Evaluation of the StreamNet data delivery systems obtained at the Western Division AFS meeting May 5-7, 2008

Bruce Schmidt
StreamNet Program Manager
Pacific States Marine Fisheries Commission

July 14, 2008

Executive Summary

The StreamNet Project used the annual meeting of the Western Division, American Fisheries Society in Portland, May 5-7, 2008, to solicit feedback on utility and function of the project's online data delivery systems. Meeting attendees were offered the opportunity to use the tabular and map-based query systems and provide feedback. The general summarized suggestions received were:

- Simplify the data delivery interfaces and make them more intuitive
- Be more inclusive of all sources of the data we specialize in to make data more complete
- Improve timeliness of data updates
- Provide a number of additional new features and capabilities, such as the ability to search with multiple criteria, improved means to search by stream name, etc.
- Provide additional types of data

This information will be very useful in a redesign of the data delivery systems planned to begin later this year.

Introduction

The StreamNet Project has been working to improve the function and utility of its data delivery systems on it's website www.streamnet.org. Despite providing multiple links on the website to make providing feedback easy, we have found it difficult to get responses from people who use the data we provide. Previous attempts to obtain feedback were an online questionnaire, and a Data Priorities meeting hosted by CBFWA in 2006. Those efforts were only partially successful in identifying priorities and provided little in the way of critique of the data delivery system functions. The annual meeting of the Western Division, American Fisheries Society (WDAFS) in Portland provided an excellent opportunity to work directly with biologists to show them the data systems and to solicit direct feedback. That feedback will be used in a planned redesign of the data delivery systems beginning later in the year.

Methods

WDAFS was very helpful in providing space in the hallway leading to several of the main meeting rooms. A table with a project display and three computers with wireless access to the Internet was set up and manned throughout the three days of technical meetings, May 5-7, 2008. Meeting attendees were invited to use the data delivery systems and asked to fill out a

questionnaire on their experience and to provide suggestions for improving the tabular and/or the map-based data query systems. Two versions of the questionnaire were provided, one for people experienced in using the StreamNet website and data queries, and the other for new users. In addition, StreamNet staff at the table recorded observations, ideas and suggestions as they interacted with people using the systems. A total of 24 questionnaires were returned (Appendix A), and several pages of notes were taken by StreamNet staff members (Appendix B).

Results

The general responses are summarized below. Detailed responses are presented in Appendix A. Since the questionnaires were slightly different for experienced and new users, these will be generalized. 14 respondents indicated previous experience using StreamNet, while 10 respondents were new to the system.

1. Data from multiple sources.

   Most users (20 of the 24 questionnaires – 83%) indicated that they use data from multiple sources or from agencies besides just their own. This finding helps illustrate the value of consolidating data from multiple sources so that they are compatible and consistent.

2. Kinds of data.

   As would be expected, interest was expressed in a wide variety of data types. In some cases, people were looking for data that are not included in StreamNet, some of which were never intended for inclusion in StreamNet as they are more appropriate for other entities. It should be noted that in the questionnaire for experienced users, we accidentally asked this question twice with only slightly different wording, so those results were consolidated.

   The top two areas of interest for both experienced and new users were Fish Distribution (42%) and Abundance (25%). Other data types requested that can be obtained from StreamNet or the StreamNet Library included fish passage barriers, information about individual species, reports, policy documents, ESA Critical Habitat designations, some specific GIS layers (hydrography, fish distribution, water quality), and life history / fish biology information.

   Requested information that is not currently available in StreamNet that would be appropriate for the project included fish presence/absence (i.e., documented occurrence), catch per unit effort estimates, survival estimates, data by fifth field HUC, stocking/releases, habitat restoration projects, additional barrier data, fish habitat data, and hatchery supplementation data and hatchery program information. We are currently working toward including some of these, such as stocking/releases, additional barriers, and providing data by HUC[5]. We have developed a prototype database for habitat restoration projects, but have not received support to consolidate this information from the many independent sources. We are also working to obtain and disseminate hatchery information from the Hatchery Scientific Review Group.

   Some requested information is more appropriate for other projects or agencies, such as water quality data, water temperature data, PIT tag data, some GIS layers, water flow data, and

high resolution hydrography. We are interested in participating in collaborative efforts to pull some of these data together from (or link to) other sources and provide them along with fish data.

3. Which StreamNet data system was used.

   Respondents at the WDAFS meeting evidenced a slight preference for using the interactive map interfaces (11) over the tabular query system (9). Five questionnaires left this question blank, and at least one individual used both. We did notice that having a map showing on the screen caught people's eye more frequently. These results support the value of providing both interfaces to the data, given that some data types are more useful in a spatial interface than others, such as fish distribution, while other data types are of use for statistical analysis in a tabular format. It should be noted that the mapper interface also allows discovery and download of tabular data, but it is restricted to one location (stream) at a time, and some users found it difficult to learn how to access tabular data from the mapper, suggesting that better instructions or a more intuitive process are needed.

4. Most important aspect of the data.

   The most frequently listed aspects were: Species – 13, Location – 12, Specific data type – 8, and Facilities – 4. Many left this question blank.

   This question proved less helpful than hoped, as many people listed multiple "most important" aspects. The above numbers represent the number of times an aspect was mentioned. It was not possible to determine if the frequency of including a factor related to which criterion people thought most important or usually started with. This question was more relevant to tabular system users, since the mapper limits users to beginning with location. This result does reemphasize the fact that there are multiple aspects to finding data, and different system users may prefer different approaches.

5. What is your preferred or most often used sequence of entering query criteria?

   This question elicited few useful responses, and many did not respond. Mapper users are constrained to selecting location first. Tabular system users have multiple options, but few provided a sequence of criteria.

6. Success of query at WDAFS.

   New users were asked whether their trial query at WDAFS was successful. A majority of those responding to the question chose not to respond to this question (60%). 30% answered "Yes", while 10% answered "No." The short time available and other competing activities could easily have impacted success.

7. What failed using the query.

   New users trying the query system who indicated problems with their trial use were asked what went wrong. A person representing a tribe pointed out that data from his area of

interest was not included in the StreamNet data, and distribution information for streams on tribal lands was incorrect. This highlights a known limitation with data inclusiveness, and further emphasizes the need to work with tribal managers to assist them with data management and to include their data in the regional data sets.

Another problem noted was that some dams (smaller) do not show in the StreamNet dams list. This is likely because of the size threshold for including dams in StreamNet. Many small dams, less than ~10ft. in height, are not currently included, yet they may be significant to fish passage. Those not currently included in the Dams data set should be included in the Barriers table if they block fish movement.

8. Satisfaction with data content.

   With all questionnaires combined, 44% of respondents reported they were somewhat satisfied with the content of the StreamNet data. 12% were neutral, 12% were somewhat dissatisfied, and 8% (2 people) were completely dissatisfied. 24% did not respond to this question. This broad array of opinions suggests that we need to improve aspects of our data content. We may also need to be more explicit about what data are available to avoid people looking for data that are not contained in the database so that they don't waste their time.

9. Specific dissatisfactions with data content.

   A variety of specific reasons were given for dissatisfaction with data content.

   Data currency was the single most mentioned problem. People were frustrated that the most recent data were not always available. At least one person also recognized that this may be a problem at the source. One specific example was that some fixed or replaced barriers have not been updated in the database. Other responses were generic.

   Lack of specific data or incomplete data were other key reason for dissatisfaction, including data that are not included but should be (such as tribal data); lack of information for some specific small, unnamed streams; incomplete list of barriers; and "not all criteria for all sites". One person requested a confirmed fish distribution layer. Some people wanted data that are not currently considered as StreamNet's focus or responsibility, such as high resolution hydrography, elevation data, land use, watershed data, geology, etc.

   A number of additional issues were listed, including difficulty narrowing down the broad data, having to go to the states to get the "best available" distribution data, need to see source of information for distribution, and a need to be able to use multiple search criteria.

10. Satisfaction with query system function.

    With all questionnaires combined, there was a wide spread of ratings, with 3 fully satisfied, 5 somewhat satisfied, 5 neutral, 0 somewhat dissatisfied, and three completely dissatisfied. 8 people did not address this question, all of them new users. The other two new users rated system function as fully and somewhat satisfied.

11. Specific dissatisfactions with query system function.

Opinions of specific problems with the query system ranged widely.

Several people noted the need to be familiar with the icons/tools/functions (one person rating the system "completely dissatisfied" went on to say in this question that the dissatisfactions were "none – just familiarization of tool locations and function buttons."

Several people referred to too many steps or the query being "laborious". One person (who marked using the mapper) thought it complicated for those not used to query logic and felt it wasn't "user friendly".

Additional comments included getting different results from tabular query v. the mapper, overlapping regions on the OR coast, the number of streams as a handicap to finding data, the need to be able to enter streams when using Query by Form, and a desire for finer scale (to 5th or 6th field HUCs).

12. Suggestions for improvements.

Respondents provided a large number of specific comments, suggestions and recommendations (Appendix A). Following is a consolidated summary of those suggestions.

- Include data from more agencies/tribes to make data more comprehensive
- Make the delivery system more user friendly
- Provide additional kinds of information
- Allow search by multiple criteria at once
- Be able to go to a location and find all data for that location (Note: we already have this capability in the mapper. We need to tell people how to use that function better.)
- Improve search for data by Stream
- Highlight the limitations/implications of sorting by county, HUC, etc – what will be included or excluded.

13. Suggestions from StreamNet staff

Comments, suggestions and ideas from StreamNet staff who participated in the sessions at the WDAFS are presented in Appendix B and are summarized below (Table 1).

Table 1. Summary of ideas and suggestions recorded by StreamNet staff members.

No.	Summarized comment, idea or suggestion
1.	Display / Format Issues – Interactive Mapper Interactive map tools are not intuitive – give better instructions, or make obvious Error message when "Map it" when accessing distribution through mapper (since fixed) Improve summary report from 'Get Data' tool: include Stream name and LLID, Fish Distribution data category should list the # of species with data, not "1 stream" Generally need to simplify interface – get rid of the need to select an active layer, etc. Simply limit the queriable layers and combine tools where possible

	Highlight 'Get Data' function, many users not aware of this way to find data Create "Identify species" tool. Click on stream, see list of species, uses there. For Sightings, display dots and highlighted reaches where there is doc. Occurrence On map, tabs on top to turn on data type, highlight streams w/ that type, then Get Data Hover on stream, pop up or balloon to show data types available. Then, click View Data, Graph Data, or Download Data. Mapper have link to table of available GIS layers. Get info by sub criteria like county, HUC, etc. Elevation? Other base layers? Or, links to these. Provide more layers (e.g., land use, geology, etc.) Stream should be first layer listed Turn off land ownership on initial map view Use folders to collapse # of layers With "Find" tool, all tribs light up. But, if you then click one trib, data for only that trib should display, not all. Allow display of multiple species at same time via mapper (difficult to do) Provide ability to enter a lat/long and then go there Fish distribution by species should have a "previous extent" button Advertise ability to directly connect to map services via GIS desktop clients Display Source, or link to Source, on Fish Distribution. Is metadata verified? Clearly need to move toward use of ArcGIS Sever and use of cached maps. Remove the table of contents and have base map be static and cached. Would it be possible to highlight several streams by clicking them in sequence, and then clicking a "see data available" button that returns all data for all of the streams?
2.	Display / Format Issues – Tabular Query Want ability to do "Or" queries so can show several species or regions On tabular displays, keep column headings visible On Trend counts, show date of the actual counts Hard to find data by stream (too many). Provide ability to type in stream name Some species distribution doesn't show up under "Map it" Species should have a category that is inclusive of all subspecies plus "unspecified ssp" Clarify what is included/excluded when select by geographic area (e.g., HUC, county) When select Trend No., next screen does not show stream name, but should. Show both WQS needs simple and obvious help function. Context sensitive? Request for Google type query Update the User Guide Not obvious to click on Trend No. to get information on a Trend record. Not sure what "Trend" means. Trends, if select a Year, shows all trends that include that year and data for all years. Is that the intent, or intend only to show the particular year? Context specific help? Data Holdings was confusing to all new users. Thought it was link to data Dereferencing issues, Barriers 62138, 62164, and 62194. Source for effects of barrier? When using the standard query user's were not clear on "what to do next?", The 'data categories' items on left side of WQS interface should possibly be an open running report that summarizes the available data by category as other criteria is selected. Better explain the process by which data is fed into StreamNet, georeferenced, standardized, etc. Even frequent users unaware of how data flows into SN. If the full scope were better understood, users may be more understanding of limitations

	Provide a "Build a Download" feature: By form, allow multiple specifications (multiple species, locations, HUCs, etc.) then hit "build download" to create a large spreadsheet of all of the specified data. No need to try to display the data
3.	Display / Format Issues – SN Website Fix "Kinds of Data" link in About StreamNet to list data types available. Home page, one button each for: Fish data–tabular format, Fish data-map format, GIS layers, Library, etc. Allow user profile, people set consistent format, site remembers Why is Pacific Coast Marine Habitat Program in SN Quick List? To pick query type, provide text and picture/icon to help visualize what each one is
4.	Data Errors / Issues: Okanagan R. fish distribution shows only "Migration", no spawning / rearing Fish distribution in streams on Colville Reservation is not included Western OR shows disproportionally (need to update LocX tables?) Stream fragment, no connections. LLID # 1217419450960 Explain SN is not seamless, data from many sources don't always interact, so can get differences in data. Incorrect use of trends by compilers for simple observations Whatcom L. Dam and Whatcom Falls Dam on Nooksack Cr. are the same dam Dams that are barriers should be included in the Dam Facilities. Some are not.
5.	Observations of systems users: Uses SN to compare / verify his internal data Uses SN for Fish Distribution – loves it Invitation: Attend and give similar display at N. Pacific International Chapter Apr 20-23 Most who have used before wanted increased capabilities USFS user wants HUC-5 in WQS, since they do all their analysis by HUC-5 Non-salmonid data not comprehensive enough for inclusion (e.g., prickly sculpin). USFS biologist expressed an interest in Habitat restoration data. USFS continues to submit their data to IRDA. Would like to be able to identify existing/past restoration projects along with all fish data available within a HUC5 Newsletter. Text comes across as garbled mess. Send formatted version (pdf)
6.	Process Issues: Include tribal representatives in mapping parties for fish distribution Incorrect or missing data from several tribes (Colville, Yakama) Iron out use of Super RefIDs w/ Lenora and Greg Library can use multiple URLs per RefID, but can WQS deal w/ them w/o SuperRefID?

Conclusions

The WDAFS meeting provided a significant number of useful suggestions for improving the delivery of data from the StreamNet Project. While some issues raised were already known, participants at the meeting provided new insights and perspectives on known issues in addition to identifying new needs or problems.

These results will be used to guide a complete redesign of the project's data delivery systems, planned to begin later this year. All suggestions received will be evaluated for relevance to the StreamNet mission, technical feasibility, and cost relative to available staff time and capacity. A phased approach is most likely under current capabilities, so needed changes will be prioritized. As new concepts are mocked up, we may sponsor additional meetings with system users or focus groups to gain insight into the most useful approaches. Progress will be reported in the periodic StreamNet Newsletter.

In a few cases, comments received from meeting participants were unclear, or we need additional information to help us fully understand the comment. In those cases, we may contact the individual to ask for additional input or clarification. We intend to try and minimize such imposition, however.

In the most general sense, the overarching themes of input received at the WDAFS meeting were:

- Simplify the data delivery interfaces and make them more intuitive
- Be more inclusive of all sources of the data we specialize in to make data more complete
- Improve timeliness of data updates
- Provide a number of additional new features and capabilities, such as the ability to search with multiple criteria, improved means to search by stream name, etc.
- Provide additional types of data

The results also showed where existing capabilities need to be highlighted. This was evident when people requested capabilities that already exist, such as the ability to navigate to a location and request a list of all data that exist for that location.

This effort also provided an opportunity for project staff members to observe people using the data delivery systems and discuss their needs. This provided opportunity for staff members, who are already familiar with system functions, to devise new ideas for ways to meet people's needs. Those ideas and the results from the questionnaires will be very helpful as we work to improve the function of our data delivery systems.

We appreciate all of the time and suggestions put forward by those who participated in the review of the StreamNet data delivery systems and the space and assistance provided by the Western Division, American Fisheries Society.

Appendix A

Questionnaire and results from WDAFS meeting

A. Results from **NEW** users

A total of ten questionnaires were returned for people who had not used Stream Net previously.

1. Do you often use data that originate in different or multiple agencies?
   Yes 7
   No 2
   Not specified 1

2. What kind of fish related information would you like to find today?
   i. Distribution (general, golden trout, steelhead, spring Chinook, westslope cutthroat trout) - 5
   ii. Abundance (abundance in general, spawning survey data, adult Chinook returns past Bonneville Dam) - 3
   iii. Stream resource information near Willapa National Wildlife Refuge - 1
   iv. Westslope cutthroat trout information - 1
   v. Data by Huc5 - 1
   vi. Stream restoration locations and data – 1
   vii. None specified - 1

   New users predictably expressed interest in a range of types of information. The most common type was fish distribution, followed by abundance. Users also wanted data for several specific species.

3. Which system did you try?
   i. Tabular data query 4
   ii. Interactive mapper 7

   At least one user tried both systems

4. What is the most important aspect of the data you want?

<u>Those using the mapper</u> (n=7)		<u>Those using the tabular system</u> (n=4)	
Location	6	Location	1
Species	4	Species	2
Facility (dam)	1	Facility	1
Specific data types	1		

   Several users listed multiple factors as “most important”, e.g., location/species

5. What is your preferred sequence of entering query criteria?

Those using the mapper (n=7)		Those using the tabular system (n=4)	
Location, species	1	Unspecified	3
Map location first	2	"Click on map"	1
"Easiest"	1		
Unspecified	3		

6. Was the query successful?

Those using the mapper (n=7)		Those using the tabular system (n=4)	
Yes	2	Yes	1
No	1	No	0
Unspecified	4	Unspecified	3

Note: one person was in both categories (no respond to this question).

7. If "No", what happened that didn't work?

   The one person indicating lack of success pointed out that tribal data was missing from the StreamNet database and data (distribution) based on his knowledge in specific tribal areas was incorrect ("Migration" with no "Spawning & Rearing" above, some streams not showing distribution that should).

   In one case of no response to this question, it was pointed out that some dams are missing from the Dams list, presumably an issue of the size criteria for inclusion in our list, which is only "major" dams.

8. How would you rate your satisfaction with data content?

Those using the mapper (n=7)		Those using the tabular system (n=4)	
Completely dissatisfied	1	Completely dissatisfied	0
Somewhat dissatisfied	0	Somewhat dissatisfied	0
Neutral	0	Neutral	0
Somewhat satisfied	3	Somewhat satisfied	1
Fully satisfied	0	Fully satisfied	0
No entry	3	No entry	3

9. Please describe any aspects of or problems with data content that did not satisfy needs.

   Data is wrong (tribal data is missing)
   Not much information for the small unnamed streams I am interested in.

10. Please rate your satisfaction with query system function:

Those using the mapper (n=7)		Those using the tabular system (n=4)	
Completely dissatisfied	0	Completely dissatisfied	0
Somewhat dissatisfied	0	Somewhat dissatisfied	0
Neutral	0	Neutral =	0
Somewhat satisfied	1	Somewhat satisfied	0
Fully satisfied	0	Fully satisfied	1
No entry	6	No entry	3

11. Please describe any aspects of **query system function** that you did not like:
    Some difficulty understanding icons, but not bad.

12. Please offer any suggestions for improving the data query systems or website:
    No suggestions were written down

B. Results from **PREVIOUS** users

A total of 14 questionnaires were returned from people who had previously used StreamNet.

1. Do you often use data that originate in different or multiple agencies?

Yes	13
No	1
Not specified	0

2. What kind of fish related information do you most often look for in StreamNet?

i.	Distribution (general, range)	5 (36%)
ii.	Abundance (general, trends, redd counts, escapement, Chinook)	3 (21%)
iii.	Presence/absence	2 (14%)
iv.	Flows	2 (14%)
v.	GIS layers	2 (14%)
vi.	Fish passage barriers	1
vii.	CPUE	1
viii.	Temperature	1
ix.	Survival	1
x.	PIT tags	1
xi.	Reports	1
xii.	Supplementation data & program information	1
xiii.	Chinook salmon history	1
xiv.	Policy documents	1
xv.	ESA and EFH Critical Habitat	1
xvi.	Stocking/releases, marking	1

3. Please rate your satisfaction with <u>data content</u>?

Completely dissatisfied	1 (7%)
Somewhat dissatisfied	3 (21%)
Neutral	3 (21%)
Somewhat satisfied	7 (50%)
Fully satisfied	0
No entry	0

4. Please describe any aspects of <u>data content</u> that did not satisfy your needs:
    i. Completely dissatisfied:
        1. Would like to see higher resolution data (i.e., 1:24K), especially hydrography.

2. Also, elevation data is a common need

ii. Somewhat dissatisfied:
   1. Biggest problem is not a StreamNet shortcoming but a reporting problem to get most recent available data
   2. The data covers a broad area and it is difficult to narrow data information.
   3. Some data is incomplete.
   4. Sometimes dated. Sometimes disagree with latest from reporting agency

iii. Neutral
   1. Some fixed or replaced barriers not updated in information
   2. Many barriers not shown

iv. Somewhat satisfied:
   1. We have had to go to the states to get the "best available" fish distribution data.
   2. Not all criteria for all sites
   3. Data was not up to date
   4. Include more watershed, land use, geology, etc.
   5. It would be beneficial to see what sources the information is derived from (e.g., ODFW, NMFS, etc.)
   6. Displaying multiple search criteria
   7. An attributed and confirmed fish distribution layer would be helpful.

5. Please rate your overall satisfaction with <u>query system function</u>:

Completely dissatisfied	3
Somewhat dissatisfied	0
Neutral	5
Somewhat satisfied	4
Fully satisfied	2

6. Please describe any aspects of <u>query system function</u> that you did not like:

i. Completely dissatisfied
   1. There are too many steps and not enough information to help a user use the system. When I try to query data I go through 6 or more steps and still can't get to where I need to be.
   2. None – just familiarization of tool locations and function buttons

ii. Neutral
   1. Not that familiar with query system
   2. Got different results with data query vs. mapper
   3. regions were overlapping on OR coast
   4. 1,000 streams handicaps finding data
   5. Why isn't Stream list in Query by Form?

iii. Somewhat satisfied
   1. Standard query can be somewhat laborious
   2. Can be somewhat complicated if you are not used to query logic. Have had problems after I have directed watershed coordinators to the site. Not the most user friendly system.

3. Scale was too coarse. I would like to see 5th or 6th field watersheds.

7. Please offer any suggestions for improving the data query system (content or function) or the StreamNet web page:
   i. Try to include more agencies so we can have a comprehensive data source.
   ii. Make things user friendly – have better descriptions or interactive maps that help the user find their data.
   iii. Query information (data trends) by stream/HUC – all trends
   iv. Integration of BPA sponsored reports
   v. Would like to see higher resolution data (i.e., 1:24K) especially hydrography.
   vi. Also, elevation data is a common need.
   vii. Display multiple species or search criteria simultaneously
   viii. Using a map Busied function. Be able to go to a location and find all the information available for the site or reach.
   ix. Continue to add more information and links
   x. Tell the user the limitations they may face if they sort the data by county, HUC, etc. Some of the data may not show up.
   xi. Smolt/Downstream counts.

8. Please describe any features or aspects of StreamNet data delivery that you liked:
   i. Stream specificity – shows data specific to smallest watershed, which is great.
   ii. Good broad scale data
   iii. Easy to access, easy to use
   iv. The technical support/designers were great at AFS
   v. I like the tabular view for seeing what layers are available
   vi. Despite minor inconveniences, it is still a great tool.
   vii. Good user interface, and data integration.
   viii. The abundance of data and the one stop aspect.
   ix. Ability to add reference to end notes and other bibliography references.
   x. I like having access to all of the GIS data

9. Which data delivery system do you most often use (or used today at WDAFS)?
   i. Tabular 5
   ii. Mapper 4
   iii. Unspecified 5

10. General description of what data you normally look for or are looking for at AFS:
   i. Distribution 3
   ii. Fish presence 2
   iii. GIS layers (hydro, fist distribution, water quality, barriers, etc.) 2
   iv. Abundance (population trends) 1
   v. Fish biology 1
   vi. Life history information 1
   vii. Genetics information 1

11. What is the most important aspect of the data you want?
    i. Species 2
    ii. Location 0
    iii. Facility 0
    iv. Specific data type 0
    v. Species and location 3
    vi. Species, location and facilities 1
    vii. Species, location and abundance 1
    viii. Species and abundance 2
    ix. Species and range 1
    x. All 1

    Note that one person wanted species and abundance as video or sonar counts, which StreamNet does not have. We do have dam counts, which in some cases are taken from video counts at ladder windows.

12. Do you have a preferred or most often used sequence of query criteria?
    i. No 1
    ii. Region, HUC or Stream, Data Type (trends) 1
    iii. Did not answer 12

13. Is your data search usually successful, or was it successful today?
    i. Yes 7
    ii. No 0
    iii. In between 1
    iv. Did not answer 6

14. If "No", what doesn't work or didn't work today?
    i. Got different results with data query v. mapper, regions were overlapping on OR coast, 1,000 streams handicaps finding data, and no Stream list in Query by Form.

15. Please describe any other problems you have encountered, or offer suggestions for improving the data query system, interactive mapper or StreamNet website:
    i. Make sure data is current. I realize this can be hard to do coming from multiple agencies.
    ii. In the past I have had difficulty accessing information or reports, but have not used StreamNet lately
    iii. Got different results with data query v. mapper, regions were overlapping on OR coast, 1,000 streams handicaps finding data, and no Stream list in Query by Form. Query information (data trends) by stream/HUC – all trends.
    iv. Good site for broad scale

Appendix B

Comments, suggestions and ideas recorded by StreamNet staff at WDAFS

The following thoughts and ideas were recorded by StreamNet staff during the WDAFS meeting. They came from discussions with people visiting the table and from personal thoughts while observing users or from working with the systems themselves. These are presented in no particular order, and are not summarized.

1. In "About StreamNet", when you click "kinds of data" link in the first paragraph, it does NOT go to a list of kinds of data. Instead, it presents a list of functions with explanations. The user wanted to see what kind of data were in the system, but this link did not tell them that, even though it seemed like it should by the wording of the link. The paragraph provides a description of the project, but does not tell what people can get from it. **Conclusion**: People want to see "what data can I get here?"
2. No references to source for distribution
3. Titles to the columns should stay visible (rows should scroll up under the headings)
4. What is the date of the actual count?
5. What is distribution based on? I.e., a "Source" button
6. Okanagan River. – shown all as "Migration", no spawning and rearing shown
7. They (tribe) have never been asked to participate in mapping parties to determine fish distribution.
8. IMS tools – not intuitive, doesn't tell you how to use them
9. Error message when click "Map it" for fish distribution when accessed the data through the IMS interface.
10. Need to be able to enter stream name in a county where there are too many streams to show a list.
11. Some species distributions don't show up under "Map it"
12. Uses to compare/verify internal data
13. Uses SN for Distribution – loves it
14. Wants to know if metadata is verified – maps
15. Text newsletter is garbled mess – send formatted version – pdf, html
16. Species, such as cutthroat, should be (?) inclusive of all subspecies, OR should be specifically named "cutthroat (unspecified subspecies)". [to get all cutthroat data, you need to query multiple times] Perhaps allowing multiple species queries would be the best bet, but if that is not possible – then rename to "cutthroat (unspecified subspecies)".
17. Western Oregon trends show up disproportionally depending on criteria selected – need to finish LocX tables.
18. A user asked about whether a trend that spanned multiple HUCs (in discussion about adding additional HUC5/6) would be truncated at the boundary or include number beyond the boundary. Bruce and Bill's understanding differed from Mike's about what is returned – we should all know what is used (perhaps an option to include/exclude based on criteria). But he said users should at least be given a message/warning about what might be excluded based on criteria selected.

19. On IMS – Fish Distribution: On using "Get Data" tool, result for Fish Distribution should show the # of species available for the selected stream. It currently shows the # of streams there is distribution for (always 1, since click on one stream to get data!)
20. Alternative way to view. Have additional tool to "ID Species" on any stream – click stream and see how many species are in that stream, and use type.
21. For "Sightings", dots or highlighted stream reaches w/ documented occurrence.
22. Iron out use of Super RefIDs w/ Lenora and Greg
23. Library can use multiple URLs per RefID, but, can the WQS deal with multiple URLs w/o creating a SuperRefID
24. North Pacific International Chapter AFS meeting April 20-23, 2009, Olympia. Invited us there for next year's meeting.
25. Map to locate data: Tabs on top to turn on each Data Type, highlights streams that have that type of data. Or, data by species? Or, both? Then, use "Get Data" tool to see table of all data for a given stream.
26. Use a pop up on hover – Data types available for a given stream or a point like Google – click on a balloon = what data are available, then click "Graph" or "Download".
27. Interactive mapper should also have a link to table of available GIS layers. Get information by sub criteria like county, HUC, etc. Elevation? Other base layers? Links to?
28. Thoughts about the initial web page. One button each:
    a. Fish data – tabular
    b. Fish data – Map
    c. GIS layers
    d. Etc.
29. Allow User Profile w/ consistent format as set by user, then remember?
30. When user selects a Trend No., the next screen does not include the Stream name. Stream name is more important at that point than Trend No. Better, show both.
31. On the Map application:
    a. Streams should be the first layer listed on the left.
    b. Land ownership should not be visible by default, it only clutters up the map.
    c. Collapse the various layers by category, such as one button (expandable) for ESUs, one for 303d, etc.
32. When you click "Get Data" on map, pop up window does not include the Stream name, but it would be useful if it did. The next screen with Data Types does show the Stream name, and that one is OK.
33. Idea: Combine the Identify and Get Data (or Get Information?) tools into a single tool so only have to click once. Or, leave Identify tool alone so it can be used with other layers, but include its name function with the Get Data tool.
34. Find tool: When use the "Find" tool, a stream and many tributaries to it light up. But, when you click the link to one of the tributaries, only THAT stream should be lighted, not all.
35. Random observation: A seeming fragment of a stream with no connection downstream. On NW edge of Warm Springs Reservation, LLID # 1217419450960
36. Most everyone who had used StreamNet before wanted increased capabilities.
37. Several people wanted the ability to do "OR" queries: species = steelhead OR cutthroat trout (so that both species are returned in the results); Region = North

Oregon Coast OR South Oregon coast (so that all Oregon coast data could be retrieved at once)

38. IMS-specific
    a. At least 2 people asked for more layers in the IMS. Specific ones I heard were land use and geology
    b. Ability to enter lat/long and then go there
    c. The species-specific mapper called from the fish distribution category of the WQS should have the "previous extent" button.
39. We need to explain to people that StreamNet is not one big, seamless, coordinated data set. We need to explain that we have data from many sources, and several data sets that do not directly interact. So differences can occur between different parts of our data. We coordinate data formats and location coding, and we point to all the source documents. It's possible for one number to disagree with another -- that's one of the reasons for the source documents being available from the library.
40. Query system needs a simple and obvious help function
41. Google-type query requested
42. We need to update our user's guide. Maybe what Bruce put together for the AFS meeting would do it?
43. Quite a few people could not figure out to click the TrendID to get the individual counts. This was quite confusing to people.
44. We have some data errors that result from our data compilers not knowing that our trend-based data structure is not appropriate for simple observation data. For example, somebody came across "estimates of spawning populations" for some electrofishing data in the Willamette -- 2 sculpins were shocked in some creek. This is an error that should be fixed if we go to a structure like what I've made for Tara to use for the coastal cutthroat work.
45. Query system: Pick a year, and then the trends show other years' data. Is this how we meant that to work? Should we change that so only the year asked for is returned? Or should we re-characterize what "select a year" means? (I just had an obvious and brilliant idea! When someone clicks on a criterion and gets the list to choose from, why do we not tell them at the top what it is that's going on? Maybe that's a good place for the simple and obvious help mentioned in #40 above. I'm a variable genius!)
46. Request for HUC-5 in the WQS was made by a USFS person who said they do all their analyses by HUC-5.
47. Related to #43 above: "Trend No." on the trend list page was quite confusing to people. They had no idea what it meant. This is something I've felt for a long time. "Trend" is jargon used within StreamNet -- it's not standard language to refer to a time series.
48. The "Data Holdings (All Categories)" link confused almost all new users. Most people who had never used the query system before thought that was the link to click to get data. (I recommend we move that, and the "Search trends" way down on this page, in a different, smaller font, or just plain get rid of them entirely.)
49. I believe we have something being de-referenced incorrectly in the WQS for barriers. I selected species = coho and looked at BarrierIDs 62138, 62164, and 62194. In the WQS output these have "Limits upstream distribution", "(99)", and "Fragments habitat" for the "Effect of Barrier" column. But I can't find where these came from.

50. Why is the Pacific Coast Marine Habitat Program web site in the StreamNet quick list?
51. When picking a query type, someone suggested we provide text and a picture/icon to help people visualize what each one is.
52. We have to discuss again what selecting a HUC, county, etc. means. Should data returned be limited to the selected area, or any data even partially in it? Bruce and Mike have opposite recollections of the decision that was made for this. Whatever the decision was before, I suggest we give users the option. Greg has pointed out, though, how incredibly tangled it would get if somebody wanted to do several of the things mentioned in this list: county = X (entirely within) or county = Y (any part) and species = coho OR species = steelhead and year = 2006 or year = 1993, etc. We do need to discuss priorities. (This is related to or same as #18)
53. Yakama Tribal Fisheries biologist indicated an error in our coho distribution dataset. He specifically pointed out that coho are present in the Yakama river above Ellensburg and all the way up to Cle Ellum Lake. He identified Todd Newsom as the tribe's coho expert. We should follow-up on that particular shortfall and improve the flow of data from the tribes. This was just one example.
54. One user from Western Washington University indicated that our dams table carried the same dam twice under different names. Specifically, he claimed that 'Whatcom Lake Dam' and 'Whatcom Falls Dam' on Nooksack Creek are one in the same. Need to follow-up on this.
55. Re. mapper: Allow display of multiple species at same time via mapper (difficult to do)
56. Re. mapper: Advertise ability to directly connect to map services via GIS desktop clients
57. Re. mapper: Highlight 'get data' function, many users not aware of this approach to data exploration
58. Re. mapper: Improved summary report generated by 'get data' tool, Title should include both Stream name and LLID, In summary list, Fish Distribution data category should list the number of species for which data exists not "1 stream" (users already selected a single stream to generate report).
59. Re. mapper: Generally need to simplify interface – get rid of the need to select an active layer, etc. Simply limit the queriable layers and combine tools where possible
60. Re. mapper: Clearly need to move toward use of ArcGIS Sever and use of cached maps. Remove the table of contents and have base map be static and cached.
61. Re. tabular WQS and content: When using the standard query user's were not clear on "what to do next?", The 'data categories' items on left side of WQS interface should possibly be an open running report that summarizes the available data by category as other criteria is selected.
62. Re. tabular WQS and content: User noted that data on other than salmonids seemed not to be comprehensive enough to be worthy of inclusion (prickly sculpin).
63. Re. tabular WQS and content: User requested an ability to query by multiple species
64. Re. tabular WQS and content: We should better explain the process by which data is fed into StreamNet, georeferenced, standardized, etc. Even frequent users often seemed unaware of how data flows into our database. If the full scope of what is entailed were better understood, users may be more understanding limitations.
65. Re. tabular WQS and content: USFS biologist expressed an interest in Habitat restoration data. She indicated that the USFS continues to submit their data to IRDA. She would like to be able to identify existing/past restoration projects along with all fish data available within a HUC5.
66. Provide a "Build a Download" feature: By form, allow multiple specifications (multiple species, locations, HUCs, etc.) then hit "build download" to create a large spreadsheet of all of the specified data. No need to try to display the data

67. Check for Barriers that are dams but that are not in the Dams table. Even if these are too small to normally be included in the list of Dam Facilities, if we know they are barriers, we should get the basic information on them and include it.