17.0219	SNOW	F41	0.60	3.80	441.2	CQ	R,H,L,M	UWCSS	NWIFC	AMON91	YES		UNCAS
17.0219	SNOW	F3.1	3.80	4.40	6254.2	AG	R,H,L,M	UWCSS	NWIFC	AMON91	YES		UNCAS
17.0219	SNOW	V41	4.40	4.80	953.3	CR	R,H,L,M	UWCSS	NWIFC	AMON91	YES		UNCAS
20.0122	FLUHARTY	F51			2762.6	BN	R,H,L,M	QUILEUT	NWIFC	AMON91	YES	YES	GUNDERSON MTN.
20.0145	M.F. DICKEY	M12			514.3	AD	R,H,L,M	QUILEUT	NWIFC	AMON91	YES		GUNDERSON MTN.
20.0146	SPIDDLE	M11			2020.6	BH	R,H,L,M	QUILEUT	NWIFC	AMON91	YES		GUNDERSON MTN.
20.0462	MAPLE	F41	3.50	4.10	5751.0	CE	R,H,L,M	HOH	CSS	AMON91	YES	YES	SPRUCE MTN.
20.0462	MAPLE	M11	2.50	3.50	1418.0	CG	R,H,L,M	HOH	CSS	AMON91	YES	YES	SPRUCE MTN.
20.0462	MAPLE	V31	0.30	2.50	1653.0	CF	R,H,L,M	HOH	CSS	AMON91	YES	YES	SPRUCE MTN.
20.0466	OWL	M11	0.00	1.30	3171.0	CL	R,H,L,M	HOH	CSS	AMON91	YES	YES	SPRUCE MTN.
20.0466	OWL	V11	1.30	2.80	4400.0	CM	R,H,L,M	HOH	CSS	AMON91	YES	YES	SPRUCE MTN.
20.0484	CAMP	F41	0.00	0.80	718.0	BY	R,H,L,M	HOH	CSS	AMON91	YES	YES	OWL MTN.
20.0484	CAMP	V21			345.0	CC	R,H,L,M	HOH	CSS	AMON91	YES	YES	OWL MTN.
20.0484	CAMP	V31	0.80	1.50	1681.0	CN	R,H,L,M	HOH	CSS	AMON91	YES	YES	OWL MTN.
20.0506	WEST TWIN	F41	0.70	1.20	1924.0	CH	R,H,L,M	HOH	CSS	AMON91	YES	YES	OWL MTN. , SPRUCE MTN.
20.0513	JACKSON	F41	0.00	0.80	450.0	CK	R,H,L,M		CSS	AMON91	NO	YES	OWL MTN.
20.0513	JACKSON	V31	0.80	1.50	1318.0	CJ	R,H,L,M		CSS	AMON91	NO	YES	OWL MTN.
20.0530A	UNNAMED	F41	0.00	1.20	1893.0	AC	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	MT. TOM
21.0240	TSHLETSHY	F41			1397.5	CP	R,H,L,M	QUINAUL	NWIFC	AMON91	YES		BOB CREEK
21.0462	WILLABY	M11	0.00	0.10	649.0	BX	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	LAKE QUINAULT EAST
21.0462	WILLABY	M12	0.20	0.50	507.0	BV	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	LAKE QUINAULT EAST
21.0462	WILLABY	M13	1.20	1.70	917.0	BU	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	LAKE QUINAULT EAST
21.0462	WILLABY	M21	0.10	0.20	260.0	BR	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	LAKE QUINAULT EAST
21.0462	WILLABY	M22	0.50	1.20	1076.0	BT	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	LAKE QUINAULT EAST
21.0462	WILLABY	V21	1.70	2.00	360.0	BW	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	LAKE QUINAULT EAST
21.0469	ZIEGLER	U11	3.10	4.10	1550.0	BQ	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	LAKE QUINAULT EAST
21.0469	ZIEGLER	V21	2.80	3.10	493.0	BP	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	LAKE QUINAULT EAST
23.0288	HELM	M21			6309.0	CO	R,H,L,M	QUINAUL	NWIFC	AMON91	YES		
24.0272	S.F. WILLAPA	M21			3044.6	AI	R,H,M		NWIFC	AMON91	YES		
24.0439	CANYON	F41			1716.8	AR	R,H,M		NWIFC	AMON91	YES	YES	NORTH NEMAH
24.0439	CANYON	V41			971.5	AS	R,H,M		NWIFC	AMON91	YES	YES	NORTH NEMAH
24.0441	UNNAMED	M11			1307.0	AQ	R,H,M		NWIFC	AMON91	YES		
39.1104	N.F. TANEUM	V12	7.80	8.50	2240.0	CB	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	RONALD
39.1104	N.F. TANEUM	V43	7.50	7.80	3102.0	CD	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	RONALD, QUARTZ MTN.
39.1378	W.F. TEANAWAY	V11	9.20	9.90	902.0	AK	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	CLE ELUM LAKE
39.1378	W.F. TEANAWAY	V31	8.80	9.20	588.0	AJ	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	CLE ELUM LAKE
39.1378	W.F. TEANAWAY	V32	10.80	11.10	255.0	AM	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	CLE ELUM LAKE

WRIA	STREAM NAME	SEG#	RM (LOW)	RM (UPR)	SEG LEN(M)	FILE ID	SURVEY TYPE	DATA AFFIL.	SUM RPT	DATA-BASE	FIELD FORMS	GIS	USGS TOPO QUAD MAP
39.1378	W.F. TEANAWAY	V41	8.00	8.80	1481.0	CA	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	CLE ELUM LAKE
39.1378	W.F. TEANAWAY	V42	9.90	10.80	803.0	AL	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	CLE ELUM LAKE
39.1378	W.F. TEANAWAY	V43	11.10	11.60	842.0	AN	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	CLE ELUM LAKE
45.9999	MISSION	V41	0.00	2.50	4224.0	AO	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	SWAUK PASS, TIPTOP, MONITOR
46.0125	MAD	U11	14.00	16.00	1152.0	BO	R,H,L,M	UWCSS	CSS	AMON91	YES	YES	SUGAR LOAF PK., SILVER FALLS
52.0015	IRON	F41			1189.0	DX	R,H,L,M	COLVILLE	CSS	AMON91	YES		
52.0015	IRON	U11			3865.0	DT	R,H,L,M	COLVILLE	CSS	AMON91	YES		
52.0025	BRIDGE	F21			2928.2	DI	R,H,L,M	COLVILLE	NWIFC	AMON91	YES		
52.0025	BRIDGE	F41			1226.2	DO	R,H,L,M	COLVILLE	NWIFC	AMON91	YES		
52.0025	BRIDGE	U21			3161.0	DM	R,H,L,M	COLVILLE	CSS	AMON91	YES		
52.0025	BRIDGE	V11			3817.0	DJ	R,H,L,M	COLVILLE	CSS	AMON91	YES		
52.0025	BRIDGE	V31			1762.0	DD	R,H,L,M	COLVILLE	CSS	AMON91	YES		
52.0038	TWENTY-FIVE MILE	V21			146.3	DB	R,H,L,M	COLVILLE	NWIFC	AMON91	YES		
52.0040	TWENTY-THREE MILE	U41			1003.0	DU	R,H,L,M	COLVILLE	CSS	AMON91	YES		
58.0029	THIRTY MILE	F31			5219.1	FD	R,H,L,M	COLVILLE	NWIFC	AMON91	YES		
58.0029	THIRTY MILE	F41			2405.5	FE	R,H,L,M	COLVILLE	NWIFC	AMON91	YES		
58.0029	THIRTY MILE	U21			18038.0	FF	R,H,L,M	COLVILLE	NWIFC	AMON91	YES		
58.0029	THIRTY MILE	V11			7065.5	FG	R,H,L,M	COLVILLE	NWIFC	AMON91	YES		
58.0040	N.F. NANAMKIN	F41			2978.0	FH	R,H	COLVILLE	NWIFC	AMON91	YES		
58.0040	N.F. NANAMKIN	U21			12477.0	FI	R,H,L,M	COLVILLE	NWIFC	AMON91	YES		
58.0040	N.F. NANAMKIN	U22				FJ	R	COLVILLE	NWIFC	AMON91	YES		
58.0070	LYNX	F31			5197.0	FK	R,H,L	COLVILLE	NWIFC	AMON91	YES		
58.0133	ORAPAKEN	U21			1857.0	DS	R,H,L,M	COLVILLE	CSS	AMON91	YES		
58.0143	ALDER	U11				FL	R	COLVILLE	NWIFC	AMON91	YES		
58.0143	ALDER	V11			2906.0	DR	R,H,L,M	COLVILLE	CSS	AMON91	YES		
58.0356	HALL	M21			11220.0	DG	R,H,L,M	COLVILLE	CSS	AMON91	YES		
58.0356	HALL	U11			5038.0	DB	R,H,L,M	COLVILLE	CSS	AMON91	YES		
58.0356	HALL	U31			4913.0	DV	R,H,L,M	COLVILLE	CSS	AMON91	YES		
58.0356	HALL	V11			1429.0	DH	R,H,L,M	COLVILLE	CSS	AMON91	YES		
58.0356	HALL	V21			7117.0	DC	R,H,L,M	COLVILLE	CSS	AMON91	YES		
58.0356B	SITDOWN	U21			2013.0	DN	R,H,L,M	COLVILLE	CSS	AMON91	YES		
59.0516	BLUE	F51			3128.0	DK	R,H,L,M	COLVILLE	CSS	AMON91	YES		
59.0516	BLUE	M11			3184.0	DF	R,H,L,M	COLVILLE	CSS	AMON91	YES		
59.0516	BLUE	U21			3355.0	DE	R,H,L,M	COLVILLE	CSS	AMON91	YES		
61.0124	ONION	F31			5675.0	FM	R,H,L	COLVILLE	NWIFC	AMON91	YES		
61.0124	ONION	V21			1050.0	FN	R,H	COLVILLE	NWIFC	AMON91	YES		
61.0151	SHEEP	F51			1103.0	CI	R,H,L,M	COLVILLE	CSS	AMON91	YES		
61.0151	SHEEP	V11			1856.0	DA	R,H,L,M	COLVILLE	CSS	AMON91	YES		
61.0198	DEEP	F41			583.0	DW	R,H,L,M	COLVILLE	CSS	AMON91	YES		
61.0198	DEEP	M11			884.0	DP	R,H,L,M	COLVILLE	CSS	AMON91	YES		
	TWENTY -ONE MILE	F41			1492.0	FO	R,H	COLVILLE	NWIFC	AMON91	YES		
	TWENTY -ONE MILE	V11			888.2	CX	R,H,L	COLVILLE	NWIFC	AMON91	YES		
	ALDER	V12			2917.8	EL	R,H,L		NWIFC	AMON91			
	ALDER	V41			961.3	EM	R,H,L		NWIFC	AMON91			
	ALDER	V42			7534.5	EJ	R,H,L		NWIFC	AMON91			
	BENEWAH	F41			454.8	CW	R,H,L			AMON91			
	BENEWAH	F41			7914.7	CV	R,H,L			AMON91			
	BENEWAH	F42			4369.0	ET	R,H,L			AMON91			
	BENEWAH	M11			1871.5	CT	R,H,L			AMON91			
	BENEWAH	M21			1904.2	CS	R,H,L			AMON91			
	BENEWAH	M22			3546.4	CU	R,H,L,M			AMON91			
	BOZARD	M21			3041.6	EQ	R,H			AMON91			
	EVANS	F21			1808.3	EU	R,H,L,M			AMON91			
	EVANS	M21			832.1	EV	R,H,L			AMON91			
	EVANS	M22			343.8	EY	R,H,L			AMON91			
	EVANS	U21			1182.4	EW	R,H,L			AMON91			
	EVANS	V21			1676.7	EX	R,H,L			AMON91			
	LAKE	M11			4171.8	EO	R,H,L			AMON91			
	LAKE	M21			5074.6	EP	R,H,L			AMON91			
	LAKE	V11			2735.9	EN	R,H,L			AMON91			
	LAKE	V41			1450.8	EK	R,H,L			AMON91			
	N.F. ALDER	F31				EZ	R,H			AMON91			
	WEST LAKE	M11			1424.9	ES	R,H,L			AMON91			
	WEST LAKE	M21			2975.5	ER	R,H,L			AMON91			

1990 TFW AMBIENT MONITORING STREAM SURVEYS

WRIA	STREAM NAME	SEG	RM (LOW)	RM (UPR)	SEG LEN (M)	SURVEY TYPE	DATA AFFIL.	SUM RPT	DATA-BASE	FILE ID	FIELD FORM	GIS	USGS TOPO QUAD MAP
10.0253	HUCKLEBERRY	V1-1				R,H	MUCKLE		AMON90	FR	YES		
11.0067	TANWAX	F31	0.00	2.70	6103.0	R,H,L,M	NWIFC	CSS	AMON90	AA	YES	YES	BALD HILL, HARTS LAKE
11.0067	TANWAX	M21	2.70	4.70	1605.0	R,H,L,M	NWIFC	CSS	AMON90	AB	YES	YES	HARTS LAKE
11.0101	MASHEL	V11	14.40	16.40	4456.0	R,H,L,M	NWIFC	CSS	AMON90	BY	YES	YES	ASHFORD
11.0110	MASHEL RB TR	V11			205.0	R,H,L		CSS	AMON90	DX	NO		
11.0110.	MASHEL RB TR	V41			930.0	R,H,L,M		CSS	AMON90	DW	NO		
11.0114	BUSYWILD	V11			1061.0	M		CSS	AMON90	DY	NO		
13.0028	DESCHUTES	F21	38.10	40.90	4042.0	R,H,L,M	SQUAXIN	CSS	AMON90	CW	YES	YES	BALD HILL
13.0028	DESCHUTES	F31	36.50	38.10	3023.0	R,H,L,M	SQUAXIN	CSS	AMON90	BG	YES	YES	BALD HILL
13.0057	FALL	F41	0.00	0.40	581.0	R,H,L,M	SQUAXIN	CSS	AMON90	CU	YES	YES	LAKE LAWRENCE
13.0086	HUCKLEBERRY	M11	0.00	0.70	1099.0	R,H,L,M	SQUAXIN	CSS	AMON90	BA	YES	YES	BALD HILL
13.0086	HUCKLEBERRY	M12	1.30	2.00	1031.0	R,H,L,M	SQUAXIN	CSS	AMON90	BD	YES	YES	BALD HILL
13.0086	HUCKLEBERRY	V11	0.70	1.00	516.0	R,H,L,M	SQUAXIN	CSS	AMON90	BB	YES	YES	BALD HILL
13.0086	HUCKLEBERRY	V12	2.00	2.50	870.0	R,H,L,M	SQUAXIN	CSS	AMON90	BE	YES	YES	BALD HILL
13.0086	HUCKLEBERRY	V13	2.50	2.70	314.0	R,H,L,M	SQUAXIN	CSS	AMON90	BF	YES	YES	BALD HILL
13.0086	HUCKLEBERRY	V31	1.00	1.30	497.0	R,H,L,M	SQUAXIN	CSS	AMON90	BC	YES	YES	BALD HILL
13.0089	JOHNSON	M11	0.00	0.50	1192.0	R,H,L,M	SQUAXIN	CSS	AMON90	CV	YES	YES	BALD HILL
13.0095	THURSTON	M11	0.00	0.60	783.0	R,H,L,M	SQUAXIN	CSS	AMON90	CX	YES	YES	BALD HILL
13.0095	THURSTON	V21	0.60	1.10	1195.0	R,H,L,M	SQUAXIN	CSS	AMON90	CY	YES	YES	BALD HILL
13.0123	LINCOLN	M21	0.00	1.90	3143.0	R,H,L,M	SQUAXIN	CSS	AMON90	BX	YES	YES	EATONVILLE, NEWAUKUM L., THE ROCKIES
13.0124	LEWIS	V11	0.00	1.30	860.0	R,H,L,M	SQUAXIN	CSS	AMON90	AX	YES	YES	THE ROCKIES
13.0125	BUCK	V21	0.00	0.50	715.0	R,H,L,M	SQUAXIN	CSS	AMON90	AZ	YES	YES	THE ROCKIES
13.0128	WARE	V21	0.00	0.50	712.0	R,H,L,M	SQUAXIN	CSS	AMON90	AY	YES	YES	THE ROCKIES, NEWAUKUM LAKE
13.0138	MCLANE	F31	0.00	1.50	2448.0	R,H,L,M	SQUAXIN	CSS	AMON90	BJ	YES	YES	SUMMIT LAKE, TUMWATER
13.0138	MCLANE	H21	4.20	4.60	1531.0	R,H,L,M	SQUAXIN	CSS	AMON90	BK	YES	YES	SUMMIT LAKE, LITTLEROCK
13.0138	MCLANE	M11	2.90	4.20	1599.0	R,H,L,M	SQUAXIN	CSS	AMON90	BL	YES	YES	LITTLEROCK
13.0138	MCLANE	M21	1.50	2.90	2171.0	R,H,L,M	SQUAXIN	CSS	AMON90	BI	YES	YES	SUMMIT LAKE

1990 TFW AMBIENT MONITORING STREAM SURVEYS

WRIA	STREAM NAME	SEG	RM (LOW)	RM (UPR)	SEG LEN (M)	SURVEY TYPE	DATA AFFIL.	SUM RPT	DATA-BASE	FILE ID	FIELD FORM	GIS	USGS TOPO QUAD MAP
22.0079	BRITTAIN	M11	0.70	1.30	764.0	R,H,L,M	ITT-RAY	CSS	AMON90	AD	YES	YES	HUMPTULIPS
22.0079	BRITTAIN	M12	1.80	2.50	4241.0	R,H,L,M	ITT-RAY	CSS	AMON90	AF	YES	YES	HUMPTULIPS
22.0079	BRITTAIN	V31	0.00	0.70	1300.0	R,H,L,M	ITT-RAY	CSS	AMON90	AC	YES	YES	HUMPTULIPS
22.0079a	ELWOOD	V11	1.80	2.70	2637.0	R,H,L,M	ITT-RAY	CSS	AMON90	BH	YES	YES	HUMPTULIPS
22.0400	UNNAMED	F51	0.00	0.50	698.0	R,H,L,M	QUINAUL	CSS	AMON90	BM	YES	YES	GRISDALE
22.0400	UNNAMED	M21	0.50	1.50	1532.0	R,H,L,M	QUINAUL	CSS	AMON90	BN	YES	YES	GRISDALE
39.1081	TANEUM MAIN	F31			2277.0	R,H,L,M		CSS	AMON90	DP	NO	YES	TANEUM CANYON, THORP
39.1081	TANEUM MAIN	M21			8194.0	R,H,L,M		CSS	AMON90	DQ	NO		
39.1081	TANEUM MAIN	V41			3238.0	R,H,L,M		CSS	AMON90	DR	NO	YES	TANEUM CANYON
39.1081	TANEUM MAIN	V42			2596.0	R,H,L,M		CSS	AMON90	DT	NO		
39.1104	NF TANEUM	U11			1361.0	R,H,L,M	NWIFC	CSS	AMON90	BQ	YES	YES	FROST MTN.
39.1104	NF TANEUM	U12			1657.0	R,H,L,M	NWIFC	CSS	AMON90	AS	YES	YES	QUARTZ MTN., MOUNT CLIFTY
39.1104	NF TANEUM	U21	8.50	9.10	932.0	R,H,L,M	NWIFC	CSS	AMON90	AP	YES	YES	QUARTZ MTN.
39.1104	NF TANEUM	U22	9.10	10.60	2209.0	R,H,L,M	NWIFC	CSS	AMON90	AQ	YES	YES	QUARTZ MTN.
39.1104	NF TANEUM	U23	10.60	11.40	1415.0	R,H,L,M	NWIFC	CSS	AMON90	AR	YES	YES	QUARTZ MTN.
39.1104	NF TANEUM	V11	2.00	2.50	1073.0	R,H,L,M	NWIFC	CSS	AMON90	BS	YES	YES	FROST MTN.
39.1104	NF TANEUM	V13	4.20	5.50	1769.0	R,H,L	NWIFC	CSS	AMON90	BV	YES	YES	QUARTZ MTN.
39.1104	NF TANEUM	V41	0.80	2.00	1923.0	R,H,L,M	NWIFC	CSS	AMON90	BR	YES	YES	FROST MTN.
39.1104	NF TANEUM	V42	2.50	4.20	3389.0	R,H,L,M	NWIFC	CSS	AMON90	BT	YES	YES	RONALD, FROST MTN. CLE ELUM
39.1104	NF TANEUM	V44	5.50	7.50	768.0	R,H,L,M	NWIFC	CSS	AMON90	BU	YES	YES	RONALD, QUARTZ MTN.
51.0046	NORTH STAR	V12	8.00	8.40	557.0	R,H,L,M		CSS	AMON90	AG	YES		
51.0046	NORTH STAR	V13	8.60	8.80	253.0	R,H,L,M		CSS	AMON90	AI	YES		
51.0046	NORTH STAR	V14	9.00	9.20	381.0	R,H,L,M		CSS	AMON90	AK	YES		
51.0046	NORTH STAR	V15	9.40	9.50	385.0	R,H,L,M		CSS	AMON90	AM	YES		
51.0046	NORTH STAR	V22	8.80	9.00	214.0	R,H,L,M		CSS	AMON90	AJ	YES		
51.0046	NORTH STAR	V23	9.50	9.70	706.0	R,H,L,M		CSS	AMON90	AN	YES		
51.0046	NORTH STAR	V43	8.40	8.60	614.0	R,H,L,M		CSS	AMON90	AH	YES		
51.0046	NORTH STAR	V44	9.20	9.40	439.0	R,H,L,M		CSS	AMON90	AL	YES		
51.0046a	UN NAMED TRIB	V11	0.00	4.00	616.0	R,H,L,M		CSS	AMON90	AO	YES		
52.0021a	LOUIE	F41			2431.0	R,H,L,M	COLVILLE	CSS	AMON90	DE	YES		
52.0021a	LOUIE	U31			2108.0	R,H,L,M	COLVILLE	CSS	AMON90	DD	YES		
52.0031a	S.F. NANAMPKIN	F31			2464.0	R,H,L,M	COLVILLE	CSS	AMON90	DL	YES		
52.0031a	S.F. NANAMPKIN	M11			2878.0	R,H,L,M	COLVILLE	CSS	AMON90	DK	YES		
52.0031a	S.F. NANAMPKIN	V11			9550.0	R,H,L,M	COLVILLE	CSS	AMON90	DM	YES		
52.0042a	GOLD	F41			5158.0	R,H,L,M	COLVILLE	CSS	AMON90	DI	YES		
52.0042a	GOLD	V41			2094.0	R,H,L,M	COLVILLE	CSS	AMON90	DJ	YES		
52.0042a	WEST FORK GOLD	U31			7537.0	R,H,L,M	COLVILLE	CSS	AMON90	DG	YES		
52.0042a	WEST FORK GOLD	U41			1070.0	R,H,L,M	COLVILLE	CSS	AMON90	DF	YES		
58.0170	HUNTERS	F31			8280.0	R,H,L,M	SPOKAN	CSS	AMON90	DN	YES		
58.0170	HUNTERS	F41			7041.0	R,H,L,M	SPOKAN	CSS	AMON90	DJ	YES		
58.0170	HUNTERS	V11			241.0	R,H,L,M	SPOKAN	CSS	AMON90	DO	YES		

1989 TFW AMBIENT MONITORING STREAM SURVEYS

WRIA	STREAM NAME	OLD SEG	NEW SEG	RM (LOW)	RM (UPR)	SEG LEN (M)	SURVEY TYPE	DATA AFFIL.	SUM RPT	FIELD FORMS	GIS	USGS TOPO QUAD MAP
01.0264	HUTCHINSON	B21	F30	0.00	0.60	1071.0	R,H,L,M	NWIFC	CSS	YES	YES	ACME
01.0264	HUTCHINSON	C41	M20	0.60	0.80	263.0	R,H,L,M	LUMMI	CSS	YES	YES	ACME
01.0264	HUTCHINSON	E11	V10	0.80	1.00	807.0	R,H,L,M	LUMMI	CSS	YES	YES	ACME
01.0264	HUTCHINSON	E21	V20	1.00	1.60	305.0	R,H,L,M	LUMMI	CSS	YES	YES	ACME
01.0264	HUTCHINSON	E31	V40	1.60	2.60	1667.0	R,H,L,M	NWIFC	CSS	YES	YES	ACME
01.0464	CORNELL	B21	F30	0.00	0.30	592.0	R,H,L,M	NWIFC	CSS	YES	YES	GLACIER
01.0464	CORNELL	B31	F40	0.30	1.20	1517.0	R,H,L,M	NWIFC	CSS	YES	YES	GLACIER
01.0465	W. CORNELL	D21	U30	1.20	1.80	2107.0	R,H,L,M	LUMMI	CSS	YES	YES	GLACIER
01.0465	W. CORNELL	E21	V20	1.80	2.20	1114.9	R,H,L,M	NWIFC	CSS	YES	YES	GLACIER, GROAT MTN.
04.0384	SAVAGE	B31	F40	1.00	2.20	2093.0	R,H,L,M	NWIFC	CSS	YES	YES	GRANDY LAKE
04.0384	SAVAGE	G31	H30	4.10	4.70	971.0	R,H,L,M	NWIFC	CSS	YES	YES	GEE POINT
04.0384	SAVAGE	E11	V10	2.20	3.50	1780.0	R,H,L,M	NWIFC	CSS	YES	YES	GRANDY LAKE
04.0384	SAVAGE	E21	V20	3.50	4.10	1007.0	R,H,L,M	NWIFC	CSS	YES	YES	GRANDY LAKE, GEE POINT
09.0201	CHARLEY	C21	M10	0.10	0.60	761.0	R,H,L,M	MUCKLE	CSS	YES	YES	EAGLE GORGE
09.0201	CHARLEY	E10	V10	0.60	1.30	1086.0	R,H,L,M	MUCKLE	CSS	YES	YES	EAGLE GORGE, CYCLONE CR.
09.0201	CHARLEY	E12	V12	2.50	2.80	609.0	R,H,L,M	MUCKLE	CSS	YES	YES	CYCLONE CREEK
09.0201	CHARLEY	E11	V11	1.30	2.50	2003.0	R,H,L,M	MUCKLE	CSS	YES	YES	CYCLONE CREEK
09.0201	CHARLEY	E13	V13	2.80	3.40	581.0	R,H,L,M	MUCKLE	CSS	YES	YES	CYCLONE CREEK
09.02??	CHARLEY TRIB.	E11	V10	0.40	0.60	339.0	R,H,L,M	NWIFC	CSS	YES	YES	EAGLE GORGE, CYCLONE CR.
09.02??	CHARLEY TRIB.	G31	H31	0.00	0.40	614.0	R,H,L,M	NWIFC	CSS	YES	YES	CYCLONE CREEK
09.0206	CHARLEY TRIB.	E21	V21	0.00	0.50	920.0	R,H,L,M	NWIFC	CSS	YES	YES	CYCLONE CREEK
09.0206	CHARLEY TRIB.	G21	H21	0.50	1.10	1624.0	R,H,L,M	NWIFC	CSS	YES	YES	CYCLONE CREEK
09.0207	CHARLEY TRIB.	G21	H21	0.00	0.48	782.0	R,H,L,M	NWIFC	CSS	YES	YES	CYCLONE CREEK
09.0222	CANTON	E21	V20	0.00	1.20	1777.0	R,H,L,M	MUCKLE	CSS	YES	YES	GREENWATER
09.0222	CANTON	G21	H20	1.20	2.70	2641.0	R,H,L,M	MUCKLE	CSS	YES	YES	GREENWATER
10.0122	GREENWATER	E21	V20	9.70	11.30	10937.0	R,H,L,M	MUCKLE	CSS	YES	YES	NOBLE KNOB
10.0122	GREENWATER	E31	V40	8.40	9.70	2340.0	R,H,L,M	MUCKLE	CSS	YES	YES	NOBLE KNOB, SUN TOP
13.0028	DESCHUTES	E11	V10	48.00	51.00	5037.0	R,H,L,M	SQUAXIN	CSS	YES	YES	NEWAUKUM LAKE
13.0069	MITCHELL	E11	V11	1.50	2.30	893.0	R,H,L,M	NWIFC	CSS	YES	YES	BALD HILL
13.0069	MITCHELL	E12	V12	2.70	3.50	717.0	R,H,L,M	NWIFC	CSS	YES	YES	BALD HILL
13.0069	MITCHELL	E21	V21	2.30	2.70	303.0	R,H,L,M	NWIFC	CSS	YES	YES	BALD HILL
13.0069	MITCHELL	E31	V41	0.00	1.50	1588.0	R,H,L,M	NWIFC	CSS	YES	YES	BALD HILL
13.0072	MITCHELL TRIB.	E21	V21	0.00	0.10	126.0	R,H,L,M	NWIFC	CSS	YES	YES	BALD HILL
13.0072	MITCHELL TRIB.	E22	V22	1.00	?	312.0	R,H,L,M	NWIFC	CSS	YES	YES	BALD HILL
13.0072	MITCHELL TRIB.	E31	V41	0.10	1.00	1449.0	R,H,L,M	NWIFC	CSS	YES	YES	BALD HILL
13.0073	MITCHELL TRIB.	E31	V41	0.00	0.40	493.0	R,H,L,M	NWIFC	CSS	YES	YES	BALD HILL
13.0073	MITCHELL TRIB.	E21	V21	0.40	0.90	1135.0	R,H,L,M	NWIFC	CSS	YES	YES	BALD HILL
13.0073	MITCHELL TRIB.	G21	H21	0.90	1.10	335.0	R,H,L,M	NWIFC	CSS	YES	YES	BALD HILL
13.0073	MITCHELL TRIB.	G31	H31	1.10	1.20	138.0	R,H,L,M	NWIFC	CSS	YES	YES	BALD HILL
13.0126	W. F. DESCHUTES	E11	V10	0.00	2.00	3629.0	R,H,L,M	SQUAXIN	CSS	YES	YES	NEWAUKUM LAKE
13.0129	HARD	E21	V20	0.00	0.50	869.0	R,H,L,M	SQUAXIN	CSS	YES	YES	NEWAUKUM LAKE
13.0130	MINE	E11	V10	0.00	0.50	423.3	R,H,L,M	SQUAXIN	CSS	YES	YES	NEWAUKUM LAKE
13.0130	MINE	E21	V20	0.50	0.80	644.0	R,H,L,M	SQUAXIN	CSS	YES	YES	NEWAUKUM LAKE
14.0012	KENNEDY	B21	F30	0.30	0.70	938.0	R,H,L,M	SQUAXIN	CSS	YES	YES	SUMMIT LAKE
14.0012	KENNEDY	C21	M10	1.50	2.10	1701.0	R,H,L,M	SQUAXIN	CSS	YES	YES	SUMMIT LAKE
14.0012	KENNEDY	C41	M20	0.70	1.50	2123.0	R,H,L,M	SQUAXIN	CSS	YES	YES	SUMMIT LAKE
14.0012	KENNEDY	E11	V10	2.10	2.30	609.0	R,H,L,M	SQUAXIN	CSS	YES	YES	SUMMIT LAKE
15.0203	BLACKJACK			0.00	2.70		R,H,L,M				YES	BREMERTON WEST
15.0400	SEABECK	C21	M10	0.30	1.30	2361.0	R,H,L,M	NWIFC	CSS	YES	YES	SEABECK, WILDCAT LAKE
15.0420	DEWATTO	C41	M21	0.00	1.80	3428.0	R,H,L,M	NWIFC	CSS	YES	YES	LILLIWAUP
15.0420	DEWATTO	C42	M22	1.80	2.20	1389.0	R,H,L,M	NWIFC	CSS	YES	YES	LILLIWAUP
15.0420	DEWATTO	C43	M23	2.20	3.20	783.0	R,H,L,M	NWIFC	CSS	YES	YES	LILLIWAUP
19.0113	PYSHT	B21	F30	1.00	8.60	2832.0	R,H,L,M	NWIFC	CSS	YES	YES	PYSHT, WEST OF PYSHT
19.0113	PYSHT	E31	V40	8.60	12.00	5254.0	R,H,L,M	NWIFC	CSS	YES	YES	WEST OF PYSHT
19.0115	S.F. PYSHT	C21	M10	2.00	3.40	2330.0	R,H,L,M	NWIFC	CSS	YES	YES	WEST OF PYSHT
19.0115	S.F. PYSHT	C41	M20	0.00	2.00	3164.0	R,H,L,M	NWIFC	CSS	YES	YES	WEST OF PYSHT
19.0115	S.F. PYSHT	D11	U20	3.40	5.20	2871.0	R,H,L,M	NWIFC	CSS	YES	YES	PYSHT, WEST OF PYSHT
19.0120	GREEN	C41	M20	0.00	1.40	3075.0	R,H,L,M	NWIFC	CSS	YES	YES	WEST OF PYSHT
19.0120	GREEN	E11	V10	1.40	2.70	2330.0	R,H,L,M	NWIFC	CSS	YES	YES	WEST OF PYSHT
19.0120	GREEN	E21	V20	2.70	2.90	256.0	R,H,L,M	NWIFC	CSS	YES	YES	WEST OF PYSHT
20.0442	WINFIELD	C21	M10	0.00	3.20	6043.0	R,H,L,M	HOH	CSS	YES	YES	WINFIELD CREEK
20.0447	ELK	B21	F30	0.00	1.10	1599.0	R,H,L,M	NWIFC	CSS	YES	YES	WINFIELD CREEK
20.0447	ELK	B31	F40	1.10	1.70	948.0	R,H,L,M	NWIFC	CSS	YES	YES	WINFIELD CREEK
20.0447	ELK	C21	M10	1.70	2.60	1446.0	R,H,L,M	NWIFC	CSS	YES	YES	WINFIELD CREEK

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1989 TFW AMBIENT MONITORING STREAM SURVEYS

WRIA	STREAM NAME	OLD SEG	NEW SEG	RM (LOW)	RM (UPR)	SEG LEN (M)	SURVEY TYPE	DATA AFFIL.	SUM RPT	FIELD FORMS	GIS	USGS TOPO QUAD MAP
20.0448	ALDER	C11	F50	1.80	2.60	791.0	R,H,L,M	HOH	CSS	YES	YES	WINFIELD CREEK
20.0448	ALDER	C21	M10	0.70	1.80	1809.0	R,H,L,M	HOH	CSS	YES	YES	WINFIELD CREEK
20.0451	WILLOUGHBY	C21	M10	0.00	0.30	762.0	R,H,L,M	HOH	CSS	YES	YES	WINFIELD CREEK
20.0451	WILLOUGHBY	E11	V10	0.30	1.40	1689.0	R,H,L,M	HOH	CSS	YES	YES	WINFIELD CREEK
20.0452	W.F. WILLOUGHBY	E11	V10	0.00	0.70	1077.0	R,H,L,M	HOH	CSS	YES	YES	WINFIELD CREEK
20.0504	TWIN	C21	M10	0.00	1.20	1588.0	R,H,L,M	HOH	CSS	YES	YES	OWL MTN., SPRUCE MTN.
20.0505	EAST TWIN	C11	F50	0.00	0.70	764.0	R,H,L,M	HOH	CSS	YES	YES	OWL MOUNTAIN
21.0025	HURST	B21	F30	0.00	2.00	6128.0	R,H,L,M	QUINAUL	CSS	YES	YES	QUEETS
21.0065	CHRISTMAS	C21	M10	0.50	2.70	4391.0	R,H,L,M	NWIFC	CSS	YES	YES	CHRISTMAS CREEK
21.0065	CHRISTMAS	C41	M20	2.70	3.30	1409.0	R,H,L,M	NWIFC	CSS	YES	YES	CHRISTMAS CREEK
39.1128	S.F. TANEUM	E11	V11	1.70	2.10	1389.0	R,H,L,M	NWIFC	CSS	YES	YES	FROST MTN.
39.1128	S.F. TANEUM	E12	V12	6.70	7.70	1705.0	R,H,L,M	NWIFC	CSS	YES	YES	QUARTZ MTN.
39.1128	S.F. TANEUM	E21	V20	4.70	6.70	3182.0	R,H,L,M	NWIFC	CSS	YES	YES	QUARTZ MTN.
39.1128	S.F. TANEUM	E31	V41	0.00	1.70	3282.0	R,H,L,M	NWIFC	CSS	YES	YES	FROST MTN.
39.1128	S.F. TANEUM	E32	V42	2.60	4.70	3361.0	R,H,L,M	NWIFC	CSS	YES	YES	FROST MTN., QUARTZ MTN.
39.1128	S.F. TANEUM	G21	H20	2.10	2.60	819.0	R,H,L,M	NWIFC	CSS	YES	YES	FROST MTN.
39.1351	M.F. TEANAWAY	B21	F30	0.00	4.20	6869.0	R,H,L,M	NWIFC	CSS	YES	YES	TEANAWAY BUTTE
39.1351	M.F. TEANAWAY	E31	V40	4.20	5.50	925.1	R,H,L,M	NWIFC	CSS	YES	YES	TEANAWAY BUTTE
39.1378	W.F. TEANAWAY	B21	F30	0.00	8.00	12272.0	R,H,L,M	NWIFC	CSS	YES	YES	TEANAWAY BT., CLE ELUM LK.
51.0046	NORTH STAR	B21	F31	0.00	3.50	3391.0	R,H,L,M	NWIFC	CSS	YES		
51.0046	NORTH STAR	C21	M11	5.00	5.80	1131.0	R,H,L,M	NWIFC	CSS	YES		
51.0046	NORTH STAR	C41	M21	3.50	5.00	1503.0	R,H,L,M	NWIFC	CSS	YES		
51.0046	NORTH STAR	E11	V11	6.10	6.70	1012.0	R,H,L,M	NWIFC	CSS	YES		
51.0046	NORTH STAR	E21	V21	6.70	7.10	532.0	R,H,L,M	NWIFC	CSS	YES		
51.0046	NORTH STAR	E31	V41	5.80	6.10	534.0	R,H,L,M	NWIFC	CSS	YES		
51.0046	NORTH STAR	E32	V42	7.10	8.00	1436.0	R,H,L,M	NWIFC	CSS	YES		
58.0016	SIX MILE	B31	F40	0.00	0.30	471.0	R,H,L,M	NWIFC	CSS	YES		
58.0016	SIX MILE	E21	V20	0.30	1.10	1271.0	R,H,L,M	NWIFC	CSS	YES		
58.0016	SIX MILE	E31	V40	1.10	2.70	2597.0	R,H,L,M	NWIFC	CSS	YES		
58.0356	HALL	E31	V40							YES		
62.0547	TACOMA	C41	M20	0.00	0.30	137.0	R,H,L,M	NWIFC	CSS	YES		
62.0547	TACOMA	E11	V10	0.30	1.00	320.0	R,H,L,M	NWIFC	CSS	YES		
62.0547	TACOMA	E31	V40	1.00	2.80	865.0	R,H,L,M	NWIFC	CSS	YES		

APPENDIX B

SPAWNING GRAVEL FINE SEDIMENT DATABASE

DATA DICTIONARY

DATA DICTIONARY for SEDIMENT SYSTEM

DATA TABLES

Table: **Stream**
Descr: Stream information

No.	Column Name	Attributes
1	WRIA	Type : TEXT 7 NOT NULL Consrnt: PRIMARY KEY Comment: Water Resource Inventory Number
2	SegNo	Type : TEXT 3 NOT NULL Consrnt: PRIMARY KEY Comment: Stream segment identification number
3	Collect_Date	Type : DATE NOT NULL Consrnt: PRIMARY KEY Comment: Collection Date
4	Process_Date	Type : DATE Comment: Sample processing date
5	Sampler_First_Name	Type : TEXT 20 Comment: Sampler's First Name
6	Sampler_Last_Name	Type : TEXT 20 Comment: Sampler's Last Name
7	GradCat	Type : TEXT 1 Comment: Stream gradient category
8	GradUMC	Type : TEXT 1 Comment: Channel confinement category
9	BegRivMi	Type : NUMERIC (6, 3) Comment: Beginning River Mile
10	EndRivMi	Type : NUMERIC (6, 3) Comment: Ending River Mile
11	Affil_Name	Type : TEXT 40 Comment: Affiliation Name
12	Act_Gradient	Type : NUMERIC (5, 2) Comment: Actual % of Gradient
13	Act_Confine	Type : NUMERIC (5, 2) Comment: Actual Confinement-No of bankful channel widths
14	trib	Type : TEXT 3 NOT NULL Consrnt: PRIMARY KEY Comment: unlisted tributary number

DATA DICTIONARY for SEDIMENT SYSTEM

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  Table: Sieve_Sample
  Descr: Sieve sample information
No. Column Name          Attributes
--- -------------------- -----------------------------------------------------
  1 WRIA                 Type    : TEXT 7 NOT NULL
                         Consrnt: PRIMARY KEY
                         Comment: Water Resource Inventory Number

  2 SegNo                Type    : TEXT 3 NOT NULL
                         Consrnt: PRIMARY KEY
                         Comment: Stream segment number

  3 Collect_Date         Type    : DATE     NOT NULL
                         Consrnt: PRIMARY KEY
                         Comment: Collection Date

  4 Riffle               Type    : TEXT 3 NOT NULL
                         Consrnt: PRIMARY KEY
                         Comment: Riffle crest number

  5 Sample               Type    : TEXT 3 NOT NULL
                         Consrnt: PRIMARY KEY
                         Comment: Sample number

  6 Sieve_Size           Type    : NUMERIC ( 6, 3) NOT NULL
                         Consrnt: PRIMARY KEY
                         Comment: Sieve Size

  7 Measure              Type    : NUMERIC ( 6, 1)
                         Comment: Measure of Gravel in millileters or grams

  8 Process_flag         Type    : TEXT 1

  9 Calc_Grav_Dens       Type    : NUMERIC ( 4, 2)
                         Comment: Calculated Gravel Density

 10 Act_Grav_Dens        Type    : NUMERIC ( 4, 2)
                         Comment: Actual Gravel Density

 11 trib                 Type    : TEXT 3 NOT NULL
                         Consrnt: PRIMARY KEY
                         Comment: unlisted tributary number
```

```
  Table: Sieve_Size
  Descr: Hold sieve sizes
No. Column Name          Attributes
--- -------------------- -----------------------------------------------------
  1 Sieve_Size           Type    : NUMERIC ( 6, 3)
                         Comment: size of sieve in mm

  Current number of rows:      7

     Sieve_Size
     ----------
        56.800
         0.085
         0.185
         0.087
         1.065
        26.500
         1.000
```

DATA DICTIONARY for SEDIMENT SYSTEM

LOOKUP TABLES

Table: WRIA_Lookup
Descr: WRIA Lookup table

No.	Column Name	Attributes
1	WRIA	Type : TEXT 7 NOT NULL Consrnt: PRIMARY KEY Comment: Water Resource Inventory Number
2	Str Name	Type : TEXT 25 Comment: Stream Name
3	Basin_Name	Type : TEXT 25 Comment: Basin Name
4	trib	Type : TEXT 3 Comment: unlisted tributary number

Current number of rows: 0

Table: Gradient-Lookup
Descr: Gradient lookup table

No.	Column Name	Attributes
1	GradCat	Type : TEXT 1 NOT NULL Consrnt: PRIMARY KEY Comment: Stream gradient category code
2	Gradient_Desc	Type : TEXT 25 Comment: Gradient description
3	Grad Min	Type : NUMERIC (5, 2) Comment: Gradient minimum for category
4	Grad_Max	Type : NUMERIC (5, 2) Comment: Gradient Maximum for category

Current number of rows: 7

GradCat	Gradient_Desc	Grad Min	Grad Max
1	Less than .1% gradient	0.00	0.10
2	0.1-1% gradient	0.10	1.00
3	1.0-2% gradient	1.00	2.00
4	2.0-4.0% gradient	2.00	4.00
5	4.0 6.0% gradient	4.00	6.00
6	6.0-17.0% gradient	6.00	17.00
7	>17% gradient	17.00	100.00

DATA DICTIONARY for SEDIMENT SYSTEM

Table: **Confinement_Lookup**
Descr: Confinement lookup table

No.	Column Name	Attributes
1	GradUMC	Type : TEXT 1 NOT NULL Consrnt: PRIMARY KEY Comment: Channel confinement category code
2	Confinement_Desc	Type : TEXT 20 Comment: Channel confinement description
3	Conf_Min	Type : NUMERIC (5, 2) Comment: Confinement minimum for category
4	Conf_Max	Type : NUMERIC (5, 2) Comment: Confinement maximum for category

Current number of rows: 4

GradUMC	Confinement_Desc	Conf_Min	Conf_Max
t	Tightly: <2 cw	0.00	2.00
m	Moderately: 2-4 cw	2.00	4.00
u	Unconfined: >10 cw	10.00	999.99
1	Loosely: 4-10 cw	4.00	10.00

Table: **GravDens_Lookup**
Descr: Gravel Density Lookup Table

No.	Column Name	Attributes
1	Calc_Grav Dens	Type : NUMERIC (4, 2)

Current number of rows: 3

Calc_Grav_Dens
2.90
2.20
2.60

DATA DICTIONARY for SEDIMENT SYSTEM

Table: **Affil_Lookup**

Descr: Affiliation Lookup

No.	Column Name	Attributes	
1	Affil_Name	Type	TEXT 40 NOT NULL
		Consrnt	PRIMARY KEY
		Comment	Affiliation Name
2	Calleral	Type	TEXT 3
		Comment:	ID Number of organization

Current number of rows: 64

Affil_Name	Calleral
AMSC	54
AMSC-U.W./CSS	59
Chehalis	02
Chinook	03
CMER S.C., Other	58
Colville	04
Cowlitz	05
DNR	69
DOE	70
Duwamish	06
EPA	66
Fish St. Comm.	55
Hoh	07
Hoh-Clw. ExpFor	52
Lower Elwha	08
Lummi	09
Makah	10
Medicine Cr T.C.	43
Muckleshoot	11
Nez Pierce	12
Nisqually	13
Nisqually RMP	51
Nooksack	14
NWIFC	01
Point Ellio5	41
Point No Point	40
Port Gamble	15
Public Coop.	63
Puyallup	16
Quileute	17
Quinalt	44
RMP, other	53
Samish	19
Sauk-Saiattle	20
SHAM	56
Shoalwater	21
Skagit Sy. Coop.	45
Skokomish	22
Snohomish	24
Snoqualmie	25
Spokane	46
Squamish	28
Squaxin Island	26
Steilacoom	27
Stillaguamish	36
Swinomish	29
Swinomish_Ab_	30
TFW Cooperator	62
Tulalip	31
U.S. Govt, Other	68
U.S./CSS	60
UCUT	47
Umatilla	32
UNDEFINED	78
Upper Skagit	33
USFS	64
USFWS	67
USGS	65
Warm Springs	34
WDF	71
Weyerhaeuser	61
WQSC	57
Yakima	35
Yakima RMP	50

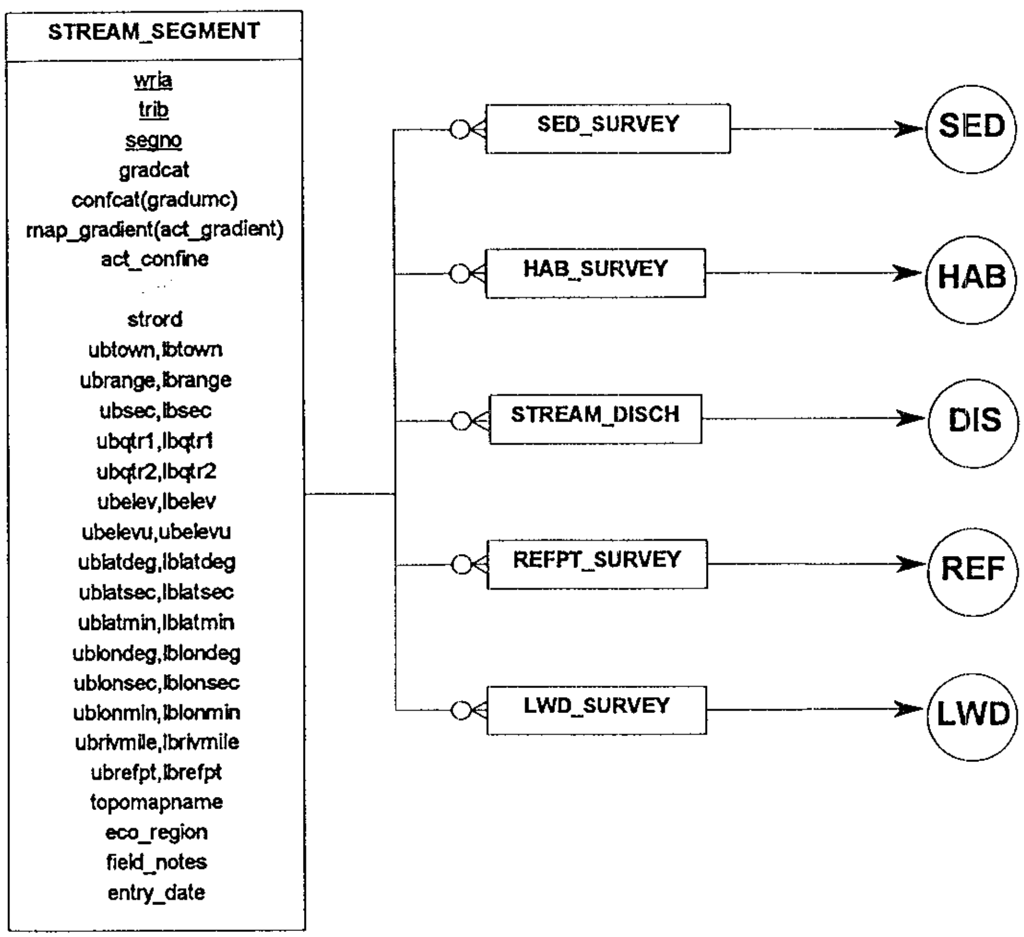
APPENDIX C

DATABASE DESIGN

FOR RELATIONAL TFW AMBIENT MONITORING DATABASE

CONTAINING ALL SURVEY YEARS AND SURVEY TYPES

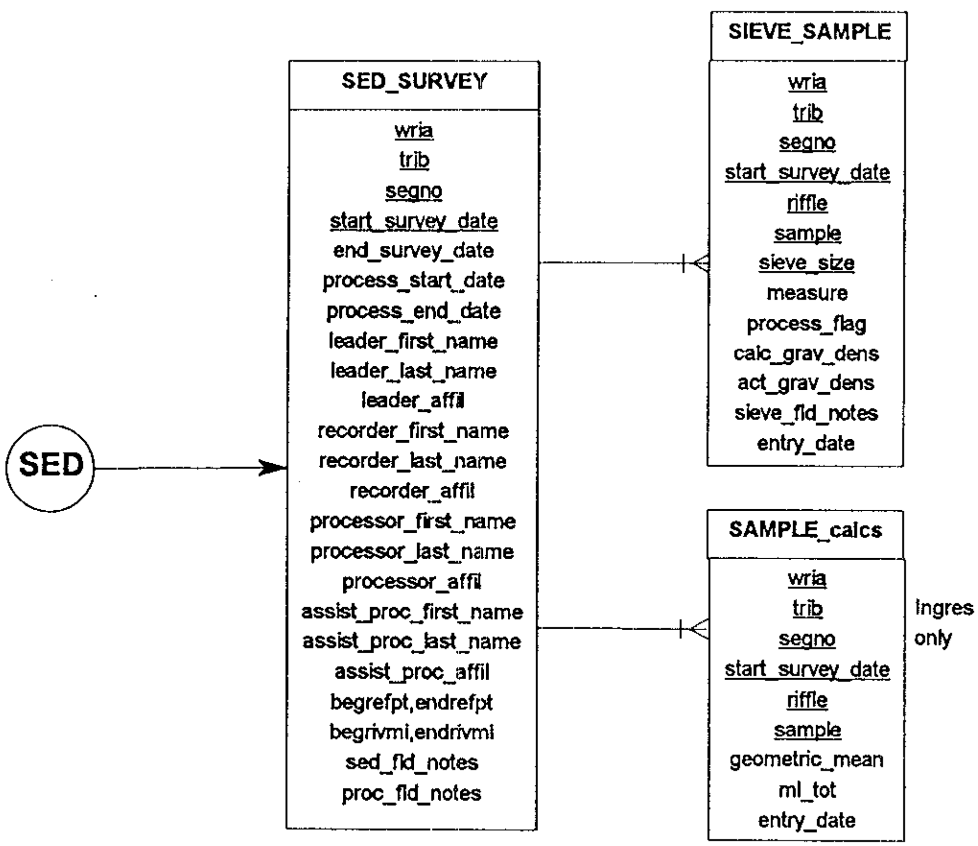
Note: underlined fields are keys



AMBIENT MONITORING DATABASE

MAIN DATABASE

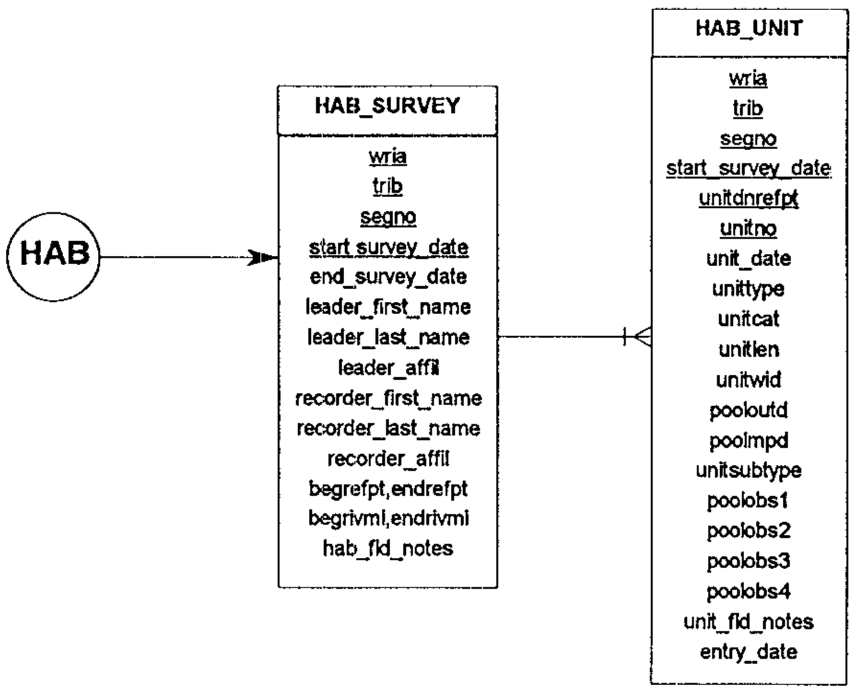
Note: underlined fields are keys



AMBIENT MONITORING DATABASE

MAIN DATABASE

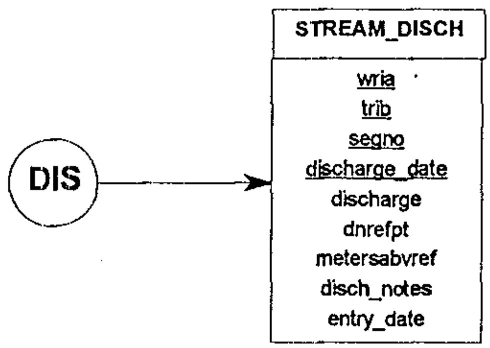
Note: underlined fields are keys



AMBIENT MONITORING DATABASE

MAIN DATABASE

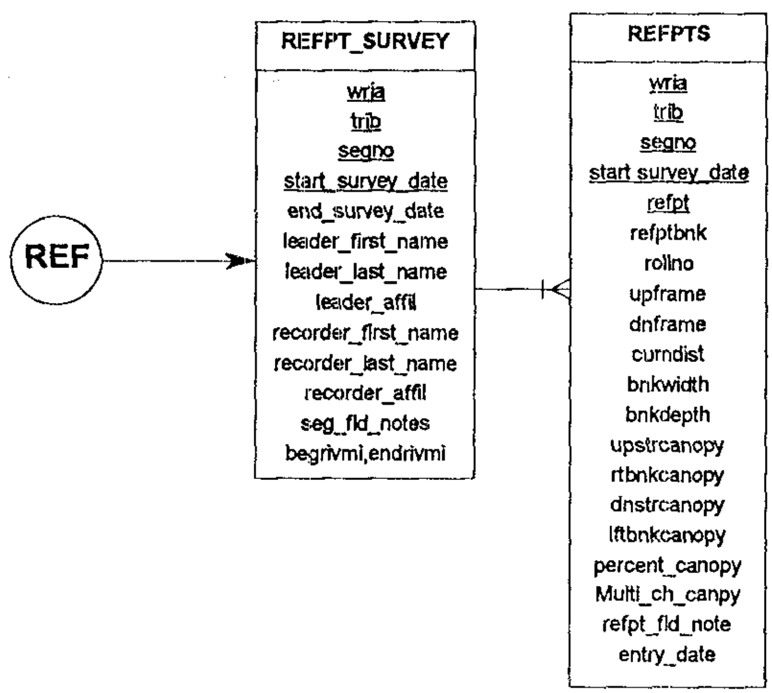
Note: underlined fields are keys



AMBIENT MONITORING DATABASE

MAIN DATABASE

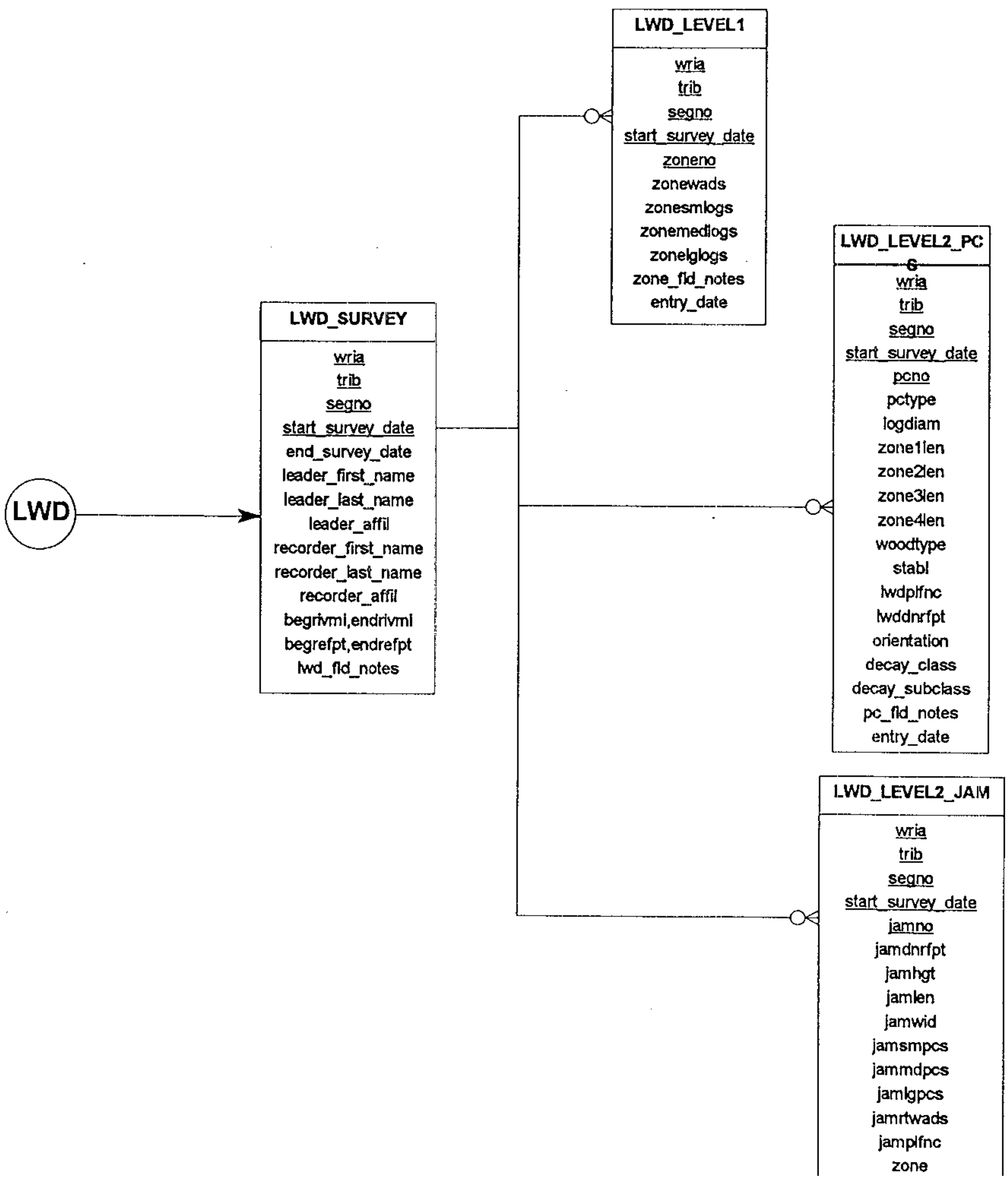
Note: underlined fields are keys



AMBIENT MONITORING DATABASE

MAIN DATABASE

Note: underlined fields are keys



AMBIENT MONITORING DATABASE

DATABASE LOOKUP TABLES

'89 - '94 LOOKUPS

wria_lookup
- wria
- trib
- strname
- basin_name
- trib bank

gravdens_lookup
- calc_grav_dens

pool_obs_lkup
- obstruct_code
- obstruct_desc

dec_cls_lookup
- dec_cls_code
- dec_cls_desc

gradient_lookup
- gradcat
- gradient_desc

confinement_lookup
- confcat
- confinement_desc

hab_unit_lkup
- unit_type_code
- unit_type_desc

unt_subtyp_lkp
- sub_type
- sub_type_code
- sub_type_desc

affil_lookup
- affil_name
- callera1 (affil_code)

gm_ml_conv (Ingres only)
- sieve_size
- gravel_density
- gm_to_ml
- ml_to_gm

orient_lkup
- orient_code
- orient_desc

AMBIENT MONITORING DATABASE

AUXILARY DATABASE (Ingres only)