National Marine Fisheries Service Contract for Expansion of StreamNet Database

Status Report Number 1

Submitted By
Pacific States Marine Fisheries Commission

February 4, 1997

The following report will briefly summarize our progress to date on processing and incorporating data into the StreamNet database from the NMFS data files as part of PSMFC's contract entitled *Expansion of StreamNet Database to all Anadromous Salmonid Populations in the States of California, Idaho, Oregon, and Washington.* We have focused on task 1 to this date (expand various databases). Therefore, this report only reflects progress on Task 1.

Task 1: Expand StreamNet abundance, hatchery, and harvest databases

Sub-Task 1A: Expand StreamNet Abundance Database

Status: All 39 files containing abundance data included in the contract have been pre-processed. Data from NMFS files has been re-formatted to meet StreamNet data standards and cross checked with existing StreamNet data trends. 4 categories of NMFS data trends were identified; 1) those trends already included in StreamNet where data values and year ranges were the same, 2) those trends already in StreamNet where data values and year ranges were NOT the same, 3) those trends that were NOT in StreamNet at all, and finally, 4) those trends previously included in StreamNet (and NMFS) that StreamNet no longer carries. Different actions have been taken for each category. For category 1 no action is necessary, for category 2 we have printed reports from both sources and will correct and/or update the StreamNet database to include the most reliable data, for category 3 we have printed reports and will add these trends if, upon examination, the source documentation appears reliable and our State contacts deem the addition appropriate. Category 4 trends will not be reviewed in detail as these trends have already been deemed either not reliable, or duplicative of other data trends in the database. Individual processing of files varies somewhat by State:

California : NMFS data files contained approximately 140 abundance trends. Of these, 57 are new trends not currently in StreamNet. We have not established an 'official' liaison at CDFG at this time to assist us with reviewing this data. We will do so in the near future.

Idaho : NMFS data files contained very few new, or updated abundance trends. IDFG StreamNet personnel will be consulted to review those that do exist and recommend a strategy for incorporation if appropriate.

Oregon : NMFS data files contained 960 trends for various species in Oregon. Of these, approximately 400 are 'new' trends currently not in the StreamNet database (most in the Oregon coastal area). We have met with ODFW staff and they have agreed to have staff at PSMFC process the new information and update the database. Upon our receipt of the reference material for this data, we anticipate completion of this task within 2-3 weeks.

Washington: NMFS data files contained nearly 1,500 trends for various species in Washington. Of these, approximately 600 are 'new' trends currently not in the

StreamNet database (most in Puget Sound and coastal areas). We have met with WDFW StreamNet staff and they have agreed review these trends and incorporate as appropriate. Initially, Washington will review Columbia Basin salmon trends and statewide steelhead trends. Puget Sound and Coastal salmon trends will be reviewed at a later date (pending a March timeline decision by WDFW staff).

Sub-Task 1B: Expand StreamNet Hatchery Database

Status: All 14 files containing hatchery data included in the contract have been pre-processed into 2 consistent databases; hatchery releases and hatchery returns. Data from NMFS files has been re-formatted to meet StreamNet data standards and cross checked with existing StreamNet data trends.

Hatchery Releases: The database submitted to PSMFC from the NRC consultants contains nearly 112,000 records for the states or OR, ID, WA, and CA. About 27% of these records came from PSMFC's CWT database which is the primary source for hatchery release data in StreamNet. Therefore, we are focusing our efforts on 'non PSMFC' data sources for this contract effort (since we already have updated release data from the CWT database). The table below summarizes the number of records (nearly 82,000) from 'non PSMFC' sources in the NMFS database.

# of Records	Reference	RefID
26770	Washington Department of Fish and Wildlife. Historical Planting Database. 1952-Present. Historical releases of juvenile salmon into Washington waters. Includes all reported WDFW, Tribal, WDFW-Cooperatives, Regional Enhancement Groups, and federal plants. Interactive program on WDFW Prime computer. Also called History database for years 1967-present. Contact: Mark Kimbel, WDFW.	8
3	Borgerson, L. A., N. E. Stewart, K. K. Jones, and S. R. Mamoyac. 1991. Yaquina river basin fish management plan. Oregon Department of Fish and Wildlife. 121p.	9
1947	Wallis, J. 1960-1964. Evaluations of Oregon State Fish Commission hatcheries. Data extracted from reports published for each hatchery (Alsea River, Bonneville, Coos River, North Santiam River, Sandy River, McKenzie River, Big Creek, Trask River, Nehalem River, Klaskanine River, Metolius River, Oxbow, Willamette River, Siletz River), e.g., "An evaluation of the Coos salmon hatchery". Oregon Fish Commission Research Laboratory, Clackamas, Oregon.	10
297	Washington Department of Fisheries. 1950-1952. Annual reports of the Washington Department of Fisheries, Olympia, Washington.	12
2	Koski, R.O.. 1947-1977. Stocking of trout and salmon by watershed, 1947-1972. Annual reports of the Oregon State Game Commission. Reports provided by J. Leppink, Oregon Department of Fish and Wildlife, Portland OR.	13
231	U.S. Fish and Wildlife Service. 1950-1977. Annual reports of the Quilcene National Fish Hatchery, Quilcene, WA. Reports provided by T. Kane, U.S. Fish and Wildlife Service, Olympia, WA.	14
11	U.S. Fish and Wildlife Service. 1969-1991. Annual reports of the Quinault National Fish Hatchery, Neilton, WA. Reports provided by T. Kane, U.S. Fish and Wildlife Service, Olympia, WA.	15
680	Pastor, S. 1994. Electronic database of U.S. Fish and Wildlife Service hatchery releases and adult returns in the Columbia River basin, 1960s to 1980s. U.S. Fish and Wildlife Service, Vancouver, WA.	16
68	Fish Passage Center. 1995. Hatchery release database, 1985-1994. Electronic database of hatchery fish releases above Bonneville Dam on the Columbia River. Incomplete data 1979-1984. Data provided by M. Lim, Fish Passage Center, Portland, OR.	17
8	Leith, D. 1995. Chum salmon records for the Abernathy Creek spawning channel (brood years 1959-1966). Abernathy Salmon Culture Technology Center, U.S. Fish and Wildlife Service. Personnel communication.	18
2	Johnson, G. 1994. Summary of activities at Abernathy Creek eggbox. Memorandum to D. Leith, Abernathy Salmon Culture Technology Center, U.S. Fish and Wildlife Service. Habitat Program, Washington State Department of Fish and Wildlife, Olympia, WA.	19
3546	Oregon State Fish Commission. 1947-1967. Fish liberation records for Fish Commission hatcheries, 1947-1977. Data provided by J. Leppink, Oregon Department of Fish and	20

	Wildlife, Portland, OR.	
281	Oregon State Fish Commission. 1947-1967. Fish stocking records for Fish Commission hatcheries, 1947-1977. Records provided by J. Leppink, Oregon Department of Fish and Wildlife, Portland, OR.	21
9886	Oregon State Game Commission. 1949-1976. Cumulative stocking records by watershed, 1949-1976. Data provided by J. Leppink, Oregon Department of Fish and Wildlife, Portland, OR.	22
86	U.S. Fish and Wildlife Service. 1959. Columbia River Fishery Development Program: Hatchery production and distribution data through fiscal year 1959. U.S. Fish and Wildlife Service, Bureau of Commercial Fisheries. Portland, OR.	23
1695	Oregon State Fish Commission. 1964-1977. Fish liberation summaries by brood year, 1964-1977. Records provided by J. Leppink, Oregon Department of Fish and Wildlife, Portland, OR.	24
10720	Oregon Department of Fish and Wildlife. 1978-1994. Egg and Fry Reports. Database of egg, fry, and fingerling release data and spawn information, 1978-1994. Electronic data provided by J. Leppink, Oregon Department of Fish and Wildlife, Portland, OR.	25
130	Kimmerich, J. 1945. A review of the artificial propagation and transportation of the sockeye salmon of the Puget Sound area in the state of Washington conducted by the federal government from 1896 to 1945. U.S. Fish and Wildlife Service, Leavenworth, WA. 144 p.	26
53	Mullan, J.W. 1986. Determinants of sockeye salmon abundance in the Columbia River, 1880s-1982: a review and synthesis. Biological Report 86(12). Fish and Wildlife Service, U.S. Department of the Interior. 136 p.	27
339	Kelly, B. 1995. Salmon release and spawning data for Leavenworth, Entiat, and Winthrop National Fish Hatcheries. Fish and Wildlife Service, U.S. Department of the Interior. Leavenworth, WA. (electronic and hard copy data)	28
1611	Elms-Cockrum, T. and S. Clark. 1995. Salmon release data for Idaho state hatcheries, 1940-1994. Electronic data for years after 1968, except sockeye salmon. Hard copy data for years 1940-1967. Idaho Fish and Game. Boise, ID.	29
50	Feldman, C. 1995. Sockeye salmon data for the artificial spawning beaches at Baker Lake, WA. Environmental Department, Puget Power. Bellevue, WA.	30
33	Kane, T. 1994. Electronic database (dbf format) of salmon liberations and adult returns to the Quinault, Quilcene, and Makah National Fish Hatcheries. USFWS. Olympia, WA.	32
87	Mullan, J.W. 1984. Overview of artificial and natural propagation of coho salmon (Onchorhynchus kisutch) on the mid-Columbia River. Report No. FRI/FAO-84-4. Fish and Wildlife Service, U.S. Department of the Interior. Leavenworth, WA. 37Êp.	33
87	Wahle, R.J., W.D. Parente, P.J. Jurich, and R.R. Vreeland. 1975. Releases of anadromous salmon and trout from Pacific coast rearing facilities, 1960 to 1973. NMFS Data Report 101. National Marine Fisheries Service. Seattle, WA. 443 p.	34
3219	California Department of Fish and Game. 1955-1994. Annual reports of the California Department of Fish and Game facilities that propagate salmon. Reports provided by H. Reading, Inland Fisheries Division, Sacramento, CA. (Facilities include: Mokelumne River Fish Installation, 1964-94; Iron Gate Salmon and Steelhead Hatchery, 1965-94; Mad River Salmon and Steelhead Hatchery, 1970-94; Van Arsdale Fisheries Station, 1977-94; Warm Springs Salmon and Steelhead Hatchery, 1980-94; Trinity River Salmon and Steelhead Hatchery, 1958-1994; Hollow Tree Creek Egg Taking Station, 1979-1982; Noyo River Egg Collecting Station, 1977-1994; Nimbus Salmon and Steelhead Hatchery, 1955-94; Merced River Salmon Spawning Channel and Yearling Rearing Pond, 1971-94; Feather River Hatchery, 1963-92).	35
244	California Department of Fish and Game. 1984-1993. Annual reports of the operations of non-state cooperative salmon and steelhead artificial propagation programs, 1984-93. Reports provided by H. Reading, Inland Fisheries Division, Sacramento, CA.	36
1646	Oregon Department of Fish and Wildlife. 1995. Anadromous Adult Transactions. Database of adult returns and disposition, return years 1983-1993. Data provided by J. Leppink and C. Phillips, Oregon Department of Fish and Wildlife, Portland, OR.	43
96	Mullan, J.W. 1987. Status and propagation of chinook salmon in the mid-Columbia River through 1985. Biological Report 87(3). Fish and Wildlife Service, U.S. Department of the Interior. 111 p.	51
1305	Holsinger, L. 1995. Unpublished electronic database of fall-run chinook salmon released from California Department of Fish and Game hatcheries in the Central Valley, California. National Marine Fisheries Service. Southwest Region. Santa Rosa, CA.	52
221	U.S. Fish and Wildlife Service. 1971-1984. Annual reports of the Tehama-Colusa Fish Facility, Red Bluff, CA. Reports provided by S. Hamelberg, U.S. Fish and Wildlife Service. Northern Central Vally Fishery Resouce Office. Red Bluff, CA.	53
123	U.S. Fish and Wildlife Service. 1943-1965. Annual reports of the Coleman National Fish Hatchery. Fish distribution tables within reports provided by S. Hamelberg, U.S. Fish and Wildlife Service. Northern Central Valley Fishery Resouce Office. Red Bluff, CA.	54
134	Hamelberg, S. 1995. Tables of annual chinook salmon and steelhead trout production at the Coleman National Fish Hatchery, 1943-1994. U.S. Fish and Wildlife Service. Northern Central Valley Fishery Resouce Office. Red Bluff, CA.	55
9300	Washington Department of Fish and Wildlife. 1995. Electronic database of steelhead and cutthroat trout releases in Washington State, 1982-1994. Database provided by M. Kimbel, WDFW, Olympia, WA.	56
6855	Washington Department of Game. 1981. Game fish plants prior to 1988. Microfiche cards provided by M. Kimbel, WDFW, Olympia, WA.	57
8	Johnson, K. 1995. Spawning data for Redfish Lake sockeye salmon. Eagle Fish Facility. Idaho Department of Fish and Game.	82
8		88

It is our initial finding that there are substantial discrepancies between those releases reported by the CWT database (from PSMFC) and releases for the same time period from the NMFS database. Evaluating why all of these differences occur and rectifying them within the scope of this contract will be difficult (if not impossible) due to the magnitude of the differences and the lack of a common set of printed or 'truthed' documents describing these releases. Nearly all of the releases in the NMFS database were cited from references described as 'electronic databases' with little other supporting documentation. Furthermore, the NMFS contractor mixed references with the release data and, in many cases, cites multiple references for one record in the database making it impossible to determine which fields in the record came from which reference.

The vast majority of the differences are confined to untagged fish (which is predictable because the CWT database does not have complete records of releases of untagged fish even though that is the 'standard' for submitting data to the system) but there are differences as well for tagged fish. The following table shows the average difference between the CWT database and the NMFS database for the years 1980-1993, for releases of all TAGGED species.

State	Avg of (CWT value - NMFS Value) for 80-93	Avg of (diffence divided by CWT value) for 80-93
CA	-25,673	0.87%
ID	-57,258	4.68%
OR	-26,574	7.73%
WA	3,615,286	28.99%

Most states are within in a reasonable degree of error except for the state of Washington where the NMFS database consistently under-reports releases of tagged fish. It is my suspicion that this problem is related somehow to the report of fish as 'transferred' rather than released and could probably be quickly rectified.

Differences in untagged releases are another story. The table below shows the average difference between the CWT database and the NMFS database for the years 1980-1993, for releases of all UNTAGGED species.

State	Avg of (CWT value - NMFS Value) for 80-93	Avg of (diffence divided by CWT value) for 80-93
CA	-45,247,524	179.61%
ID	-3,458,920	33.25%
OR	-14,297,813	22.29%
WA	39,077,113	14.58%

In California this difference is explained by the fact the they have not submitted any untagged releases to the CWT database but for the other states this is not the case.

Differences averaging millions of fish per year obviously need attention. Again, we are unsure of the extent to which we can correct all of these problems within the scope of this contract but following is a state by state proposal of what we will do.

California : Utilize information from the CWT database as the 'official' version of releases for tagged fish. Use data from NMFS files for releases of unmarked, unassociated fish and releases prior to data submitted to CWT database (NMFS data goes back to 1943). Establish liaison with CDFG for verification of data.

Idaho : Utilize information from the CWT database as the 'official' version of releases for tagged and untagged fish from 1975 through the present. Utilize StreamNet staff at IDFG to isolate and correct inconsistencies during this time period. Use data from NMFS files for years prior to 1975 (data goes back to 1940).

Oregon : Utilize information from the CWT database as the 'official' version of releases for tagged and untagged fish from 1975 through the present with the exception of unmarked, unassociated releases prior to 1982. These will be taken from the NMFS files as they have not been submitted to the CWT database. Utilize StreamNet staff at ODFW to isolate and correct inconsistencies during this time period. Use data from NMFS files for any years prior to 1975 (data goes back to 1940).

Washington: Utilize information from the CWT database as the 'official' version of releases for tagged and untagged fish from 1975 through the present with the exception of unmarked, unassociated releases of steelhead for all years. These will be taken from the NMFS files as they have not been submitted to the CWT database. Utilize StreamNet staff at WDFW to isolate and correct inconsistencies during this time period. Use data from NMFS files for any years prior to 1974 (data goes back to 1913).

Hatchery Returns: The database submitted to PSMFC from the NRC consultants contains over 13,000 return records for the states or OR, ID, WA, and CA. We have analyzed these records and grouped them into logical trends (defined as a group of a particular stock returning to a particular hatchery. The table below summarizes the status of these data. As you can see, there are a significant number of trends in the NMFS database that are either missing altogether in StreamNet or missing some years.

STATE	# Trends	StreamNet Status
CA	54	Not in StreamNet
CA	10	Missing Some Years
ID	12	Not in StreamNet
ID	17	Missing Some Years

ID	9	Same as Streamnet
OR	152	Not in StreamNet
OR	66	Missing Some Years
OR	49	Same as Streamnet
WA	247	Not in StreamNet
WA	128	Missing Some Years
WA	34	Same as Streamnet

California : Utilize information from NMFS database and update StreamNet database. Establish liaison with CDFG for verification of data.

Idaho : Utilize StreamNet staff at IDFG and to error check and incorporate data from NMFS database that is missing from StreamNet.

Oregon : Utilize StreamNet staff at ODFW and to error check and incorporate data from NMFS database that is missing from StreamNet.

Washington: Utilize StreamNet staff at WDFW and to error check and incorporate data from NMFS database that is missing from StreamNet.

Sub-Task 1C: Expand StreamNet Harvest Database

Marine : Marine harvest data consists primarily of 11 large data files from various sources. We have reviewed this data and are in the process of setting up meetings with the appropriate harvest managers in Oregon and Washington to determine the best route in incorporating this data. The proposal for future updates would be to acquire this data from the PacFin database.

Freshwater: Freshwater harvest data falls into 3 broad categories: Columbia River mainstem harvest, tributary sport harvest, and tributary tribal harvest. We have reviewed these datasets and will proceed as follows.

Columbia River: We are in the process of setting up meetings with the appropriate harvest managers in Oregon and Washington to determine the most appropriate way to incorporate Columbia River harvest data and anticipate that this will be fairly easily accomplished.

Tributary Sport Harvest: Washington is in the process of updating sport harvest data for the entire state. We anticipate that this will supersede the need to review NMFS files for Washington. Idaho data files for harvest match StreamNet trends one for one and will be updated only. Oregon is in the process of updating sport harvest data for the entire state. We anticipate that this will supersede the need to

review NMFS files for Oregon. All California data for sport harvest was obtained from StreamNet and therefore needs no review.

Treaty Freshwater Harvest: We will review these on a trend by trend basis and add as appropriate.