

TCDS 8901

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PACIFIC SALMON COMMISSION
JOINT TECHNICAL COMMITTEE ON DATA SHARING
JOINT WORKING GROUP ON MARK RECOVERY DATABASES

REPORT TCDS (89) - 1

INFORMATION CONTENT AND DATA STANDARDS
FOR A
COASTWIDE CODED-WIRE TAG DATABASE

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July 12, 1989

Pacific Salmon Commission
Data Sharing Committee
Working Group on Mark Recovery Databases

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Pacific Salmon Commission
Data Sharing Committee
Working Group on Mark Recovery Databases

Preface to Final Report

According to the minutes of the February 18, 1986 meeting of the Data Sharing Committee of the Pacific Salmon Commission:

The coded-wire tag data represents one database which might best be maintained in one database accessible coast wide. The database may be an existing one accepted coast wide or could be a new one developed in a central area. The former option is preferable because the database is available now and the option would be more cost effective. A working group was proposed to evaluate existing systems and to define elements and standards needed in any system before it is accepted as the coast wide database. The working group would:

- determine the status and information content of available databases;
- define information files necessary for use of coded-wire tag data in fisheries management;
- describe limitations to data quality, timeliness of data availability;
- document data codes and file formats;
- describe protocols for use of various systems;
- recommend a preferred system to be adopted coast wide; and project time required before the system could be fully operational.

The Working Group on Mark/Recovery Databases was quickly constituted. The panel consisted of experts in data processing as well as end users of coded-wire tag data. Over a two year period, ten formal bilateral meetings and numerous ad-hoc conferences were held. Eventually, formal representation on the group included Alaska Department of Fish and Game, Canada Department of Fisheries and Oceans, Northwest Indian Fisheries Commission, Oregon Department of Fish and Wildlife, Pacific Marine Fisheries Commission, and Washington Department of Fisheries. Direct participants also included California Department of Fish and Game, Idaho Department of Fish and Game, National Marine Fisheries Service, U.S. Fish and Wildlife Service, and Washington Department of Game.

This document constitutes the final report of the Working Group on Mark Recovery Databases. It is recommended this be approved by the Pacific Salmon Commission and, thereby, become the authorized mechanism for sharing coded-wire tag information within the scope of the Pacific Salmon Treaty.

Pacific Salmon Commission
Data Sharing Committee
Working Group on Mark Recovery Databases

Executive Summary

The report of the Working Group on Mark Recovery Databases is organized into six Sections, corresponding to the group's six Terms of Reference. It is followed by five appendices to Section 4, denoted Appendix 4.1 through Appendix 4.5; and three appendices to Section 6, denoted Appendix 6.1 through Appendix 6.3.

TERM OF REFERENCE #1

All agencies within the jurisdiction of the Pacific Salmon Treaty that originate coded-wire tag (CWT) data submitted reports on data status. This information is tabulated by State, Agency, and Fishery. Within each category are listed both those calendar years having complete data sets and those calendar years which are incomplete. Information content among agencies is, at a broad level, similar; though numerous variations exist at the detail level. These tables are based on the records of the primary originators of the data. This is because the group found no agencies had really authoritative databases of other agencies' CWT data.

TERM OF REFERENCE #2

For organizational purposes, descriptions of necessary files have not been provided in this section. Instead, file descriptions are incorporated into the definition of a comprehensive CWT data structure in Section 4.

TERM OF REFERENCE #3

For each major data provider, tables are shown listing estimated dates information can be made available on computer media in the coast wide standardized form defined in Section 4. The first group of tables details when historical data can be provided. The second group gives estimates of how long after a season newly compiled information can be made available.

TERM OF REFERENCE #4

The existing internal CWT data systems within the PSC jurisdiction are not technically able to meet the major needs of coast wide fisheries managers. Codes, files, formats, as well as other components needed to properly define a suitable coast wide CWT data structure are presented here as a set of recommendations.

A common coast wide data structure, which can be accommodated by all major data originators, is technically defined. A detailed set of rules for validating original data is defined. Data values which have differing shades of meaning among various data providers are defined. A hierarchical location coding scheme, embedded in the coast wide data structure, and providing the capability to pinpoint coast wide locations as well as aggregate data at numerous levels, is explained. The coding structure used to map numerous local fishery designators into a common coast wide set is defined. A need to empanel a standing group to maintain this standardized comprehensive structure is identified.

TERM OF REFERENCE #5

Narrative is provided describing the equipment, organization, and accessibility of existing internal CWT data systems used by individual agencies. There appears very limited commonality beyond asynchronous ASCII communications and 9-track tape exchange facilities. However, three of the five systems described employ DEC VAX equipment which are capable of being networked together at the hardware level.

TERM OF REFERENCE #6

In accord with subsequent direction received from the Commissioners, this term was modified to consider only a preferred system of sharing CWT information which employs separate Canadian and U.S. sites. A description of the recommended system is given. Detailed U.S. and Canadian recommendations, each authored by their corresponding sections within the group, are provided. Significant considerations concerning the operational protocol are suggested.

Pacific Salmon Commission
DATA SHARING COMMITTEE
Working Group on Mark Recovery Databases

Report on Status and Information Content of Available Databases
(TERM OF REFERENCE NUMBER 1)

October 1, 1988

All of the following agencies have databases containing release information for coded-wire tagged groups of fish through the 1987 release year. This table details the status of agency databases containing catch, sample and recovery data pertaining to CWT groups.

State/Province	Agency	Fisheries	Years Completed	Years Incomplete

Alaska	ADFG	Commercial (No Gear)	80-87	78, 79, 88
		Commercial Troll	"	"
		Commercial Seine	"	"
		Commercial Gillnet	"	"
		Commercial Trap	81-87	88
		Cost Recovery	82-87	"
		Test Fishery-Troll	81, 84-87	"
		Test Fishery-Seine	"	"
		Test Fishery-Gillnet	"	"
		Subsistence	84-87	"
		Sport	80-87	"
		Hatchery Esc.	82-87	"
		Spawning Ground Esc.	"	"

	NMFS	L. Pt. Walt. Seine	79-86	87-88
		Hatchery	79-86	"
		Trap	81-86	"
		Terminal Troll	"	"
		Terminal Sport	"	"
		Terminal Seine	"	"
		High Seas Recoveries	"	"

British Columbia	CDFO	Troll	75-87	88
		Net	"	"
		Sport	"	"
		Hatchery	73-86	"
		Spawning	?	"
		Other	?	?

State/Province	Agency	Fisheries	Years Completed	Years Incomplete
Washington	WDF	Ocean Sport	71-85	86-88
		Ocean Troll	"	"
		Coastal Gillnet	"	"
		Puget Sound Sport	"	"
		Puget Sound Net	"	"
		Col. R. Trib. Net	83-85	(none)
		Hatchery	71-85	86-88
		River Sport	79-85	"
		Stream Trap	"	"
		Spawning Grounds	"	"
		River Snagging	"	"
WDG	WDG	River Sport (Sthd)	(none)	77-88
		Quinault Gillnet	77-86	87-88
		Hatchery	?	?
USFWS	USFWS	Spawning Grounds	81-87	88
		FWS Hatchery	79-87	88
		Tribal Hatchery	81-82	(none)
		Hoh River Sport	83-84	(none)
NWIFC	NWIFC	Tribal Hatchery	(none)	83-88
		Columbia River	NMFS	Juvenile Recapture
				77-83
				(none)

State/Province	Agency	Fisheries	Years Completed	Years Incomplete
Oregon	ODFW	Ocean Sport	77-87	88
		Ocean Troll	"	"
		Col. R. Sport	"	"
		Col. R. Net	"	"
		Williamette Sport	79-87	"
		Col. R. Test	"	"
		Indian Ceremonial	"	"
		Col. R. Shad	79	(none)
		OSU Ocean Seine	80-87	88
		Public Hatchery	84-87	88
		Fish Trap	"	"
		Estuary Sport	"	"
		Private Hatchery	77-86	87-88
		Spawning Grounds	80-87	88
Idaho	IDFG	River Sport	(none)	79-88
		Hatchery	"	"
California	CDFG	Ocean Sport	77-86	87-88
		Ocean Troll	"	"
		Hatchery	(none)	77-88
		Spawning Grounds	(none)	77-88
USFWS	USFWS	Indian Net	(none)	80-88
		Hatchery	79-87	88

Information Files Necessary for Use of Coded-wire
Tag Data In Fisheries Management
(TERM OF REFERENCE NUMBER 2)

Identifying data requirements for CWT analysis was a very complex task. At a superficial level, the needs appear straightforward. Required are catch data, sample data, recovery data, and release data from artificially propagated salmonids. However, the specific types of information carried within files are the basis for fisheries management decisions. Furthermore, the organization of information within the files directly bears on how amenable the information may be for specific types of processing. A detailed list of recommended files and fields within data files is attached in Appendix 4.1.

Describe Limitations to Data Quality,
 Timeliness of Data Availability
 (TERM OF REFERENCE NUMBER 3)

Canada Department of Fisheries and Oceans

Release

Type	Years	Date Available
CWT & Associated (90% of total fish released)	1970-1987	February 12, 1988
Unmarked 3%	1970-1987	February 12, 1988
Remaining 7%	1970-1987	December 31, 1988

Recovery & Catch/Sample

Type	Years	Date Available
Commercial	1973-1974 1975-1986	No data February 12, 1988
Sport	1973-1974 1975-1979* (recoveries only) 1980-1986	No data February 12, 1988 February 12, 1988
Escapement (Hatchery) (River)	1973-1986 1980-1986**	February 12, 1988 February 12, 1988

Notes:

* No sport catch estimates until 1980
 Recoveries use an awareness of .25

** All data but key stream data is available. Key stream data will
 be available 2 weeks after it is received.

Alaska Department of Fish and Game

Release

Type	Years	Date Available
CWT and Associated	1973-1987	December 1988
Unmarked	1973-1987	N/A

Notes

N/A: These data are not currently maintained in computer information systems at ADF&G.

Recovery

Type	Years	Date Available
Commercial Net and Troll	1980-1987	December 1988
	1978-1979	July 1989
Commercial Trap	1981-1987	December 1988
Sport	1980-1987	December 1988
Escapement		
(Hatchery)	1982-1987	December 1988
(Stream)	1982-1987	December 1988
Cost Recovery	1982-1987	December 1988
Test Fisheries	1981, 1984-1987	December 1988
Subsistence	1984-1987	December 1988

Alaska Department of Fish and Game

Catch/Sample

Type	Years	Date Available
Commercial Net and Troll	1980-1987	December 1988
	1978-1979	July 1989
Commercial Trap	1981-1987	December 1988
Sport	1980-1987	N/A
Escapement (Hatchery)	1982-1987	N/A
(Stream)	1982-1987	N/A
Cost Recovery	1982-1987	December 1988
Test Fisheries	1981, 1984-1987	December 1988
Subsistence	1984-1987	N/A

Notes

N/A: Data are not currently available because no random sampling took place and/or catch data is not in computer accessible form.

Oregon Department of Fish and Wildlife**Release**

Type	Years	Date Available
CWT & Associated	1970-1987	February 15, 1988
Unmarked:		
Public	1982-1987	February 15, 1988
Private	1970-1987	February 15, 1988

Recoveries and Catch/Sample

Type	Years	Date Available
All fisheries	1977-1983	April 1, 1988
	1984-1986	July 1, 1988
	1987	December 31, 1988

Washington Department of Fisheries
Proposed Timetables
for Provision of Historical PSC-Formatted Data

Revised: October 4, 1988

Salmon Release Data

Type	Years	Date Available
WDF, Coop, Univ. of Wash.		
* CWT and Associated Releases	1970 - 1987	November, 1988
* Unmarked Releases	1970 - 1987	December, 1988
* All Releases	1988	February, 1989

Washington USFWS and Tribal

* All Data	1970 - 1987	Two weeks after receipt of final data by WDF
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Salmon Catch, Escapement, Sample and Recovery Data

Type	Years	Due Date
Washington commercial and sport catch; Escapement to WDF-sampled streams; WDF and joint WDF-tribal sampling and recoveries.	1984, 85, 86 1987 1983 1982 1981 1979, 80 1978 1977 1976 1988 1975 1974 1973 1971-1972	October, 1988 February, 1989 March April May June July August September October November December January, 1990 March
Escapement to tribal-sampled streams; tribal escapement sampling and recoveries.	1971 - ??	Four weeks after receipt of final data by WDF

Alaska Department of Fish and Game

Exchange of Yearly DataRELEASES:

All CWT marked and associated unmarked releases will be available by January 15 for the preceding year. A schedule for providing non-CWT releases cannot be determined until a data processing system has been established for this purpose.

RECOVERIES:

PRELIMINARY JANUARY: 95% of CWT recoveries are available.

PRELIMINARY MAY: 100% of CWT recoveries are available.

FINAL: By July 1 for the preceding year.

CATCH/SAMPLES:

PRELIMINARY JANUARY: 95% of Catch/Samples are available for the supported fisheries in southeast Alaska. This may drop slightly in future years due to the trend of increased catch in winter fisheries.

PRELIMINARY MAY: 99% of Catch/Samples are available for the supported fisheries in southeast Alaska.

FINAL: By July 1 for the preceding year.

Canada Department of Fisheries and Oceans

Exchange of Yearly DataRELEASES:

All release data marked and unmarked available by January 15, 1988.

RECOVERIES:

PRELIMINARY JANUARY: 80% saltwater recoveries
0% escapement

PRELIMINARY MAY: 95% saltwater recoveries
60% escapement

FINAL: October for preceding year.

CATCH/SAMPLES:

PRELIMINARY JANUARY: 90% of Catch
95% of Samples

PRELIMINARY MAY: 95% of Catch
100% of Samples

FINAL: October for preceding year.

Washington Department of Fisheries

Exchange of Yearly DataRELEASES:

All marked and unmarked available by January 31, 1988.

RECOVERIES:

PRELIMINARY JANUARY: 85% of fishery
0% of escapement

PRELIMINARY MAY: 100% of fishery
75% of escapement

FINAL: October for preceding year.

CATCH/SAMPLES:

PRELIMINARY JANUARY: 75% of catch
0% of returns

PRELIMINARY MAY: 90% of catch
75% of returns

FINAL: October for preceding year.

Oregon Department of Fish and Wildlife

Exchange of Yearly DataRELEASES:

All marked releases by January 15, 1988.
All unmarked releases by June 15, 1988.

RECOVERIES:

PRELIMINARY JANUARY: 90% Ocean and Columbia
70% Escapement

PRELIMINARY MAY: 95% all Fisheries

FINAL: September for preceding year.

Idaho Department of Fish and Game

Provision of Historical PSC-Formatted CWT DataI. Release Data

- A. CWT & Associated: 1976 - 1986: October - November, 1988
B. Unmarked: 1976 - 1988: early 1989

Note: IDFG computerizing hatchery unmarked releases
but project long way from completion.

II. Recovery Data (1973 - 1986)

River Sport
Hatchery calendar year 1989
Spawning Surveys

III. Catch/Sample Data

Same as for Recovery Data

California Department of Fish and Game

Provision of Historical PSC-Formatted CWT DataI. Release Data

- A. CWT & Associated: 1976 - 1986 period: calendar year 1988
(* Data starts in 1976)
- B. Unmarked: 1976 - 1986 period: calendar year 1990
pre-1976 period: unknown, some data lost

Note: CDFG's hatchery system now moving to computerized database; conversion expected to take two years.

II. Recovery Data

- A. Ocean Fisheries (Commercial and Sport)
 - 1. current: July, 1988
 - 2. 1978 - 86: July, 1989
 - 3. Pre - 1978: not on computer
- B. Inland Fisheries (includes Hatchery, Sport, Spawning Ground)
 - 1. current: July, 1988
 - 2. 1978 - 86: July (?), 1989

III. Catch/Sample Data

Same schedule as for Recovery Data

Document Data Codes and File Formats
(TERM OF REFERENCE NUMBER 4)

The Working Group on Mark/Recovery Databases offers the following recommendations to the Data Sharing Committee for Data Codes and File Formats needed to implement a coast wide coded-wire tag management data system.

TEST SET

In the process of developing detailed codes and formats, the Working Group employed a test set of actual coast wide coded-wire tag data. The major agencies made earnest efforts to put their internal data into the recommended forms. The resulting data sets were scrutinized by computers in Canada and the U.S. Formats and codes were then revised to resolve discovered difficulties.

Specific data employed were Recoveries and Catch/Samples for the full calendar year of 1984. Release information covered all coded-wire tag releases made through 1984. Certain agencies also included non-CWT hatchery release information in their Release file, though not every agency was in a position to do this during the test period.

RECOMMENDATION: ADOPT "PSC STANDARD CWT FORMAT VERSION 1.2" AS THE REQUIRED CODES AND FORMATS FOR COAST WIDE SHARING OF CODED-WIRE TAG INFORMATION FOR PSC RELATED PURPOSES

PSC Standard CWT Format Version 1.2 is defined in Appendix 4.1 to this report. It is the most recent technical definition of codes and formats developed by the Working Group. Files are defined for CWT Individual Recoveries, CWT Catch and Sample Information, Hatchery Releases (both CWT-represented and non-represented), and Coast Wide Location Definitions. Each file has numerous fields exactly defined on it. Furthermore, standard computer media to be used for information exchange are specified.

RECOMMENDATION: ADOPT "PSC STANDARD CWT VALIDATION VERSION 1.2" AS THE REQUIRED CRITERIA FOR ACCEPTING CODED-WIRE TAG INFORMATION FOR PSC RELATED PURPOSES

PSC Standard CWT Validation Version 1.2 is defined in Appendix 4.2 to this report. It is the most recent technical definition of permissible values for all the fields defined by PSC Standard Format Version 1.2. After reviewing previous attempts to collect coast wide data from disparate agencies, enforcement of these criteria are judged essential to the maintenance of coast wide data integrity.

RECOMMENDATION: ADOPT "DETAIL DEFINITIONS VERSION 1.2" AS THE STANDARD REFERENCE FOR CERTAIN CODES WHOSE MEANINGS VARY AMONG AGENCIES

Detail Definitions Version 1.2 is defined in Appendix 4.3 to this report. It describes actual meaning of values used in encoding certain fields by various agencies. Although it is desirable to have a single specific meaning for every code, it was not judged practical to enforce this across all agencies coast wide. The authority of PSC members does not clearly extend into forcing specific nomenclature and methodology for measuring and classifying events reported on the exchanged data sets. Also, the large volume of historic data already collected generally cannot be fitted a posteriori with altered data meanings.

Except where specific local usage is recorded in the Detail Definitions, the global definitions recorded in PSC Standard Format 1.2 apply to all data.

RECOMMENDATION: ADOPT "LOCATION CODING SCHEMES" AS THE STANDARD REFERENCE FOR DETERMINING PHYSICAL LOCATION OF GEOGRAPHIC VALUES COAST WIDE

Location Coding Schemes are defined in Appendix 4.4 to this report. PSC Standard CWT Format 1.2 defines six different fields that specify geographic locations for various purposes such as Release Site and Stock of origin. A hierarchical scheme has been used to uniquely define locations anywhere within the jurisdiction of the Pacific Salmon Commission. Furthermore, this scheme allows aggregation of detailed information at several geographic levels. A cross-reference computer file is recommended as one of the four files in the format document, and this can be used to automatically translate between the hierarchical area codes and common names. The Location Coding Schemes explain the method for defining hierarchical codes coast wide.

RECOMMENDATION: ADOPT "STANDARD FISHERY CODING VERSION 1.2" AS THE STANDARD REFERENCE FOR NAMING INDIVIDUAL FISHERIES COAST WIDE

Standard Fishery Coding Version 1.2 is defined in Appendix 4.5 to this document. Due to the large number of individual fisheries identified coast wide, the coding scheme for them is supplied as a separate document. The document identifies standard codes and provides a cross-reference for mapping disparate local agency codes into the standard codes.

RECOMMENDATION: ESTABLISH A PERMANENT WORKING GROUP ON TECHNICAL DATA SHARING CODES AND FORMATS

The purposes of end users of CWT data and the methodologies they employ are constantly being refined. Furthermore, the data collection process changes periodically due to funding and technological factors. In the process of determining the best codes and formats for coast wide data sharing, and in testing their efficacy, it became apparent that the codes and formats will need regular coordinated updating.

It is recommended that a permanent working group on technical data sharing codes and formats be established to perform the periodic updating. The charge of this group should be specifically limited to the technical process of maintaining the details of coding and formatting data for coast wide use, and to maintaining, where possible, consistent use of codes and formats when exchange of additional data sets is undertaken. It should not be within their scope to set policy, though they would be a suitable source of technical information for policy makers.

Describe Protocols for Use of Various Systems
(TERM OF REFERENCE NUMBER 5)

Alaska Department of Fish and Game Coded Wire Tag Processing

At ADF&G, CWT information is maintained at two distributed physical locations. While both locations access identical CWT databases, the user orientations differ. For purposes of this description, the two systems will be referred to as 'System A' and 'System B'.

System A is physically located at the ADF&G Tag Lab in Juneau. The host computer is a Honeywell Ultimate model 6600 minicomputer running the Pick operating environment. The site is dedicated exclusively to CWT data management using software developed in-house that is written in the Pick proprietary languages. User access is exclusively in timesharing mode through hardwired terminals, PCs in terminal emulation, and asynchronous dialups. All coded wire tag Catch, Sampling, and Release information is updated at System A exclusively. This site also provides raw and summary data in a variety of media upon request. Media include hardcopy reports, 9-track tape, and 5-1/4 inch PC diskettes in such forms as Lotus spreadsheets, dBase files, and word-processing documents. The content and format of reports is quite flexible, with capability to select, sort, display and sum on any and all fields in the database. Dialup users may also extract and download data to their PCs. This last feature, however, is command driven: users must have prior training in the fourth generation inquiry language.

System B is located at the Southeast Region office in Douglas. The host computer is a DEC MicroVAX II supermicro running VMS with an integral Ultimate Pick co-processor and a closely coupled network of personal computers. The site is used by management and research staff for data analysis. The Pick partition contains the complete System A; with data values updated directly from System A. The VMS segment supports FORTRAN, SAS, SAS Graph, and the IMSL statistical library. Every user has an IBM-compatible PC with a vast complement of commercial software. All PCs are coupled to the VAX using Ethernet hardware and Mobius software. The computer interface permits two access methods: the user may log on to the VAX/ULTIMATE as a terminal to work in VMS and Pick or, alternatively, may execute PC software which transparently accesses the VAX data files as if they were stored on the PC. CWT analysis is primarily performed by selecting the data of interest and manipulating it with the user's preferred PC tools.

Contact Bill Johnson. (907) 465-3483 Juneau AK

CANADIAN DEPARTMENT OF FISHERIES AND OCEANS

MARK RECOVERY DATA BASE

LOCATED: PACIFIC BIOLOGICAL STATION, NANAIMO BC

HARDWARE: DIGITAL VAX SYSTEM

OPERATING SYSTEM: VMS

REMOTE ACCESS CAPABILITIES: DATAPAC NETWORK X29 (9600)

DIRECT DIAL UP (300/1200/2400)

USER INTERFACE/SOFTWARE:

\$MRP invokes an extensive set of menu driven applications. The menus are fully supported with online Help. Detailed documentation is being prepared for publication. Options available through the menu include Release reports, Production reports, Catch reports, and Data dumps. User may also use menu to extract subsets of the MRP data base into flatfile formats suitable for downloading to other computers, and for input to other packages.

The MRP database can also be accessed via user written Fortran programs. Library subroutines exist to handle data access, so that users need not know file structure or location. Detailed documentation of these routines and examples of their use is in publication.

SUPPORT: The MRP database is managed by the Salmon Stock Assessment group at the Pacific Biological Station. Requests for data, computer access, and queries about the system and data, are handled by this group.

Contact Louis Lapi (604) 756-7144 Nanaimo BC.

Washington Department of Fisheries

Coded-wire tag related data are maintained by WDF staff on two separate computer systems. The first system was implemented in the late 1970's and is available for public use. The second system is for the use of WDF employees only, and is currently under development.

The types of CWT data available on these systems include coast wide CWT group release data, catch and sampling data, and recovery data from the early 1970's through the present.

SYSTEM 1:

The publicly available system of CWT related data is installed on the University of Washington's CYBER mainframe computer, located in Seattle WA. The computer is a CYBER model 180/855 running the CDC NOS and NOS/VE (Virtual Environment) operating systems. This mainframe features 8 gigabytes of online storage, support for up to 4 200-megabyte disk packs, and extensive support for magnetic tape reading, writing and storage. The recovery data system established by WDF is a series of sequential data files organized by brood year and species. These files are accessed by FORTRAN programs and a series of Cyber Control Language procedures that extract and summarize the data from disk pack upon request. The release and catch/sample files are archived on magnetic tapes and are also available upon request. At present, there is no online retrieval capability for these files.

SYSTEM 2:

The "inhouse" system under development for WDF staff usage is targeted for the agency's Prime 9755, which is located in the Olympia, WA headquarters office. The Prime runs the PRIMOS operating system (version 20.2.2) and has 1.2 gigabytes of online storage, support for one dismountable disk pack, and a single magnetic tape drive used for system backup and occasional tape file import or export. Users are not encouraged to utilize the tape facility for everyday needs. The system itself is embryonic at the point, but will probably involve the loading of CWT related data into MIDAS (Multiple Indexed Direct Access Storage) files and the construction of a retrieval and storage system either in a DBMS language (e.g. QUEO) or in FORTRAN.

Contact Dick O'Connor (206) 586-2130 Olympia WA

OREGON DEPARTMENT OF FISH AND WILDLIFE
INFORMATION SYSTEMS

A. EVOLUTION:

The two Evolution computers housed in the Data Processing section of ODFW will, for identification purposes, be called System A and System B. The configuration of System A is: 200 MB disk storage, 512K MOS Memory, one NCR cash register, and two 300 LPM printers. The configuration of System B is: 200 MB disk storage, 256K MOS Memory, one card embosser, and one 300 LPM printer. Each system also has a dual-density 800/1600 BPI 45 IPS tape drive, release R82, and a battery backup system. Peripheral equipment which can be used on either system is 88 CRT terminals, six printing terminals (may also be used as serial printers) and two high-quality printing terminals (one with a sheet feeder). Peripheral equipment independent of the computers are: one Uarco burster, one Tab decollator, and one IBM 129 keypunch. There are also two Micom Multiplexors to connect Newport to System B and six modems to connect remote terminals to Systems A and B (i.e. Clackamas Lab).

B. BURROUGHS:

The configuration of the Burroughs B1990 system is as follows: Single processor system B-1990, 2MB Main Memory, Card Reader Control, 600 CPM, two (2) 600 Line Printers (64CHR), two (2) 542MB Disk Drives, MTU Control PE, 80KB PE MTU/lx4 MEC (2), Expansion cabinet, Expansion kit, I/O Extension, DSC Extension, Quad line adapters (2), Matrix printer RS232/TDI, B9246-6 with ODEC INTFCBAC, Printer control 7B, 252MB Disk Pack Drive, Disk sub-system control and 44 CRT terminals.

Also added to the inventory of DP equipment were two IBM CRT's and two IBM printers that connect remotely to the Salem Executive Dept computer. One CRT and one printer is located in the DP section and is used jointly by DP staff and business to access files and run programs for Licensing, Accounting, Fiscal and Budget Units. The second CRT and printer are located in the Personnel section and are used by their staff to handle personnel functions now required.

- Applications:
- Mark Recovery
 - Commercial Fish Landing Data
 - Fish Liberation
 - Hatchery Management
 - Salmon/Steelhead Sport Tags
 - Ocean Salmon Sport Catch
 - Columbia River Commercial Fishery Data Base

Contact Charlie Corrarino (503) 229-5331 Portland OR

Pacific Marine Fisheries Commission

Data Site: Regional Mark Processing Center
 Portland Center Plaza
 2075 S.W. First Avenue, Suite 1-C
 Portland, Oregon 97201

Data Manager: J. Kenneth Johnson
Computer Specialist: James R Longwill
 Tel: (503) 294-7474

I. Description of Computer System

PMFC's Regional Mark Processing Center maintains a coast wide database for all CWT releases, recoveries, and associated catch/sample data on a DEC MicroVAX II mini-computer. The system utilizes a PICK operating system by Ultimate Corp. which runs co-resident with the native VAX/VMS operating system. Specifics of the system include 16 MB of main memory, 1,009 MB of disk memory (unformatted), 16 ports, one 1600-3200 bpi tape drive, one 1600 -3200-6250 bpi tape drive, an 8 mm 2.3 gigabyte tape backup subsystem, and four modems (see below) for public access to the database.

II. Description of the CWT Data Sets

A. PMFC Format

The RMPC's CWT release data file includes all releases from 1969 through the present. New release groups are added as preliminary data in mid- year and then finalized at the beginning of the next year.

The summary files of CWT recovery data (and associated catch/sample data) presently span years 1977-1987 for U.S. fisheries and years 1975-1987 for Canadian fisheries. Specific data sets available for each recovery agency are provided in Section 1 of this report.

Tag recovery data are available from the RMPC either through hard copy data reports by request or by on-line data retrieval. In either case, tag recoveries are summarized by tag code across all fisheries. The user has the option of selecting the year or years of interest. In addition, the reporting time period options are either: a) Statistical two week periods, b) Calendar month, or c) Annual Summary.

Both finalized and preliminary data are included together and identified in all available summary reports.

B. PSC Format

The RMPC is currently developing the necessary software to implement the new PSC formats for CWT releases, recoveries, catch/sample data, and location codes. To date, software has been largely completed for tape loading, data verification and validation, and tape writing in the new PSC formats. Work is continuing on the development of an on-line data retrieval system that will give users expanded options for obtaining desired data.

III. Communication Information

A. Host Computer

DEC MicroVAX II minicomputer
PICK operating system (co-resident with VAX/VMS)

B. Communication Format

ASCII (Asynchronous)
Parity: None
Data Bits: Eight
Stop Bits: One
Handshake: X-ON/X-OFF

C. Modems (three baud rate options)

- 1) 1200 Baud: Telephone (503) 294-7501
- 2) 1200 Baud: " (503) 294-7502
- 3) 2400 Baud: " (503) 294-7790
- 4) 19200 Baud: " (503) 294-7791

Recommend A Preferred System to be Adopted Coast wide
Project Time Required Before The System Could Be Fully Operational

(TERM OF REFERENCE NUMBER 6)

1. RECOMMEND A PREFERRED [MANAGEMENT DATA] SYSTEM TO BE ADOPTED COAST WIDE

In this context a "management data system" is construed as a system that makes available to all PSC participants information in a uniform format and of a uniform version of currency that is necessary for formulating fisheries management decisions.

The Working Group on Mark/Recovery Databases recommends a coded-wire tag management data system as follows:

- A. A single central exchange point is to be established for the U.S. The recommended implementation of this central exchange point is defined in Appendix 6.1 to this report.
- B. A single central exchange point is to be established for Canada. The recommended implementation of this central exchange point is defined in Appendix 6.2 to this report.
- C. The U.S. central exchange point acquires CWT data that originates in the U.S. Data must be of a form that can meet the specifications in Section 4 of this report.
- D. The Canadian central exchange point acquires CWT data that originates in Canada. Data must be of a form that can meet the specifications in Section 4 of this report.
- E. The central exchange points shall each house a single copy of the complete PSC Coded-Wire Tag Data set, which meets the specifications defined in Section 4 of this report and is recognized as the authoritative data set for PSC coded-wire tag analysis. They perform regular data management, update, documentation, and auditing processes to ensure all data submissions are accurately reflected in their copy of the PSC Coded-Wire Tag Data set. The central exchange points, during the process of revising their copies of the PSC Coded-Wire Tag Data set, communicate all changes between themselves in such a manner that both copies of the PSC Coded-Wire Tag Data set contain the same information. A suggested protocol for this process is contained in Appendix 6.3 to this report.
- F. The U.S. central exchange point provides access to information contained in the PSC Coded-Wire Tag Data set in a manner that satisfies the needs of users within the U.S.
- G. The Canadian central exchange point provides access to information contained in the PSC Coded-Wire Tag Data set in a manner that satisfies the needs of users within Canada.

2. PROJECT TIME REQUIRED BEFORE THE SYSTEM COULD BE FULLY OPERATIONAL

The Canada central exchange point is currently operational. The U.S. central exchange point is projected to be operational December 1, 1988. The subsidiary providers of basic information to the central exchange points project availability of specific segments of coded-wire tag data according to the schedule presented in Section 3 of this report.

APPENDIX 4.1

Specifications for Reporting Salmonid
Production and CWT Data

Pacific Salmon Commission

Format Version 1.2
12 May 1988

I. Magnetic Media

A. Disk: 360KB or 1.2 MB density

B. Tape: 1600 bpi

1. ASCII
2. Blocked (see specifications below)
3. Unlabelled

II. File Block Lengths

A. Release Data File

1. Record length: 220
2. Block length: 8140 (37 records/block)

B. CWT Recovery Data File

1. Record length: 91
2. Block length: 8190 (90 records/block)

C. Catch and Sample Data File

1. Record length: 106
2. Block length: 8162 (77 records/block)

D. Location Code File

1. Record length: 132
2. Block Length: 8184 (62 records/block)

SALMONIDS DATA ELEMENTS
PSC FORMAT - Version 1.2

PSC Working Group on Mark/Recovery Databases

May 12, 1988

I. RELEASE DATA

<u>Datum</u>	<u>Columns</u>	<u>Justi-</u>	<u>Needed</u>	<u>fication</u>	<u>Format</u>	<u>Explanation</u>
1. Release Group (Tagged or Untagged) (Cols. 1-12)						
a. Tag Code	12	L	AAD1D2D3D4			Cols. 1-2: Agency Cols. 3-4: Data 1 Cols. 5-6: Data 2 Cols. 7-12: D3D4 Available for future use; *Color coded tags and Rare Earth tags reported in Alpha only
OR						
b. Release Identifier	12		Alpha-Numeric			Unique ID required to identify all hatchery release groups NOT represented by CWTs
	(Byte 1)			'!'		Flag used for identifying unmarked groups
	(Bytes 2-3)			See Field 20		Tag Coordinator code; Right justified and Zero filled
	(Bytes 4-12)					Agency defined unique code; No embedded blanks
Comments: The PSC data base discourages multiple uses of a tag code! It is likely that policies will be set in the future resulting in rejection of such data.						
2. Number of Replicates	2	R	Numeric			Highest replicate code
				Range:		Replicates must be consecutive; Origin = 01; Zero filled
				01-07		

<u>Datum</u>	<u>Columns</u>	<u>Justi-</u>	<u>Needed</u>	<u>fications</u>	<u>Format</u>	<u>Explanation</u>
3. Tag Type (Cols. 15-16)	2	R	Numeric		Blank Filled	
				'0'	= Standard Binary (1mm)	
				'1'	= Half Tags (H Type)	
				'2'	= Half Tags (B Types)	
				'3'	= 6 Word Half Length tags	
				'4'	= Xray Binary	
				'5'	= Standard Color	
				'6'	= Solid Color (##)	
				'7'	= Striped Color (\$\$)	
				'8'	= Rare Earth	
				'9'	= Embedded Replicate	
4. Species (Col. 17)	1			'1'	= Chinook	
				'2'	= Coho	
				'3'	= Steelhead	
				'4'	= Sockeye	
				'5'	= Chum	
				'6'	= Pink	
				'7'	= Masu	
				'8'	= Cutthroat	
5. Run (Col. 18)	1			'1'	= Spring	
				'2'	= Summer	
				'3'	= Fall (includes Type S Coho)	
				'4'	= Winter	
				'5'	= Hybrid	
				'6'	= Landlocked	
				'7'	= Late Fall (includes Type N Coho)	
6. Brood Year (Col. 19-20)	2		Numeric		Last two digits of calendar year when majority of run returns to spawn; If more than one brood present (i.e. wild tagging), then use dominant brood and report mixed stock tagging in comment field.	
7. Release Agency (Cols. 21-24)	4	L	Alpha		Abbreviations provided in CWT Release Report	

<u>Datum</u>	<u>Columns Needed</u>	<u>Justification</u>	<u>Format</u>	<u>Explanation</u>
8. Release Site (Cols. 25-43)	19		Alpha-Numeric	Hierachial coding scheme to pinpoint actual site
a. Level 0	(1)			State or Province '1' = Alaska '2' = British Columbia '3' = Washington '4' = Idaho '5' = Oregon '6' = California '7' = High Seas
b. Level 1	(1)		'M' 'F'	Water Type = Marine = Freshwater
c. Level 2	(1)		Alpha-Numeric	Sector (Special case: Use asterisk for out-of-jurisdiction sites)
d. Level 3	(2)		Alpha-Numeric	Region
e. Level 4	(4)		Alpha-Numeric	Area
f. Level 5	(7)		Alpha-Numeric	Location
g. Level 6	(3)		Alpha-Numeric	Sub-Location

Comments: All alpha-numeric fields are left justified and blank filled.

9. Release Dates

a. Year, Month, 1st Day (Cols. 44-49)	6	YYMMDD	First and last release dates (year/month/day)
b. Year, Month, Last Day (Cols. 50-55)	6	YYMMDD	(e.g. 860829)

10. Release Stage (Col.56)	1	'E' 'F' 'G' 'P' 'S' 'A' 'blank'	= Emergent fry = Fed fry = Fingerling = Pre-smolt = Smolt = Adult = Unknown
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<u>Datum</u>	<u>Columns</u>	<u>Justi- fication</u>	<u>Format</u>	<u>Explanation</u>
11. Rearing Type (Col. 57)	1		'H' 'W' 'M' 'blank'	= Hatchery reared fish (*includes any wild fish reared in the hatchery) = Wild fish = Mixed hatchery & wild (e.g. tagging down stream migrants) = Unknown
12. Type of Release (Col. 58)	1		'E' 'P' 'B' 'O' 'K' 'I'	= Experimental = Production = Both Experimental and Production = Other = PSC Key Indicator Stocks = Other Index Streams
13. Number Tagged (Ad+CWT) (or LV+CWT...Col. River) (Cols. 59-66)	8	R	Numeric	Number tagged corrected for tag loss and mortality; (Enter zero if release unmarked)
14. Number Adipose Only Marks (Cols. 67-71)	5	R	Numeric	Number that shed tags; (Enter zero if release unmarked)
15. Number Unmarked (Cols. 72-80)	9	R	Numeric	Number of fish released without a mark but represented by tagged group; (NOTE: Report total fish released if release not represented by Ad+CWT mark)
16. "Counting" Method (Col. 81)	1		Alpha	Method used to determine number of unmarked fish in the given release group
			'B' 'C' 'P' 'W' 'Blank'	= Book estimates = Actual physical counts = Petersen estimates = Weight derived estimates = Unknown

<u>Datum</u>	<u>Columns Needed</u>	<u>Justi- fication</u>	<u>Format</u>	<u>Explanation</u>
17. Tag Loss Days (Cols. 82-84)	3	R	Numeric	Number of days fish held to measure tag loss; Fish tagged and released the same day are assigned '0' Tag Loss Days
18. Weight of Fish (Cols. 85-90)	6	R	Numeric	Units = grams/fish (2 implied decimals)
19. Length of Fish (optional) (Cols. 91-96)	6	R	Numeric Units	= millimeters (fork length)
20. Tag Coordinator Code (Zero Filled) (Cols. 97-98)	2	R		Reporting Coordinator
		'01'		= ADFG (S.E. Alaska)
		'02'		= NMFS - Alaska
		'03'		= CDFO
		'04'		= WDF
		'05'		= ODFW
		'06'		= NMFS -Seattle
		'07'		= USFWS
		'08'		= CDFG
		'09'		= BCFW
		'10'		= IDFG
		'11'		= WDW
		'12'		= ADFG (S. Central AK)
		'13'		= MIC (Metlakatla, AK)
		'14'		= NIFC
21. Expected Survival (Col. 99)	1			
		'N'		= Normal range expected
		'D'		= Fish destroyed; Zero survival assumed
		'W'		= Warning flag for serious problems; A comment must be provided in Field 25

<u>Datum</u>	<u>Columns</u>	<u>Justi-</u>	
		<u>Needed</u>	<u>fication</u>
			<u>Format</u>
			<u>Explanation</u>
22. Hatchery/Facility (Cols. 100-118)	19	Alpha-Numeric	Hierachial coding scheme to pinpoint actual site
a. Level 0	(1)		State or Province '1' = Alaska '2' = British Columbia '3' = Washington '4' = Idaho '5' = Oregon '6' = California '7' = High Seas
b. Level 1	(1)		Water Type 'M' = Marine 'F' = Freshwater
c. Level 2	(1)	Alpha-Numeric	Sector (Special case: Use asterisk for out-of- jurisdiction sites)
d. Level 3	(2)	Alpha-Numeric	Region
e. Level 4	(4)	Alpha-Numeric	Area
f. Level 5	(7)	Alpha-Numeric	Location
g. Level 6	(3)	Alpha-Numeric	Sub-Location

Comments: All alpha-numeric fields are left justified and blank filled.

23. Stock (Cols. 119-137)	19	Alpha-Numeric	Hierachial coding scheme to pinpoint actual site
a. Level 0	(1)		State or Province '1' = Alaska '2' = British Columbia '3' = Washington '4' = Idaho '5' = Oregon '6' = California '7' = High Seas
b. Level 1	(1)		Water Type 'M' = Marine 'F' = Freshwater

<u>Datum</u>	<u>Columns Needed</u>	<u>Justification</u>	<u>Format</u>	<u>Explanation</u>
c. Level 2	(1)		Alpha-Numeric	Sector (Special case: Use asterisk for out-of-jurisdiction sites)
d. Level 3	(2)		Alpha-Numeric	Region
e. Level 4	(4)		Alpha-Numeric	Area
f. Level 5	(7)		Alpha-Numeric	Location
g. Level 6	(3)		Alpha-Numeric	Sub-Location

Comments: All alpha-numeric fields are left justified and blank filled.

24. Format Version Number	3 (Cols. 138-140)	R	Numeric	Format version used to report release data; One implied decimal; Zero filled
25. Comments	80 (Cols. 141-220)	L	Alpha-Numeric	Permits brief summary of pertinent information regarding release group; First 35 characters will be printed in annual CWT Release Report

TOTAL COLUMNS: 220

II. CWT RECOVERY DATA

Datum	Columns Needed	Justi- fication	Format	Explanation
1. Reporting Agency (Cols. 1-4)	4	L	Alpha	ADFG, CDFG, WDF, etc.
2. Item ID (Cols. 5-12)	8	R	Alpha-Numeric	Unique ID's assigned to each recovery record by the recovery agency; ID must be unique for a recovery year
3. Recovery Date (Cols. 13-18)	6		YYMMDD	e.g.: August 21, 1986 coded 860821
4. Nature of Recovery Date 1 (Col. 19)			'R' 'C'	= Reported date = Calculated date
5. Sampling Period Type (Col. 20)	1		'1' '2' '3' '4' '5' '6' '7' '8'	= Escapement period (across years possible) = Bi-weekly = Semi-monthly = Statistical months = Calendar months = Statistical weeks (beginning Monday) = Weeks (beginning Sunday) = Seasonal (Use for spring, summer, fall, or winter race periods)
Comments: Sampling Period Type and Period Number must match that used in the Catch and Sample file for the given stratum.				
6. Sampling Period Number (Cols. 21-22)	2	R	Numeric	Zero Filled; (Required to map across to "Sampling Period Range" in the Catch and Sample file)
				(Possible Range:)
			n ='01'	= Escapement period (across years possible)
			n ='01-26'	= Bi-weekly period
			n ='01-24'	= Semi-monthly
			n ='01-12'	= Statistical months
			n ='01-12'	= Calendar months
			n ='01-54'	= Statistical weeks (beginning Monday)

Datum	Columns Needed	Justi- fication	Format	Explanation
			n = '01-54' n = '01-04'	= Weeks beginning Sunday = Seasonal periods 01 = Spring 02 = Summer 03 = Fall 04 = Winter
7. Species (Col. 23)	1		'1' '2' '3' '4' '5' '6' '7' '8'	= Chinook = Coho = Steelhead = Sockeye = Chum = Pink = Masu = Cutthroat
8. Sample Maturity Class (Col. 24)	1		'blank' '1' '2' '3' '4'	= Unknown or not recorded = Immature (0-Ocean fish) = Jacks (1-Ocean fish) = Adults = Mixed (adults, immatures and jacks)
9. Sex (Col. 25)	1		'Blank' 'M' 'F'	= Unknown or not recorded = Male = Female
10. Weight (Cols. 26-28)	3	R	Numeric	Weight in Kilograms (1 implied decimal)
11. Weight Code (Col. 29)	1		'1' '2' '3'	= Round = Dressed, head on = Dressed, head off
12. Weight Type (Col. 30)	1		'1' '2'	= Actual Weight = Calculated Weight (Sample size may be unknown)
13. Length (Cols. 31-34)	4	R	Numeric	Length in Millimeters

Datum	Columns Needed	Justi- fication	Format	Explanation	
14. Length Code (Col. 35)	1		'0' '1' '2' '3' '4' '5'	= Fork Length (*preferred measurement) = Mid-eye to Fork = Mid-eye to Caudal Peduncle = Total Length = Head Length: Eye to Opercula = Head Length: Tip of Snout to Opercula	
15. Length Type (Col. 36)	1		'1' '2'	= Actual Length = Calculated Length (Sample size may be unknown)	
16. Tag Code (Cols. 37-48)	12	L	AAD1D2D3D4.. Alpha-Numeric	Two-Character fields used for Agency, Data 1,2,3,4 *Tag Code must be coded same as on Release File	
17. Replicate Number (Cols. 49-50)	2		Numeric	Replicate number if the tag code represents a replicate release group; Must be within 01 to 07 range and zero filled	
18. Tag Type (Cols. 51-52)	2	R	Numeric	Blank Filled '0' '1' '2' '3' '4' '5' '6' '7' '8' '9'	= Standard Binary (1 mm) = Half Tags (H Type) = Half Tags (B Type) = 6 Word Half Length Tags = Xray Binary = Standard Color = Solid Color (##) = Striped Color (\$\$) = Rare Earth = Embedded Replicate
19. Status of Tag (Col. 53)	1		'1' '2' '3' '4' '7' '8'	= Tag Read OK = No Tag = Tag Lost Before Read = Tag Not Readable = Unresolved Discrepancy = Head Not Processed	

Datum	Columns Needed	Justi- fication	Format	Explanation
20. Sampling Site (Optional) (Cols. 54-57)	4		L Alpha-Numeric	Port of Landing, Hatchery, etc.; Standardized code required
21. Expansion Level (Col. 58)	1		Numeric	Level of resolution at which expansion is made
			'2'	= Level 2 ("Sector")
			'3'	= Level 3 ("Region")
			'4'	= Level 4 ("Area")
			'5'	= Level 5 ("Location")
			'6'	= Level 6 ("Sub-Location")
22. Catch Area (Cols. 59-77)	19		Alpha-Numeric	Hierarchial coding scheme to pinpoint actual site
a. Level 0	(1)			State or Province
			'1'	= Alaska
			'2'	= British Columbia
			'3'	= Washington
			'4'	= Idaho
			'5'	= Oregon
			'6'	= California
			'7'	= High Seas
b. Level 1	(1)			Water Type
			'M'	= Marine
			'F'	= Freshwater
c. Level 2	(1)		Alpha-Numeric	Sector (Special case: Use asterisk for out-of- jurisdiction sites)
d. Level 3	(2)		Alpha-Numeric	Region
e. Level 4	(4)		Alpha-Numeric	Area
f. Level 5	(7)		Alpha-Numeric	Location
g. Level 6	(3)		Alpha-Numeric	Sub-Location

Comments: 1) All alpha-numeric fields are left justified and blank filled.
 2) Recovery site code must be identical to the release site code if
 the tag recovery is made at the original release site!

Datum	Columns Needed	Justi- fication	Format	Explanation
23. Fishery Code (Cols. 78-79)	2		Alpha-Numeric	Standardized codes required; (Must match Catch/Sample records)
24. Estimated Number (Cols. 80-84)	5	R	Numeric (2 implied decimals)	Estimated number of fish with given tagcode in the catch represented by this recovery, as estimated by the reporting agency
25. Sample Type (Col. 85)	1		'1'	Insample recoveries from a sampled fishery with known catch: Expansion value is Non-Zero. (*If sample size is zero, expansion is blank)
			'2'	Voluntary recoveries from a sampled fishery with known catch: Awareness estimates are available; Expansion value is Non-Zero. (e.g. Puget Sound Sport)
			'3'	Voluntary recoveries from an unsampled fishery: Awareness approximations may be possible yielding non-zero expansion values; Otherwise expansion value is Non-Zero (e.g. Hoh River freshwater sport fishery)
			'4'	Insample or voluntary recoveries from a sampled fishery with unknown catch: Expansion value is blank. (e.g. Stream survey)
			'5'	Voluntary recoveries from a sampled fishery with known catch and no awareness estimates available: Use of these recoveries leads to double counting; Expansion value is 0 only. (e.g. Commer. voluntaries)

Datum	Columns Needed	Justi- fication	Format	Explanation
			'6'	Mark Incidence - Indirect Sample: Voluntary recoveries from indirectly sampled sport fishery; Expansions are calculated from observed marks in mark incidence sample size (See data elements #24 and #25 in the Catch and Sample data format)

Comments: 1) Four keys are used to distinguish the type of sample.

- a) Sample: Insample or Voluntary
- b) Fishery: Sampled or Unsamped
- c) Catch: Known or Unknown
- d) Awareness: Available or Unavailable

2) Awareness estimates (option 2) are based on current year's data, while awareness approximations (option 3) are based on extrapolation of data from previous years.

26. Record Type (Col. 86)	1		'2'	Indicates recovery record
27. Gear Code (Cols. 87-88)	2	R	Numeric	Agency gear code; Zero filled; Does not need to match Catch/Sample codes
28. Format Version Number (Cols. 89-91)	3	R	Numeric	Format version used to report recovery dates; One implied decimal; Zero filled

TOTAL COLUMNS: 91

III. CATCH AND SAMPLE DATA

Datum	Columns Needed	Justi- fication	Format	Explanation
1. Reporting Agency (Cols. 1-4)	4	L	Alpha	Agency coding must be same as in recovery records
2. Record Type (Col. 5)	1		'1'	= Catch/Sample record
3. Catch Year (Cols. 6-7)	2		YY	Calendar year when catch made. For escapement which crosses year boundaries, it is year when majority of run returns.
4. Status of Record (Preliminary vs. Final) (Col. 8)	1		'P' 'F'	= Preliminary Data = Finalized Data
5. Date of File Creation (Cols. 9-14)	6		YYMMDD	Date when Catch/Sample last updated (Year-Month-Day). This is the date that the submitting agency last revised any of its own Catch/Sample information for the given year. As such, it applies to all records in the file even though only a few records may have been revised.
4. Species (Col. 15)	1		'1' '2' '3' '4' '5' '6' '7' '8'	= Chinook = Coho = Steelhead = Sockeye = Chum = Pink = Masu = Cutthroat
7. Sample Maturity Class (Col. 16)	1		'blank' '1' '2' '3' '4'	= Unknown age class = Immature (0-Ocean fish) = Jack (1-Ocean fish) = Adult = Mixed (adults, immatures, and jacks)

Datum	Columns Needed	Justi- fication	Format	Explanation
8. Sampling Period Type (Col. 17)	1		'1' '2' '3' '4' '5' '6' '7' '8'	= Escapement period (across years possible) = Bi-weekly = Semi-monthly = Statistical months = Calendar months = Statistical weeks (beginning Monday) = Weeks (beginning Sunday) = Seasonal (Use for spring, summer, fall, or winter race periods)
Comments: Sampling Period Type and Period Number must match that used in the Recovery File for the given area and time stratum.				
9. Sampling Period Number (Cols. 18-19)	2	R	Numeric (Possible Range:) n ='01' n ='01-26' n ='01-24' n ='01-12' n ='01-12' n ='01-54' n ='01-54' n ='01-04'	Zero Filled = Escapement period (across years possible) = Bi-weekly period = Semi-monthly = Statistical months = Calendar months = Statistical weeks (beginning Monday) = Weeks beginning Sunday = Seasonal periods 01 = Spring 02 = Summer 03 = Fall 04 = Winter
10. Sampling Period Range (Non-Standard Expansions) (Cols. 20-23)	4	R	Numeric	Beginning and ending sampling period numbers for situations where CATCH DATA ARE POOLED ACROSS TIME PERIODS: Zero filled; (e.g. weeks 7 through 12 coded "0712"); Blank filled if not used; Applies ONLY to expansion factor calculations; (i.e. other reported numbers are pertinent only to the time period reported).

Datum	Columns Needed	Justi- fication	Format	Explanation
11. Fishery Codes (Cols. 24-25)	2		R Alpha-Numeric	Standardized fishery codes; Must be identical to regionalized coding used in recovery records
12. Catch Area (Cols. 26-44)	19		Alpha-Numeric	Hierachial coding scheme to pinpoint actual site
a. Level 0	(1)			State or Province '1' = Alaska '2' = British Columbia '3' = Washington '4' = Idaho '5' = Oregon '6' = California '7' = High Seas
b. Level 1	(1)		'M' 'F'	Water Type = Marine = Freshwater
c. Level 2	(1)		Alpha-Numeric	Sector (Special case: Use asterisk for out-of-jurisdiction sites)
d. Level 3	(2)		Alpha-Numeric	Region
e. Level 4	(4)		Alpha-Numeric	Area
f. Level 5	(7)		Alpha-Numeric	Location
g. Level 6	(3)		Alpha-Numeric	Sub-Location
Comments: All alpha-numeric fields are left justified and blank filled.				
13. Sample Type (Col. 45)	1		'1'	Insample recoveries from a sampled fishery with known catch: Expansion value is non-zero
			'2'	Voluntary recoveries from a sampled fishery with known catch: Awareness estimates are available; Expansion value is non-zero (e.g. Puget Sound Sport)

Datum	Columns Needed	Justi- fication	Format	Explanation
			'4'	Insample or voluntary recoveries from a sampled fishery with unknown catch; Expansion value is blank (e.g. Stream survey)
			'6'	Mark Incidence - Indirect Sample: Voluntary recoveries from indirectly sampled sport fishery; Expansions are calculated from observed marks in mark incidence sample size (see data fields #24 and #25 below)

Comments: 1) Four keys are used to distinguish the type of sample.

- a) Sample: Insample or Voluntary
- b) Fishery: Sampled or Unsampled
- c) Catch: Known or Unknown
- d) Awareness: Available or Unavailable

2) Awareness estimates (option 2) are based on current year's data

14. Number Caught (Cols. 46-53)	8	R	Numeric	Total catch of species for this area-period-fishery-age class stratum; Use blanks if catch is unknown. (e.g. recovery type 4 and sometimes type 3)
15. Number Sampled (Cols. 54-61)	8	R	Numeric	Number of fish examined for adipose fin mark
16. Awareness Factor (Cols. 62-65)	4	R	Numeric (2 implied decimals)	Expansion factor used for voluntary recoveries in sport fisheries
17. Number of Tags Recovered and Decoded (Cols. 66-70)		R	Numeric	Number of observed tags recovered and decoded in the sampling stratum; (i.e. Tag Status = 1)
18. Estimated Number (Cols. 71-75)	5	R	Numeric (2 implied decimals)	Estimated number of fish in the catch represented by the individual recovery

Datum	Columns Needed	Justi- fication	Format	Explanation
19. Numbers of "No Tags" (Cols. 76-79)	4		R	Numeric
20. Number of "Lost Tags" (Cols. 80-82)	3		R	Numeric
21. Number Unreadable Tags (Cols. 83-85)	3		R	Numeric
22. Number of Unresolved Tag Code Discrepancies (Cols. 86-88)	3		R	Numeric
23. Number of Lost Heads or Heads Not Processed (Cols. 89-93)	5		R	Numeric
24. Mark Incidence Sample Size (Cols. 94-98)	5		R	Numeric
25. Observed Marks in Mark Incidence Sample (Cols. 99-102)	4		R	Numeric
26. Format Version Number (Cols. 103-105)	3		R	Numeric

Datum	Columns Needed	Justi- fication	Format	Explanation
27. Expansion Level (Col. 106)	1		Numeric	Level of resolution at which expansion made
			'2'	= Level 2 ("Sector")
			'3'	= Level 3 ("Region")
			'4'	= Level 4 ("Area")
			'5'	= Level 5 ("Location")
			'6'	= Level 6 ("Sub-Location")

TOTAL COLUMNS: 106

IV. LOCATION CODE FILE

Datum	Columns Needed	Justi- fication	Format	Explanation
1. Location Code (Cols 1-19)	19		Alpha-Numeric	19 character code used to identify hatchery release site, recovery site, or stock; Coding based on hierachial scheme to give multiple levels of resolution
		(Col. 20 - Blank)		
2. Record ID (Col. 21)	1			Type of location code
			'1'	= Recovery Site
			'2'	= Catch Sample (Code should match Recovery Site Code at Expansion Level)
			'3'	= Release Facility
			'4'	= Release Site
			'5'	= Stock
		(Col. 22 - Blank)		
3. Description (Cols. 23-123)	101	L	Alpha-Numeric	Name of location plus appropriate description as needed.
				*If Byte 3 in the location code is an asterisk, (i.e. out-of-jurisdiction sites), then the description must begin with a 2-character abbreviation (e.g. AK, BC, WA, etc.) indicating actual origin. The State or Province must be different than that coded in level 0.
4. File Creation Date (Cols. 124-129)	6		YYMMDD	Date when Location Code file last updated
5. Format Version Number (Cols. 130-132)	3	R	Numeric	Format version used to report recovery data; One implied decimal; Zero filled.

TOTAL COLUMNS: 132

APPENDIX 4.2

VALIDATION OF PSC DATA ELEMENTS - RELEASE TAPES
DEFINED 5/12/88 AT SEATTLE, WA

PAGE 1
VERSION 1.2

<u>FIELD</u>	<u>VALIDATION</u>															
1.A TAG CODE	<p>MUST have even number of characters. MUST be unique. MUST not exceed 12 characters. MUST match one of these patterns:</p> <ul style="list-style-type: none"> all numeric all alpha 1 alpha then all numeric all numeric then '*' then 1 numeric 1 alpha then all numeric then '*' then 1 numeric all alpha then '*' then 1 numeric '##' then 2 alpha '##' then 2 alpha then '*' then 1 numeric '\$\$' then 2 alpha '\$\$' then 2 alpha then '*' then 1 numeric special cases 'XX0500' 'HF1505' 'HF1515' 															
1.B UNIQUE ID	<p>MUST be unique. First character MUST be '!'. Second and third characters MUST match one of these Tag Coordinator codes:</p> <table style="margin-left: 20px;"> <tr><td>'01'</td><td>'02'</td><td>'03'</td><td>'04'</td><td>'05'</td></tr> <tr><td>'06'</td><td>'07'</td><td>'08'</td><td>'09'</td><td>'10'</td></tr> <tr><td>'11'</td><td>'12'</td><td>'13'</td><td>'14'</td><td></td></tr> </table> <p>Fourth through twelfth characters may not have embedded blanks (may have trailing blanks).</p>	'01'	'02'	'03'	'04'	'05'	'06'	'07'	'08'	'09'	'10'	'11'	'12'	'13'	'14'	
'01'	'02'	'03'	'04'	'05'												
'06'	'07'	'08'	'09'	'10'												
'11'	'12'	'13'	'14'													
2. # OF REPLICATES	MUST be exactly two digits in range '01' through '07'.															
3. TAG TYPE	<p>MUST be two characters. First character MUST be blank. Second character MUST match one of these:</p> <ul style="list-style-type: none"> '0' for Standard Binary (1mm) '1' for Half Length (H series) '2' for Half Length (B series) '3' for Six-word Wire '4' for Xray Binary '5' for Standard Color '6' for Solid Color (## series) '7' for Striped Color (## series) '8' for Rare Earth 															

<u>FIELD</u>	<u>VALIDATION</u>
	'9' for Embedded Replicate If '4', TAG CODE (1A) MUST be 'XX0500'
4. SPECIES	MUST match one of these: '1' for Chinook '2' for Coho '3' for Steelhead '4' for Sockeye '5' for Chum '6' for Pink '7' for Masu '8' for Cutthroat
5. RUN	MUST match one of these: '1' for Spring '2' for Summer '3' for Fall (or Type S coho) '4' for Winter '5' for Hybrid '6' for Landlocked '7' for Late Fall (or Type N coho)
6. BROOD YEAR	MUST be exactly 2 digits. MUST be between 69 and current year.
7. RELEASE AGENCY	MUST conform to rules in Addendum A.
8. RELEASE SITE	MUST not exceed 19 characters. First character MUST match one of these: '1' for Alaska '2' for British Columbia '3' for Washington '4' for Idaho '5' for Oregon '6' for California '7' for High Seas Field MUST exactly match an entry in Location File supplied by region named in first character.
9. RELEASE DATES	MUST be in format of a legal date. Last date MUST be >= First date.
10. RELEASE STAGE	MUST match one of these: 'A' for adult 'E' for emergent fry 'F' for fed fry 'G' for fingerling

<u>FIELD</u>	<u>VALIDATION</u>
	'P' for pre-smolt 'S' for smolt
11. REARING TYPE	MUST match one of these: 'H' for hatchery 'M' for mixed 'W' for wild If 'W' then HATCHERY(21) MUST be blank.
12. TYPE OF RELEASE	MUST match one of these: 'E' for experimental 'P' for production 'B' for both experimental and production 'I' for index 'K' for PSC key stream 'O' for Other
13. # TAGGED	MUST be numeric, blank or zero filled, right justified in a field of 8.
14. # AD ONLY MARKS	MUST be numeric, blank or zero filled, right justified in a field of 5.
15. # UNMARKED	MUST be numeric, blank or zero filled, right justified in a field of 9.
16. COUNTING METHOD	MUST match one of these: 'B' for book estimates 'C' for actual physical counts 'P' for Petersen estimates 'W' for weight derived estimates
17. TAG LOSS DAYS	MUST be numeric, blank or zero filled, right justified in a field of 3.
18. WEIGHT	MUST be numeric, blank or zero filled, right justified in a field of 6.
19. LENGTH	MUST be numeric, blank or zero filled, right justified in a field of 6.

<u>FIELD</u>	<u>VALIDATION</u>
20. TAG COORDINATOR	MUST match one of these: '01' for ADFG Southeast '02' for NMFS Alaska '03' for CDFO '04' for WDF '05' for ODFW '06' for NMFS Seattle '07' for USFWS '08' for CDFG '09' for BCFW '10' for IDFG '11' for WDW '12' for ADFG Southcentral '13' for MIC '14' for NWIFC
21. EXP. SURVIVAL	MUST match one of these: 'D' for destroyed 'N' for normal 'W' for warning If 'W' then COMMENTS (25) must not be blank.
22. HATCHERY	MUST be blank if REARING TYPE (11) is 'W'. MUST not exceed 19 characters. First character MUST match one of these: '1' for Alaska '2' for British Columbia '3' for Washington '4' for Idaho '5' for Oregon '6' for California '7' for High Seas Field MUST exactly match an entry in Location File supplied by region named in first character.
23. STOCK	MUST not exceed 19 characters. First character MUST match one of these: '1' for Alaska '2' for British Columbia '3' for Washington '4' for Idaho '5' for Oregon '6' for California '7' for High Seas Field MUST exactly match an entry in Location File supplied by region named in first character.

<u>FIELD</u>	<u>VALIDATION</u>
24. FORMAT VERSION	MUST be numeric, zero filled, right justified in a field of 3. The one value MUST be on every record in the submission. MUST not be blank.
25. COMMENTS	MUST not exceed 80 characters.

MEDIUM REQUIREMENTS:

9-track magnetic tape
1600-BPI
ASCII
unlabeled
blocked 8140 (37 records of 220 bytes per block)

NOTES: Unless explicitly stated otherwise, any field may be composed entirely of blanks signifying 'Unknown' or 'Not Applicable'.

Any field which cannot be filled because the format or code structure is incapable of conveying an appropriate value is to be filled with a string of commercial 'at' signs (@).

For this document a "numeric" field is composed only of digits (no signs, decimal points, embedded blanks).

VALIDATION OF PSC DATA ELEMENTS - RECOVERY TAPES
DEFINED 5/12/88 AT SEATTLE, WA

PAGE 1
VERSION 1.2

<u>FIELD</u>	<u>VALIDATION</u>
1. AGENCY	MUST conform to rules in Addendum B. The one code MUST be on every record in the submission.
2. ITEM ID	MUST be unique within the tape file. MUST not be blank.
3. DATE OF RECOVERY	Characters 1 and 2 MUST be numeric in the range '70' through the last 2 digits of the current year. Characters 3 and 4 MUST be numeric, zero filled, in the range '01' through '12'. MUST be blank if characters 1 and 2 are blank. May be blank if PERIOD TYPE (5) is '1' or '8'. Characters 5 and 6 MUST be numeric, zero filled, in the range '01' through the last day of the month referenced by characters 3 and 4. MUST be blank if characters 3 and 4 are blank. May be blank even if characters 1 through 4 are not blank. The YYMMDD date defined in this field MUST be less than or equal to today.
4. NATURE OF DATE	MUST match one of these: 'R' for reported date 'C' for calculated date
5. PERIOD TYPE	MUST match one of these: '1' for escapement period '2' for biweekly '3' for semi-monthly '4' for statistical months '5' for calendar months '6' for stat weeks beginning Monday '7' for weeks beginning Sunday '8' for seasonal

<u>FIELD</u>	<u>VALIDATION</u>																		
6. PERIOD NUMBER	MUST be numeric, zero filled, right justified in a field of 2. For the PERIOD TYPE (5) shown, this field MUST be within the listed range: <table><thead><tr><th>TYPE</th><th>RANGE</th></tr></thead><tbody><tr><td>1</td><td>01 only</td></tr><tr><td>2</td><td>01-26</td></tr><tr><td>3</td><td>01-24</td></tr><tr><td>4</td><td>01-12</td></tr><tr><td>5</td><td>01-12</td></tr><tr><td>6</td><td>01-54</td></tr><tr><td>7</td><td>01-54</td></tr><tr><td>8</td><td>01-04</td></tr></tbody></table>	TYPE	RANGE	1	01 only	2	01-26	3	01-24	4	01-12	5	01-12	6	01-54	7	01-54	8	01-04
TYPE	RANGE																		
1	01 only																		
2	01-26																		
3	01-24																		
4	01-12																		
5	01-12																		
6	01-54																		
7	01-54																		
8	01-04																		
7. SPECIES	MUST match one of these: '1' for Chinook '2' for Coho '3' for Steelhead '4' for Sockeye '5' for Chum '6' for Pink '7' for Masu '8' for Cutthroat																		
8. SAMPLE Maturity	MUST match one of these: '1' for immature '2' for jacks '3' for adults '4' for mixed																		
9. SEX	MUST match one of these: 'M' for male 'F' for female																		
10. WEIGHT	MUST be numeric, blank or zero filled, right justified in a field of 3. MUST not be zero.																		
11. WEIGHT CODE	MUST match one of these: '1' for round '2' for dressed, head on '3' for dressed, head off																		
12. WEIGHT TYPE	MUST match one of these: '1' for actual weight '2' for calculated weight																		

NOTE: Fields 10, 11 and 12 MUST all have values, or MUST all be blank.

<u>FIELD</u>	<u>VALIDATION</u>
13. LENGTH	MUST be numeric, blank or zero filled, right justified in a field of 4.
14. LENGTH CODE	MUST match one of these: '0' for fork length '1' for mid-eye to fork '2' for mid-eye to caudal peduncle '3' for total length '4' for head: eye to operculum '5' for head: tip of snout to operculum
15. LENGTH TYPE	MUST match one of these: '1' for actual length '2' for calculated length
NOTE: Fields 13, 14 and 15 MUST all have values, or MUST all be blank.	
16. TAG CODE	MUST have even number of characters. MUST not exceed 12 characters. MUST match one of these patterns: all numeric all alpha 1 alpha then all numeric all numeric then '*' then 1 numeric 1 alpha then all numeric then '*' then 1 numeric all alpha then '*' then 1 numeric '##' then 2 alpha '##' then 2 alpha then '*' then 1 numeric '\$\$' then 2 alpha '\$\$' then 2 alpha then '*' then 1 numeric special cases 'XX0500' 'HF1505' 'HF1515' If TAG STATUS (19) is '1', then TAG CODE (16) MUST not be blank.
17. REPLICATE #	MUST be exactly two digits in range '01' through '07'.

<u>FIELD</u>	<u>VALIDATION</u>
18. TAG TYPE	<p>MUST be two characters. First character MUST be blank. Second character MUST match one of these: '0' for Standard Binary (lmm) '1' for Half Length (H series) '2' for Half Length (B series) '3' for Six-word Wire '4' for Xray Binary '5' for Standard Color '6' for Solid Color (## series) '7' for Striped Color (\$\$ series) '8' for Rare Earth '9' for Embedded Replicate If '4' the TAG CODE (16) MUST be 'XX0500'.</p>
19. TAG STATUS	<p>MUST match one of these: '1' for Tag Read OK '2' for No Tag '3' for Tag Lost Before Read '4' for Tag Not Readable '7' for Unresolved Discrepancy '8' for Head Not Processed If '1', the TAG CODE (16) MUST not be blank.</p>
20. SAMPLING SITE	<p>MUST be 1 to 4 characters, blank filled, left justified in a field of 4. MUST match an entry in table supplied by Reporting Agency (field #1).</p>
21. EXPANSION LEVEL	MUST be a single digit between 2 and 6.
22. CATCH AREA	<p>MUST not exceed 19 characters. First character MUST match one of these: '1' for Alaska '2' for British Columbia '3' for Washington '4' for Idaho '5' for Oregon '6' for California '7' for High Seas Field MUST exactly match an entry in Location File supplied by region named in first character.</p>

<u>FIELD</u>	<u>VALIDATION</u>
23. FISHERY CODE	MUST match one of these: '10' '11' '12' '13' '14' '15' '16' '19' '20' '21' '22' '23' '24' '25' '26' '27' '28' '29' '40' '41' '42' '43' '44' '45' '46' '47' '49' '50' '51' '52' '53' '54' '55' '56' '59' '60' '61' '62' '63' '64' '69' '70' '71' '72' '73' '74' '79' '80' '81' '82' '83' '84' '85' '89' '90' '91' '92' '93' '94' '99'
24. ESTIMATED #	MUST be numeric, blank or zero filled, right justified in a field of 5.
25. SAMPLE TYPE	MUST match one of these: '1' '2' '3' '4' '5' '6' MUST not be blank.
26. RECORD TYPE	MUST be '2'.
27. GEAR CODE	MUST be numeric, zero filled, right justified in a field of 2.
28. FORMAT VERSION	MUST be numeric, zero filled, right justified in a field of 3. The one value MUST be on every record in the submission. MUST not be blank.

<u>FIELD</u>	<u>VALIDATION</u>
MEDIUM REQUIREMENTS:	
9-track magnetic tape	
1600-BPI	
ASCII	
unlabeled	
blocked 8190 (90 records of 91 bytes per block)	

NOTES: Unless explicitly stated otherwise, any field may be composed entirely of blanks signifying 'Unknown' or 'Not Applicable'.

Any field which cannot be filled because the format or code structure is incapable of conveying an appropriate value is to be filled with a string of commercial 'at' signs (@).

For this document a "numeric" field is composed only of digits (no signs, decimal points, embedded blanks).

VALIDATION OF PSC DATA ELEMENTS - CATCH/SAMPLE TAPES PAGE 1
DEFINED 5/12/88 AT SEATTLE, WA VERSION 1.2

<u>FIELD</u>	<u>VALIDATION</u>
1. AGENCY	MUST conform to rules in Addendum C. The one code MUST be on every record in the submission.
2. RECORD TYPE	MUST be '1'.
3. CATCH YEAR	MUST be numeric in the range '70' through the last 2 digits of the current year.
4. STATUS OF RECORD	MUST match one of these: 'P' for preliminary 'F' for final
5. DATE OF FILE	Characters 1 and 2 MUST be numeric in the range '70' through the last 2 digits of the current year. Characters 3 and 4 MUST be numeric, zero filled, in the range '01' through '12'. Characters 5 and 6 MUST be numeric, zero filled, in the range '01' through the last day of the month referenced by characters 3 and 4. The YYMMDD date defined in this field MUST be less than or equal to today.
6. SPECIES	MUST match one of these: '1' for Chinook '2' for Coho '3' for Steelhead '4' for Sockeye '5' for Chum '6' for Pink '7' for Masu '8' for Cutthroat
7. SAMPLE MATURITY	MUST match one of these: '1' for immature '2' for jacks '3' for adults '4' for mixed

<u>FIELD</u>	<u>VALIDATION</u>																		
8. PERIOD TYPE	MUST match one of these: '1' for escapement period '2' for biweekly '3' for semi-monthly '4' for statistical months '5' for calendar months '6' for stat weeks beginning Monday '7' for weeks beginning Sunday '8' for seasonal																		
9. PERIOD NUMBER	MUST be numeric, zero filled, right justified in a field of 2. For the PERIOD TYPE (8) shown, this field MUST be within the listed range: <table><thead><tr><th>TYPE</th><th>RANGE</th></tr></thead><tbody><tr><td>1</td><td>01 only</td></tr><tr><td>2</td><td>01-26</td></tr><tr><td>3</td><td>01-24</td></tr><tr><td>4</td><td>01-12</td></tr><tr><td>5</td><td>01-12</td></tr><tr><td>6</td><td>01-54</td></tr><tr><td>7</td><td>01-54</td></tr><tr><td>8</td><td>01-04</td></tr></tbody></table>	TYPE	RANGE	1	01 only	2	01-26	3	01-24	4	01-12	5	01-12	6	01-54	7	01-54	8	01-04
TYPE	RANGE																		
1	01 only																		
2	01-26																		
3	01-24																		
4	01-12																		
5	01-12																		
6	01-54																		
7	01-54																		
8	01-04																		
10. PERIOD RANGE	MUST be numeric, zero filled. Characters 1 and 2 MUST represent a valid PERIOD NUMBER (9). Characters 3 and 4 MUST represent a valid PERIOD NUMBER (9). The value in bytes 1-2 MUST be less than the value in bytes 3-4.																		
11. FISHERY CODE	MUST match one of these: '10' '11' '12' '13' '14' '15' '16' '19' '20' '21' '22' '23' '24' '25' '26' '27' '28' '29' '40' '41' '42' '43' '44' '45' '46' '47' '49' '50' '51' '52' '53' '54' '55' '56' '59' '60' '61' '62' '63' '64' '69' '70' '71' '72' '73' '74' '79' '80' '81' '82' '83' '84' '85' '89' '90' '91' '92' '93' '94' '99'																		

<u>FIELD</u>	<u>VALIDATION</u>
12. CATCH AREA	MUST not exceed 19 characters. First character MUST match one of these: '1' for Alaska '2' for British Columbia '3' for Washington '4' for Idaho '5' for Oregon '6' for California '7' for High Seas Field MUST exactly match an entry in Location File supplied by region named in first character.
13. SAMPLE TYPE	MUST match one of these: '1' '2' '4' '6' MUST not be blank.
14. NUMBER CAUGHT	MUST be numeric, blank or zero filled, right justified in a field of 8.
15. NUMBER SAMPLED	MUST be numeric, blank or zero filled, right justified in a field of 8.
16. AWARENESS	MUST be numeric, blank or zero filled, right justified in a field of 4.
17. TAGS STATUS 1	MUST be numeric, blank or zero filled, right justified in a field of 5.
18. ESTIMATED #	MUST be numeric, blank or zero filled, right justified in a field of 5.
19. TAGS STATUS 2	MUST be numeric, blank or zero filled, right justified in a field of 4.
20. TAGS STATUS 3	MUST be numeric, blank or zero filled, right justified in a field of 3.
21. TAGS STATUS 4	MUST be numeric, blank or zero filled, right justified in a field of 3.
22. TAGS STATUS 7	MUST be numeric, blank or zero filled, right justified in a field of 3.
23. TAGS STATUS 8	MUST be numeric, blank or zero filled, right justified in a field of 5.

<u>FIELD</u>	<u>VALIDATION</u>
24. M/I SAMPLE SIZE	MUST be numeric, blank or zero filled, right justified in a field of 5.
25. M/I OBSERVED	MUST be numeric, blank or zero filled, right justified in a field of 4.
26. FORMAT VERSION	MUST be numeric, zero filled, right justified in a field of 3. The one value MUST be on every record in the submission. MUST not be blank.
27. EXPANSION LEVEL	MUST be a single digit between '2' and '6'.

MEDIUM REQUIREMENTS:

9-track magnetic tape
1600-BPI
ASCII
unlabeled
blocked 8162 (77 records of 106 bytes per block)

NOTES: Unless explicitly stated otherwise, any field may be composed entirely of blanks signifying 'Unknown' or 'Not Applicable'.

Any field which cannot be filled because the format or code structure is incapable of conveying an appropriate value is to be filled with a string of commercial '@' signs (@).

For this document a "numeric" field is composed only of digits (no signs, decimal points, embedded blanks).

VALIDATION OF PSC DATA ELEMENTS - LOCATION TAPES
DEFINED 5/12/88 AT SEATTLE, WAPAGE 1
VERSION 1.2

<u>FIELD</u>	<u>VALIDATION</u>
1. CODE STRIP	MUST not exceed 19 characters. First character must match one of these: '1' for Alaska '2' for British Columbia '3' for Washington '4' for Idaho '5' for Oregon '6' for California '7' for High Seas
2. RECORD ID	MUST match one of these: '1' for Recovery Area '2' for Catch/Sample Area '3' for Hatchery/Facility '4' for Release Site '5' for Stock MUST not be blank.
3. DESCRIPTION	MUST be blank filled, left justified in a field of 101.
4. DATE OF FILE	Characters 1 and 2 MUST be numeric in the range '70' through the last 2 digits of the current year. Characters 3 and 4 MUST be numeric, zero filled, in the range '01' through '12'. Characters 5 and 6 MUST be numeric, zero filled, in the range '01' through the last day of the month referenced by characters 3 and 4. The YYMMDD date defined in this field MUST be less than or equal to today.
5. FORMAT VERSION	MUST be numeric, zero filled, right justified in a field of 3. The one value MUST be on every record on the tape. MUST not be blank.

MEDIUM REQUIREMENTS:

9-track magnetic tape
1600-BPI
ASCII
unlabeled

<u>FIELD</u>	<u>VALIDATION</u>
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blocked 8184 (62 records of 132 bytes per block)

NOTES: Unless explicitly stated otherwise, any field may be composed entirely of blanks signifying 'Unknown' or 'Not Applicable'.

Any field which cannot be filled because the format or code structure is incapable of conveying an appropriate value is to be filled with a string of commercial 'at'signs (@).

For this document a "numeric" field is composed only of digits (no signs, decimal points, embedded blanks).

VALIDATION OF PSC DATA ELEMENTS - PERMANENT ADDENDA PAGE 1
VERSION 1.2

The following documents constitute the Permanent Addenda to the PSC Coastwide Mark/Recovery Data Set Validation Rules. The fields addressed in this section have been identified as being especially dynamic: new values are needed on a regular basis.

In general, updating the definitions of fields requires a formal format revision. The process of format revision, which requires multilateral concurrence, is time consuming and expensive.

The requirement for format revision is waived for fields specified in this section for purposes of adding new values. The addenda may be updated after informal review and consent from the overseeing body. However, changes of substance such as new field sizes, formats, or meanings are still subject to the formal format revision process.

ADDENDUM A

FIELD Release Agency
FILE CWT Releases
ADOPTED 5/12/88 in Seattle, WA
AUTHORIZED Working Group on Mark/Recovery Databases

RELEASE AGENCY MUST match one of these:

'AAI '	'ADFG'	'AKAF'	'AKI '	'ANAD'
'BCFW'	'BHSR'	'CDFG'	'CDFO'	'CDFR'
'CEDC'	'CERA'	'CIAA'	'COOP'	'DIPC'
'DOMS'	'ELWA'	'FDC '	'FWS '	'H&H '
'HECK'	'HOH '	'HSU '	'HVT '	'IDFG'
'KETA'	'LUMM'	'MAKA'	'MIC '	'MUCK'
'NISQ'	'NLNS'	'NMFS'	'NSRA'	'OAF '
'ODFW'	'OPSR'	'OSU '	'PNPT'	'PPWR'
'PUYA'	'PWSA'	'QDNR'	'QUIL'	'SIVF'
'SJ '	'SKAG'	'SKOK'	'SOF '	'SQAX'
'SSC '	'SSRA'	'STIL'	'SUQ '	'TULA'
'UAJ '	'UW '	'WDF '	'WDW '	'YAKI'

ADDENDUM B

FIELD Agency
FILE CWT Recoveries
ADOPTED 5/12/88 in Seattle, WA
AUTHORIZED Working Group on Mark/Recovery Databases

AGENCY MUST match one of these:
'ADFG' 'CDFG' 'CDFO' 'FWS'
'IDFG' 'NIFC' 'NMFS' 'ODFW'
'QDNR' 'WDF' 'WDW'

ADDENDUM C

FIELD Agency
FILE CWT Catch/Samples
ADOPTED 5/12/88 in Seattle, WA
AUTHORIZED Working Group on Mark/Recovery Databases

AGENCY MUST match one of these:
'ADFG' 'CDFG' 'CDFO' 'FWS'
'IDFG' 'NIFC' 'NMFS' 'ODFW'
'QDNR' 'WDF' 'WDW'

APPENDIX 4.3: DETAILED DEFINITION OF LOCAL TERMS USED IN PSC CWT DATA EXCHANGE

ADF&G CWT Terms Defined

FIELD	Status of Tag
FILE	CWT Recoveries
SOURCE	ADF&G

TERM	DEFINITION
-----	-----
Status 1:	Tag was successfully decoded with a valid value. Used also for a valid embedded replicate tag code even if replication digits are unreadable.
Status 2:	No tag was found in head.
Status 3:	Tag was extracted from head but was lost before being decoded.
Status 4:	Tag was extracted from head but could not be read because it was mutilated.
Status 7:	An Unresolved Discrepancy is coded in the following circumstances: <ul style="list-style-type: none">- reused tag code- species positively identified by sampler does not match species tagged- tag identifies fish as impossibly old- a code purchased by an Alaskan agency was encountered, but the Tag Coordinator has no record of its being released.- fish was recovered at an extremely unlikely location (eg. Oregon Coho at northern Alaska hatchery rack).
Status 8:	An clipped fish was identified, but head was never received at the tag lab.

ADF&G CWT Terms Defined

FIELD	Estimated Number
FILE	CWT Recoveries and Catch/Samples
SOURCE	ADF&G

Estimated Number for an individual recovery is calculated by:

$$(N / N2) * (M1 / M2) * (A1 / A2)$$

where:

- N is total catch (or escapement) in the stratum.
- N2 is number of individuals sampled for ad clips in the stratum.
- M1 is number of tags detected in specimens at the Tag Lab in the stratum.
- M2 is number of tags successfully decoded at the Tag Lab in the stratum.
- A1 is number of ad clips identified by samplers in the stratum.
- A2 is number of heads received at the Tag Lab in the stratum.

ADF&G frequently uses these terms:

- N/N2 = sampling fraction expansion factor
- M1/M2 = lost/unreadable tag expansion factor
- A1/A2 = lost head expansion factor

Commonly used stratifications are:

- Comm'l troll: Quadrant/combined weeks/species
- Comm'l non-troll: District/week/species
- Cost Recovery: District/week/species
- Test Fisheries: District/week/species

ADF&G CWT Terms Defined

FIELD	Awareness Factor
FILE	CWT Recoveries
SOURCE	ADF&G

Awareness Factor is not currently employed by ADF&G.

ADF&G CWT Terms Defined

FIELD Counting Method
FILE CWT Releases
SOURCE ADF&G

TERM	DEFINITION
-----	-----
Actual Count	Counts where individual fish are tallied either electronically or by hand count.
Book Value	Counts derived by deducting mortalities from previous lifestage estimates. The particular lifestage basis may vary by species and/or facility.
Petersen	Point estimates statistically calculated using a mark and recapture methodology.
By Weight	The number of individuals in a subsample of known mass or volume are extrapolated by the total mass or volume of the release lot.

ADF&G CWT Terms Defined

FIELD Run
FILE CWT Releases
SOURCE ADF&G

TERM	DEFINITION
-----	-----
SPRING:	Chinook which enter rivers in May-June. All Alaskan chinook are classed as Spring chinook.
SUMMER:	Steelhead, chum, and coho which enter rivers in July-August.
FALL:	Chum and Coho which enter rivers in September-October. Most Alaskan coho are classed as fall coho.
WINTER:	Coho stocks which spawn in December-January. Steelhead which enter rivers in December-February and spawn in April-May.
HYBRID:	An individual or group resulting from parents of different stocks (interracial), species (interspecific), or genus (intergeneric).
LANDLOCKED:	Fish unable to reach the ocean because of lack of adequate passage.

ADF&G CWT Terms Defined

FIELD Release Stage
FILE CWT Releases
SOURCE ADF&G

TERM DEFINITION

EMERGENT FRY: The stage from time of emergence to a gain of less than 25% emergent weight.

FED FRY: The stage bracketed by gains of 25% to 99% of emergent weight.

FINGERLING: The stage bracketed by gains of 100% to 2000% of emergent weight.

PRESMOLT: Released in freshwater and expected to enter the marine environment during that calendar year.

SMOLT: Able to osmoregulate to a marine environment.

ADULT: 1+ocean or older fish.

ADF&G CWT Terms Defined

FIELD	Type of Release
FILE	CWT Releases
SOURCE	ADF&G
TERM	DEFINITION
-----	-----
EXPERIMENTAL:	Fish released from hatcheries primarily for providing information, and secondarily for harvest by user groups. Any group of fish that have been purposely treated differently than is usual for that facility such that the effect of the new treatment (variable) can be compared to lots not receiving that treatment, or to lots receiving a different treatment. Although control lots are striven for, sometimes two or more lots receiving new treatments are compared among themselves.
PRODUCTION:	Fish released from hatcheries for eventual harvest by user groups. Such fish are propagated using what was considered "normal" methods for that hatchery and that species during that year. No variables will be compared among fish in that lot. Coded Wire Tag production lots do not necessarily represent total production of a facility, as some production may not be represented by CWTs.
BOTH:	Fish released from hatcheries primarily for eventual harvest by user groups, and secondarily for providing information. A rule of thumb for distinguishing this class from Experimental is if experimental protocols are violated, EXPERIMENTAL lots will be destroyed while BOTH lots will be released anyway.
INDEX:	Not used in Alaska.
PSC KEY:	Reserved for possible use by PSC Technical Committees should key indicator stocks be defined.

ADF&G CWT Terms Defined

FIELD Nature of Recovery Date
FILE CWT Recoveries
SOURCE ADF&G

TERM DEFINITION

CALCULATED: Not used in Alaska.

REPORTED: For Commercial and Test Fishery samples, date
fish were sold. For Sport, Cost Recovery, Rack
and Weir samples, date fish were sampled.

ADF&G CWT Terms Defined

FIELD	Status of Record
FILE	CWT Catch/Samples
SOURCE	ADF&G

TERM	DEFINITION
-----	-----
PRELIMINARY:	Data values before all pertinent information is known and before all error checking has been done. Analyses on such data, if any, must explicitly consider and state the scope of known limitations on the data. For Commercial, Test Fishery, and Cost Recovery fisheries, statistics are based on inseason catch estimates and/or actual fish tickets.
FINAL:	Data values after all pertinent information that will be collected has been collected and entered, and all standard error checking has been done. For Commercial, Test Fishery, and Cost Recovery fisheries, statistics are always based on actual fish tickets. There is no policy in effect prohibiting corrections to 'final' data.

ADF&G CWT Terms Defined

FIELD	Stock
FILE	CWT Releases
SOURCE	ADF&G

A stock is a group of fish originating from a single river. If a stock is transplanted to another system or facility for release, it retains the original stock name until eggs are taken from progeny of the original release returning to the new system. At that point, the stock designation of the eggs is that of the new system.

Exceptions exist:

The form "Name1 + Name2" indicates fertile eggs of stock Name1 and fertile eggs of stock Name2 were intermixed before tagging.

The form "Name1 x Name2" indicates eggs of one stock were fertilized with milt of a different stock.

The form "Name1 (Name2)" indicates that, while Name1 is the normally defined stock, Name2 was the original stock of ancestry.

The form "Name Mix" indicates facility Name released the fish, but inadequate records of original stock were kept.

CDFO CWT Terms Defined

FIELD Status of Tag
FILE CWT Recoveries
SOURCE CDFO

TERM	DEFINITION
----	-----
Status 1:	Tag was successfully decoded with a valid value.
Status 2:	No tag was found in head.
Status 3:	Tag was extracted from head but was lost before being decoded.
Status 4:	Tag was extracted from head but could not be read.
Status 7:	An unresolved discrepancy is coded for anything that is not status 1, 2, 3, 4, or 8. Used also for a valid embedded replicate tag code whose replication digits are unreadable.
Status 8:	An clipped fish was identified, but head was never dissected.

CDFO CWT Terms Defined

FIELD	Estimated Number
FILE	CWT Recoveries and Catch/Samples
SOURCE	CDFO

Estimated Number for an individual recovery is calculated by:

$$EST = (C/S) * (1 + (LP/KN) + (ND * (KN + LP) / (KN + LP + NP)) * KN)$$

where:

C is total catch (or escapement) in the stratum.

S is number of individuals sampled for ad clips in the stratum.

KN is number of recoveries with status 1 in the stratum.

LP is number of recoveries with status 3 and 4 in the stratum.

NP is number of recoveries with status 2 in the stratum.

ND is number of recoveries with status 7 and 8 in the stratum.

CDFO frequently uses these terms:

C/S = sampling fraction expansion factor

LP/KN = lost/unreadable tag expansion factor

Commonly used stratifications are:

Comm'l troll: catch region/stat week/species

Comm'l net: catch region/stat week/species

Sport recovery: catch region/month/species

CDFO CWT Terms Defined

FIELD	Awareness Factor
FILE	CWT Recoveries
SOURCE	CDFO

Awareness Factor is (the number of heads turned in by sportfishermen) / (the number of heads estimated in the catch for that stratum).

CDFO CWT Terms Defined

FIELD Counting Method
FILE CWT Releases
SOURCE CDFO

TERM	DEFINITION
-----	-----
Actual Count	all fish released are enumerated.
Book Value	the number of eggs incubated - all mortalities counted until release.
Petersen	the recapture of adipose clips in a pond to estimate the total number of fish released.
By Weight	

CDFO CWT Terms Defined

FIELD Run
FILE CWT Releases
SOURCE CDFO

TERM DEFINITION

Run is defined as the season in which the majority of broodstock adults leave a marine environment and enter fresh water on the spawning migration.

SPRING: March through April

SUMMER: June through August

FALL: September through November

WINTER: December through February

HYBRID:

LANDLOCKED:

CDFO CWT Terms Defined

FIELD	Release Stage
FILE	CWT Releases
SOURCE	CDFO
TERM	DEFINITION
-----	-----
EMERGENT FRY:	Code UF; unfed fry Code UFC; unfed fry channels
FED FRY:	Code FFS; fed fry seapen Code FF; fed fry
FINGERLING:	Code FFL; fed fry lake
PRESMOLT:	Code YE; yearlings (coho, sockeye, steelhead)
SMOLT:	Code SM; smolt Code YE; yearling (chinook) Code SSM; smolts seapen
ADULT:	

CDFO CWT Terms Defined

FIELD Type of Release
FILE CWT Releases
SOURCE CDFO

TERM DEFINITION

EXPERIMENTAL: Fish that have special or unusual rearing and/or release and/or incubation conditions for the facility. It is usually used for groups that are part of a formal experiment.

PRODUCTION: Represents typical hatchery production fish. That is, release date and time, rearing and incubation history have all been the usual for the facility in question.

BOTH: Small experiments where there are some minor changes in history. 'Both' is also used for experimental control fish and fed fry releases of coho.

INDEX: Used under international agreement for tagging on key streams.

PSC KEY: Reserved for possible use by PSC Technical Committees should key indicator stocks be defined.

CDFO CWT Terms Defined

FIELD Nature of Recovery Date
FILE CWT Recoveries
SOURCE CDFO

TERM	DEFINITION
-----	-----
CALCULATED:	The last day in the period that the fish were landed. For sport recoveries and the week is not known then it is the 15th of the month.
REPORTED:	Not used by CDFO.O

CDFO CWT Terms Defined

FIELD	Status of Record
FILE	CWT Catch/Samples
SOURCE	CDFO

TERM	DEFINITION
-----	-----
PRELIMINARY:	Data values before all pertinent information is known and before all error checking has been done. Analyses on such data, if any, must explicitly consider and state the scope of known limitations on the data. For Commercial, Test, statistics are based on sales slips to date. For sport fisheries this is based on heads received to date.
FINAL:	Data values after all pertinent information that will be collected has been collected and entered, and all standard error checking has been done. For Commercial and Test Fisheries, statistics are always based on actual fish tickets. There is no policy in effect prohibiting corrections to 'final' data.

CDFO CWT Terms Defined

FIELD	Stock
FILE	CWT Releases
SOURCE	CDFO

A stock is a group of fish originating from a single river; if a stock is transplanted to another system or facility for release, it will retain the original stock name until eggs are taken from progeny of the original release returning to the new system. At this point, the stock designation of the eggs will be that of the new system.

ODF&W CWT Terms Defined

FIELD	Status of Tag
FILE	CWT Recoveries
SOURCE	ODF&W

TERM	DEFINITION
-----	-----
Status 1:	Must be a valid tag code. Used also for a valid embedded replicate tag code even if replication digits are unreadable.
Status 2:	Head dug - no tag.
Status 3:	Head dug but tag lost.
Status 4:	Head dug but tag unreadable.
Status 7:	Blank or missing stripe on color tag, or not status 1, 2, 3, 4, or 8.
Status 8:	Snout lost or not processed.

ODF&W CWT Terms Defined

FIELD	Estimated Number
FILE	CWT Recoveries and Catch/Samples
SOURCE	ODF&W

An expansion factor is calculated for each observed recovery of a coded-wire tagged chinook, coho, or steelhead caught in an Oregon fishery in a time-area sampling stratum. This expansion factor is an estimate of the number of tagged fish caught in a fishery that one observed recovery of a coded-wire tag represents. By associating each observed recovery of a coded-wire tag with the estimated number it represents, the minimum estimated recoveries for any group of observed recoveries can be tabulated by summing their associated expansion factors. The resulting estimates are minimums, biased downwards by not sampling all strata of catch.

For each species caught in each stratum of sampling, the following three estimates are calculated:

Estimated Number of Ad-clipped Fish Caught in Stratum = (Total Catch)
 * (Number of Ad-clipped Fish in Sample / Number of Fish Sampled for Ad-clips)

Estimated Number of Coded-wire Tags in Stratum = (Estimated Number of Ad-clipped Fish Caught in Stratum) * (Number of Snouts Processed that contained CWTS / Number of Snouts Processed)

Estimated Number Coded Wire Tagged Fish Represented by One Observed Recovery = (Estimated Number of CWTs in Stratum) * (1 / Number of CWTs Processed and Decoded)

Sampling Area Strata:

For estimation of the single recovery expansion factor, the area strata are as follows: ocean troll and sport - by port of landing; Columbia River sport, gillnet and Indian - by above or below Bonneville Dam or in Youngs Bay; Lower Willamette River - one area from Columbia River to falls at Oregon City; Clackamas River - one area from Willamette River to River Mill Dam.

Sampling Time Strata:

The ocean fisheries, Columbia River gillnet and Indian fisheries, and Willamette and Clackamas River sport fisheries are stratified by statistical week. The Columbia River sport fishery is stratified by statistical month.

ODF&W CWT Terms Defined

FIELD	Awareness Factor
FILE	CWT Recoveries
SOURCE	ODF&W

Awareness factor is not used by ODF&W.

ODF&W CWT Terms Defined

FIELD Counting Method
FILE CWT Releases
SOURCE ODF&W

TERM	DEFINITION
-----	-----
Actual Count	Counts where individual fish are tallied either electronically or by hand count.
Book Value	Counts derived by deducting mortalities from previous lifestage estimates. The particular lifestage basis may vary by species and/or facility.
Petersen	Point estimates statistically calculated using a mark and recapture methodology.
By Weight	The number of individuals in a subsample of known mass or volume are extrapolated by the total mass or volume of the release lot.

ODF&W CWT Terms Defined

FIELD Run
FILE CWT Releases
SOURCE ODF&W

TERM DEFINITION

SPRING: Chinook which enter fresh water March through May and spawn August through October.

SUMMER:

FALL: Chinook which enter fresh water May through August and spawn October through December.

WINTER:

HYBRID:

LANDLOCKED:

ODF&W CWT Terms Defined

FIELD	Release Stage
FILE	CWT Releases
SOURCE	ODF&W

TERM	DEFINITION
-----	-----

EMERGENT FRY:

FED FRY: Coho > 250/lb.
 Chinook/fall > 125/lb. (1981 brood year)
 Chinook/spring > 125/lb. (1981 brood)
 Chinook/summer > 125/lb. (1981 brood)
 Steelhead/summer > 100/lb. (1981 brood)
 Steelhead/winter > 100/lb. (1981 brood)

FINGERLING: Chinook > 100/lb.
 Steelhead > 100/lb.
 Coho > 20/lb. and <= 250/lb. (1981 brood year)
 Chinook/fall > 20/lb. and <= 125/lb. (1981 brood)
 Chinook/spring > 16/lb. and <= 125/lb. (1981 brood)
 Chinook/summer > 10/lb. and <= 125/lb. (1981 brood)
 Steelhead/summer > 15/lb. and <= 100/lb. (1981 brood)
 Steelhead/winter > 15/lb. and <= 100/lb. (1981 brood)
 Chum all sizes

PRESMOLT: Coho > 20/lb. and <= 250/lb.
 Steelhead > 15/lb. and <= 100/lb.

SMOLT: Coho <= 20/lb.
 Chinook <= 30/lb.
 Steelhead <= 8/lb.
 Chum all sizes
 '0' smolt chinook > 39/lb. and <= 100/lb.
 '0' smolt steelhead > 8/lb. and <= 15/lb.
 Coho <= 20/lb. (1981 brood year)
 Chinook/fall <= 20/lb. (1981 brood)
 Chinook/spring <= 16/lb. (1981 brood)
 Chinook/summer <= 10/lb. (1981 brood)
 Steelhead/summer <= 15/lb. (1981 brood)
 Steelhead/winter <= 15/lb. (1981 brood)

ADULT:

ODF&W CWT Terms Defined

FIELD Type of Release
FILE CWT Releases
SOURCE ODF&W

TERM DEFINITION

EXPERIMENTAL: Representative of a group in an experiment.
PRODUCTION: Representative of the hatchery's production of that stock during that year.
BOTH: Representative of experimental and production fish.
INDEX: Representative of a large distribution study.
PSC KEY: Representative of either itself or more generally an aggregate of stocks exhibiting characteristic life history patterns in common. These life history characteristics determine among other biological parameters, the productivity of the group, and vulnerability to harvest of the aggregated group. The key indicator stocks are marked with means to identify these fish in the catch (international, national, state, and provincial fisheries). From these recoveries certain life history characteristics and harvest vulnerability will be described and attributed to the larger common aggregate. Marking and recovery techniques are to conform to criteria established by Pacific Salmon Commission in order to maintain consistency with analytical procedures adopted by the various technical committees of the Commission.

ODF&W CWT Terms Defined

FIELD Nature of Recovery Date
FILE CWT Recoveries
SOURCE ODF&W

TERM DEFINITION

CALCULATED: Not used by ODF&W.

REPORTED: Date fish were sampled.

ODF&W CWT Terms Defined

FIELD	Status of Record
FILE	CWT Catch/Samples
SOURCE	ODF&W

TERM	DEFINITION
-----	-----
PRELIMINARY:	CWT data has been error checked per PSC format validation but expansions have been calculated using preliminary catch data.
FINAL:	All data error checked per PSC format validation and are considered to be final and complete.

ODF&W CWT Terms Defined

FIELD	Stock
FILE	CWT Releases
SOURCE	ODF&W

"Stock" means fish spawning in a particular area at a particular time which do not interbreed, to any substantial degree, with any group spawning in a different area or in the same area at a different time. Fish of the same species in adjacent rivers may be managed as a single stock.
[OAR 635-07-051 (34)]

For management purposes, Oregon recognizes the following "stock types":

WILD

Type A: significant genetic value and "pristine".

Type B: naturally spawned and reared regardless of parental type.

HATCHERY

Type C: fish from wild parents, spawned in a hatchery and reared in the wild.

Type D: fish from a hatchery stock or reared in the hatchery for extended time prior to release.

[Paraphrased from OAR section (35)]

WDF CWT Terms Defined

FIELD	Status of Tag
FILE	CWT Recoveries
SOURCE	WDF

TERM	DEFINITION
---	-----
Status 1:	Tag was successfully decoded with a valid value. Used also for a valid embedded replicate tag code even if replication digits are unreadable.
Status 2:	No tag was found in head.
Status 3:	Tag was extracted from head but was lost before being decoded or verified.
Status 4:	Tag was extracted from head but could not be read because it was mutilated.
Status 7:	An Unresolved Discrepancy is coded in the following circumstances: <ul style="list-style-type: none"> * reused tag code * specifies positively identified by sampler does not match species tagged when tag is decoded and verified.
Status 8:	Ad-clipped fish were identified by a sampler, but the heads was never received at the tag lab.
- NOTE -	A decision has not been made about the status to assign recoveries for which the tag is successfully decoded and found to be an embedded replicate tag, but the replicate value is unavailable due to mutilation, ambiguity, or readers unaware of embedded coding. This value may be handled by assignment of a special replicate value such as R0 ("R-zero") and a status of "1".

WDF CWT Terms Defined

FIELD	Estimated Number
FILE	CWT Recoveries and Catch/Samples
SOURCE	WDF

WDF concurs with the ADF&G definitions with one clarification. The Estimated Number formula:

$$(N / N2) * (M1 / M2) * (A1 / A2)$$

is only applied to an individual recovery WITH A DECODED TAG. Lost tag and no tag recoveries can have estimated numbers computed for them; the formula lacks the middle term in such cases.

Common WDF stratifications are:

Ocean troll, ocean sport, Puget Sound sport:
area/st. month/species

Puget Sound net, coastal net, freshwater net:
area/st. week/species

Freshwater sport: area/calendar month/species

Escapement: area/season (year)/species

WDF CWT Terms Defined

FIELD Awareness Factor
FILE CWT Recoveries
SOURCE WDF

Awareness is defined as the probability that a sports fisherman will turn in the head of an adipose-clipped fish to a designated voluntary recovery site. This factor takes into account the awareness of the individual that clipped fish exist in the fishery, the ability of an individual to accurately identify a clipped adipose fin, and the effort an individual undertakes to ensure that good intentions are acted upon before the head is otherwise disposed of.

The assumption in awareness factor calculations is that the proportion of tagged fish found in the port of the sports fishery sampled by agency-trained samplers is equal to the proportion of tagged fish in the remainder of the fishery.

If we set

V = number of voluntary recoveries turned in
R = number of insample recoveries
S = number of fish sampled by agency-trained samplers
U = unsampled fish (Total catch minus S)

then awareness factor A is simply

$$A = V / [(R / S) * U]$$

WDF CWT Terms Defined

FIELD	Counting Method
FILE	CWT Releases
SOURCE	WDF

WDF concurs with the ADF&G definitions as stated.

WDF CWT Terms Defined

FIELD	Run
FILE	CWT Releases
SOURCE	WDF

Run is a term that is not easily defined for Washington State, in general. For example, while spring chinook runs returning to the West Coast of Washington are usually defined by their geographic location of spawning, runs in the Columbia River and Puget Sound tend to be defined primarily by their entry time into spawning streams. Temporal differences in entry timing from one basin to another is often quite marked, making generalized definitions meaningless.

Even a detailed, basin by basin definition of Run would not provide very good resolution of the dilemma, since there is currently some disagreement about the best way to differentiate Run in areas such as Puget Sound streams, where advances in genetic stock identification may eventually permit much more definitive Run determinations than those based on entry timing alone. The need to clarify Run definition is an ongoing goal of those in our Harvest Management Division.

In Washington, we often refer to summer and fall chinook collectively as a Summer/Fall chinook. However, these runs are generally coded as Fall chinook in the PSC formatted data.

In summary, Washington State defines Run on a species and basin-specific basis which is not conducive to generalized definitions at present.

WDF CWT Terms Defined

FIELD Release Stage
FILE CWT Releases
SOURCE WDF

TERM DEFINITION

EMERGENT FRY: Code 1; unfed fry (days reared = 1).

FED FRY: Code 2; chum and pink, 2 days or older.

FINGERLING: Code 3; coho and steelhead less than one year old; chinook before August 1 and one year old.

PRESMOLT: Code 4; fall release; chinook after August 1.

SMOLT: Code 5; yearling; coho and chinook older than one year; steelhead older than 200 days and planted in January through February.

ADULT: Code 6; extended coho planted after June 1 and older than one year; WRIA = 8-17.

WDF CWT Terms Defined

FIELD Type of Release
FILE CWT Releases
SOURCE WDF

TERM	DEFINITION
-----	-----
EXPERIMENTAL:	Code 3; stock assessment (out of state or stock crosses) Code 4; time/size Code 7; genetic research Code 13; adult mortality Code 14; tag retention Code 18; saltwater acclimation Code 25; coagulated yolk Code 27; release timing Code 29; temperature control Code 31; experimental
PRODUCTION:	Code 2; production assessment Code 12; wild stock assessment Code 15; endangered stock Code 17; egg bank program Code 21; ocean management Code 28; fry plant
BOTH:	Code 5; density Code 6; diet research Code 8; disease prevention Code 9; fish passage Code 10; transport analysis Code 11; control group Code 16; survival evaluation Code 19; substrate incubation Code 23; adult return timing Code 30; volitional
INDEX:	Code 1; 5% production assessment Code 20; coho index Code 24; coastal index Code 26; Columbia River index Code 32; chinook index Code 33; US-Canada indicator
PSC KEY:	Reserved for possible use by PSC Technical Committees should key indicator stocks be defined.

WDF CWT Terms Defined

FIELD Nature of Recovery Date
FILE CWT Recoveries
SOURCE WDF

WDF concurs with ADF&G in their definitions of terms. We don't foresee the use of calculated date. We would note that reported date is the date caught (not sampled) for voluntary sports recoveries.

WDF CWT Terms Defined

FIELD	Status of Record
FILE	CWT Catch/Samples
SOURCE	WDF

WDF concurs with ADF&G in their definitions of terms. We would add under PRELIMINARY that catch files are not just unchecked but generally incomplete at this stage. During error checking, there are usually some records found that have not been previously entered into the database.

In addition, our FINAL data are not FINAL until the appropriate section of our Harvest Management Division has had the opportunity to review the figures and reconcile with other information they may have from catch sampling.

WDF CWT Terms Defined

FIELD	Stock
FILE	CWT Releases
SOURCE	WDF

A stock is a group of fish originating from a single river; if a stock is transplanted to another system or facility for release, it will retain the original stock name until eggs are taken from progeny of the original release returning to the new system. At this point, the stock designation of the eggs will be that of the new system.

APPENDIX 4.4

LOCATION CODING SCHEME: ALASKA DEPARTMENT OF FISH AND GAME

A 19-character location strip is being used by all parties to the Pacific Salmon Treaty to geographically identify the locations of salmon stocks, hatcheries, release sites, recovery sites and sampling sites, coastwide.

In Alaska the following outline describes the conventions used in coding each part of the location strip. In general, the schemes follow existing formats defined by Division of Commercial Fisheries and Division of Habitat. Data collected under authority of Division of FRED and Division of Sportfish have generally been mapped into the Commercial Fisheries scheme.

LEVEL 0 (col. 1) State: 1 = Locations defined by Alaska entities.

LEVEL 1 (col. 2) Water Type: M = Marine-based location.
F = Freshwater-based location.

LEVEL 2 (col. 3) Region: Salmon Management Region number
 1 = Southeast Alaska
 2 = Southcentral Alaska
 3 = Arctic-Yukon-Kuskokwim
 4 = Westward
 * = Alaska code for a location outside
 of Alaska (users may need to
 combine or convert these for
 coastwide analysis).

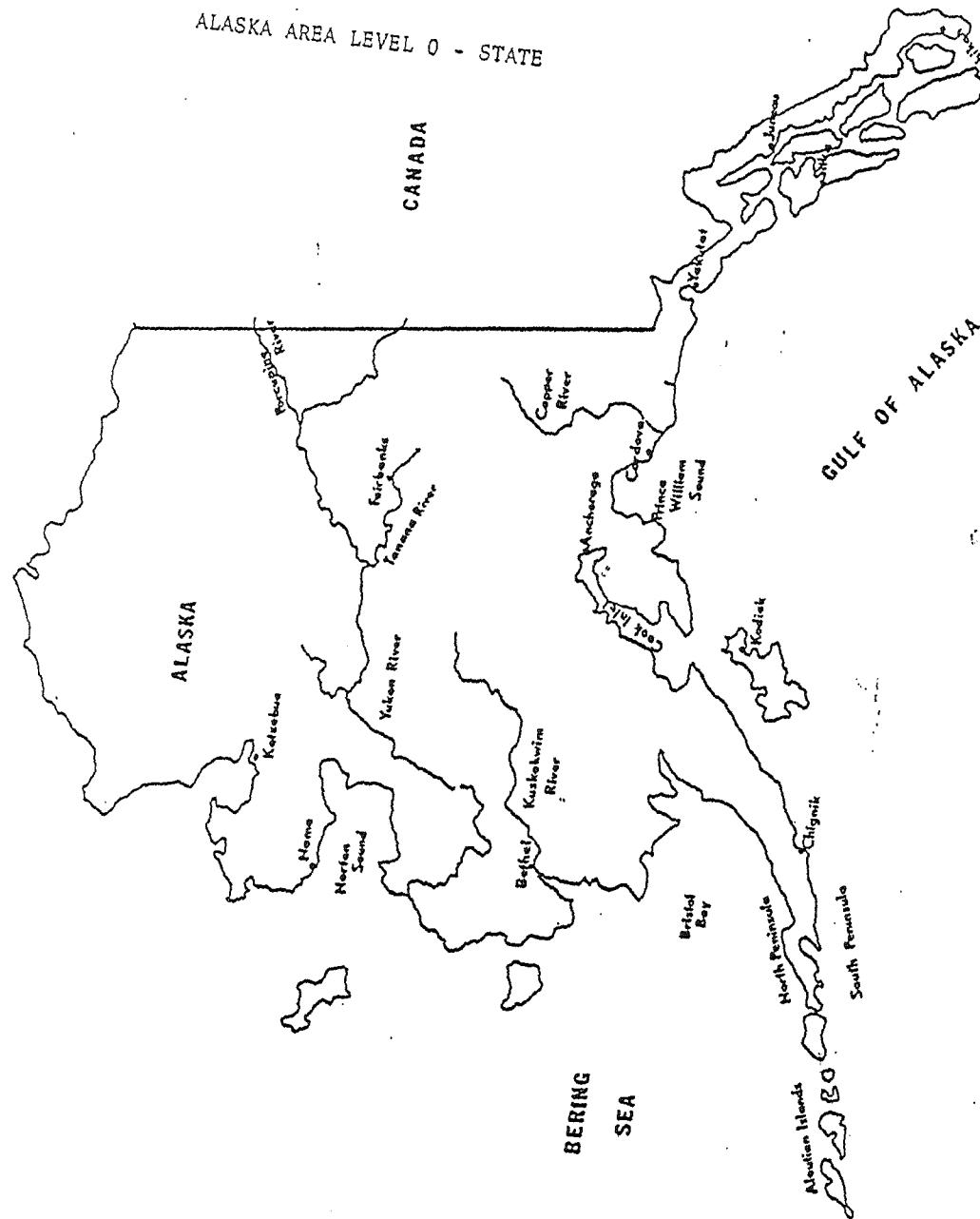
LEVEL 3 (cols. 4-5) Quadrant: Quadrants are currently defined only for Region 1.
SE = Southeast
SW = Southwest
NE = Northeast
NW = Northwest

LEVEL 4 (cols. 6-9) District: Three digit statistical area.

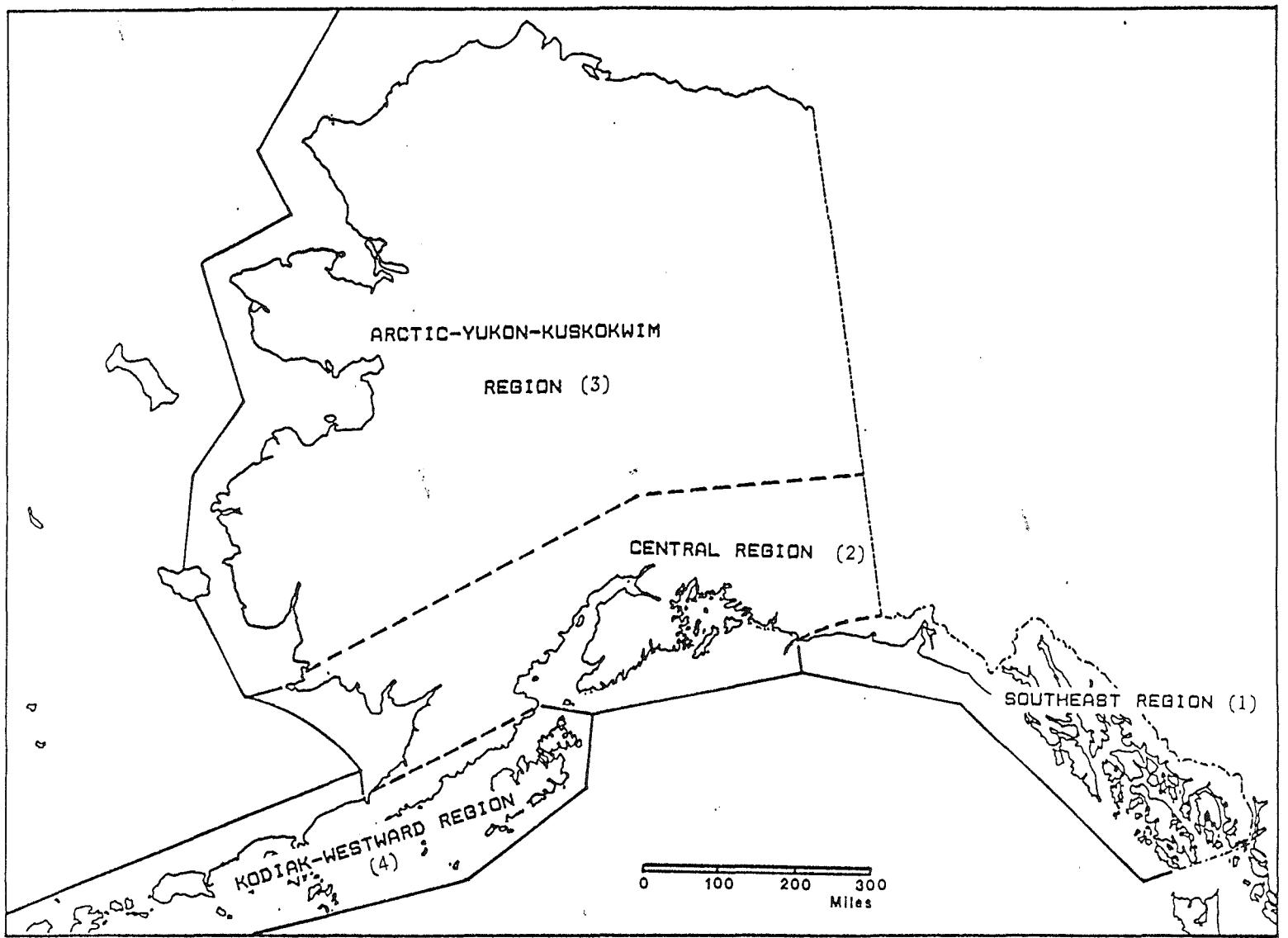
LEVEL 5 (cols. 10-16) Subdist: Two digit statistical subarea concatenated to five digit Habitat Stream Code. For data of water type 'M' the Stream Code is generally omitted. It is important to note that ADF&G's Habitat Stream Codes are not identical to ADF&G Commercial Fisheries Region 1 Stream Codes.

LEVEL 6 (cols. 17-19) Substrm: Three digit Habitat Stream Code at level two. The leading "2" from the code is always omitted. In cases where the substream code does not give sufficient resolution to pinpoint the location, a unique three digit code is generated and assigned by the Alaska Tag Coordinator.

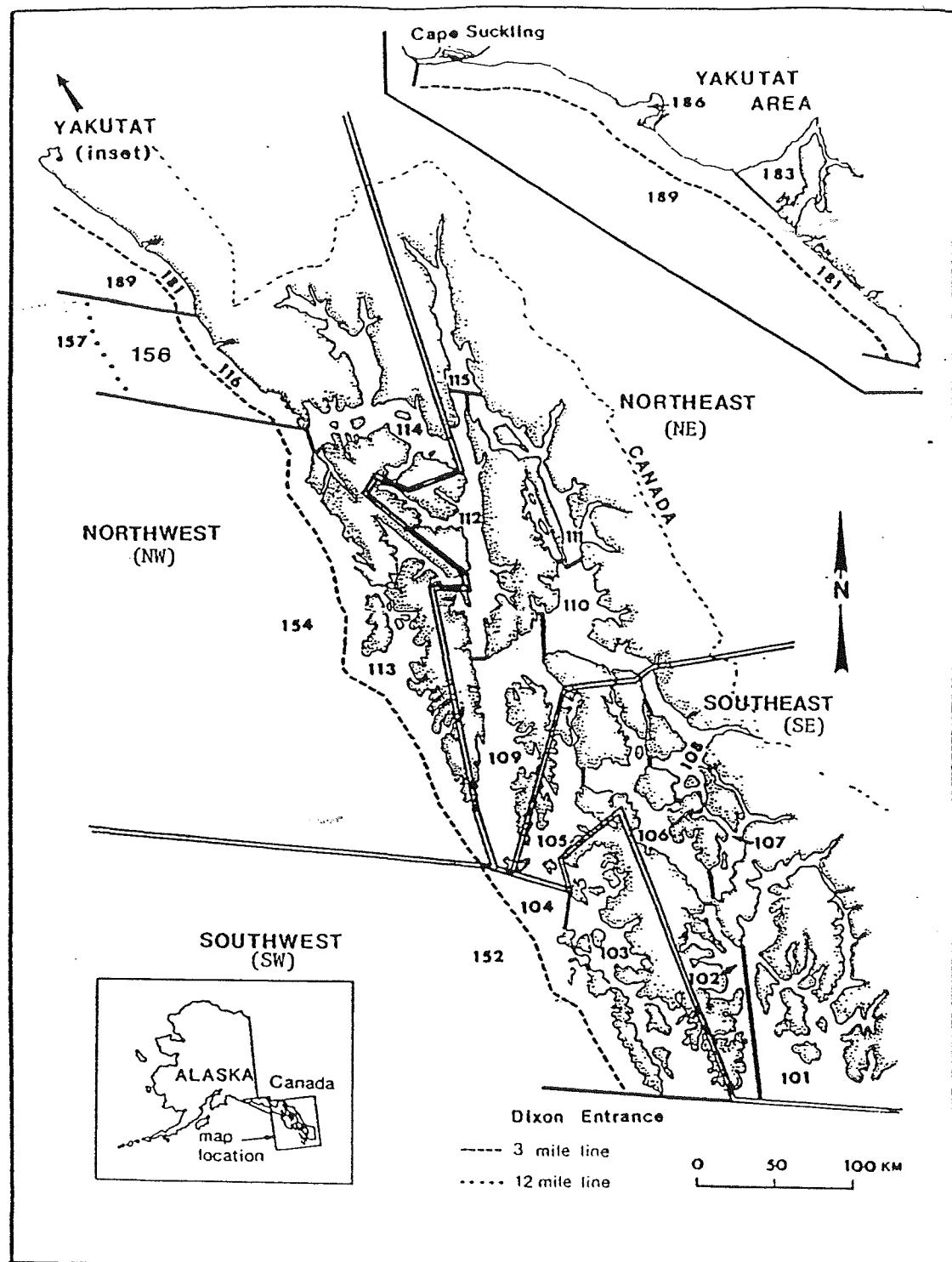
ALASKA AREA LEVEL 0 - STATE



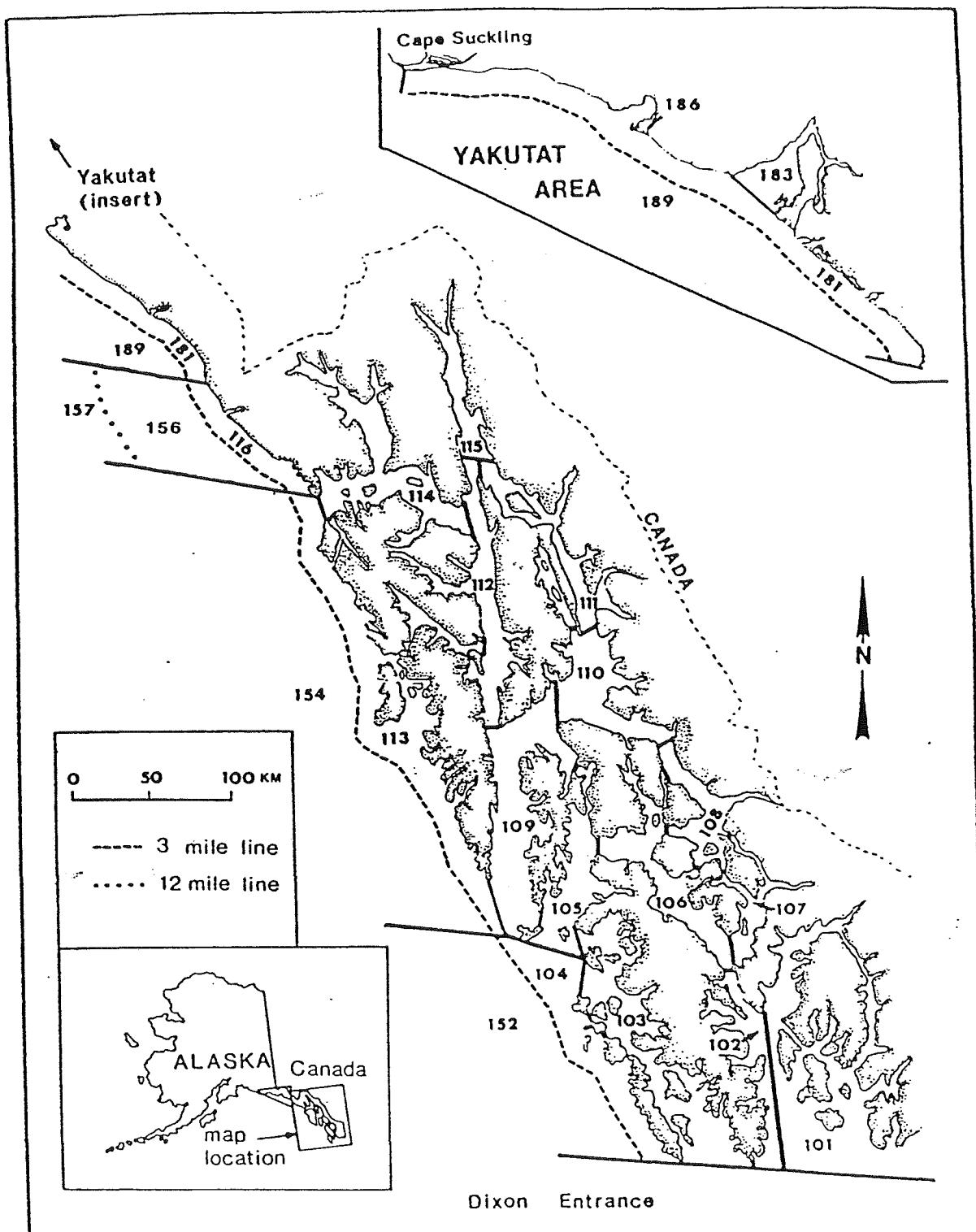
ALASKA AREA LEVEL 2 - REGIONS



ALASKA AREA LEVEL 3 - QUADRANTS

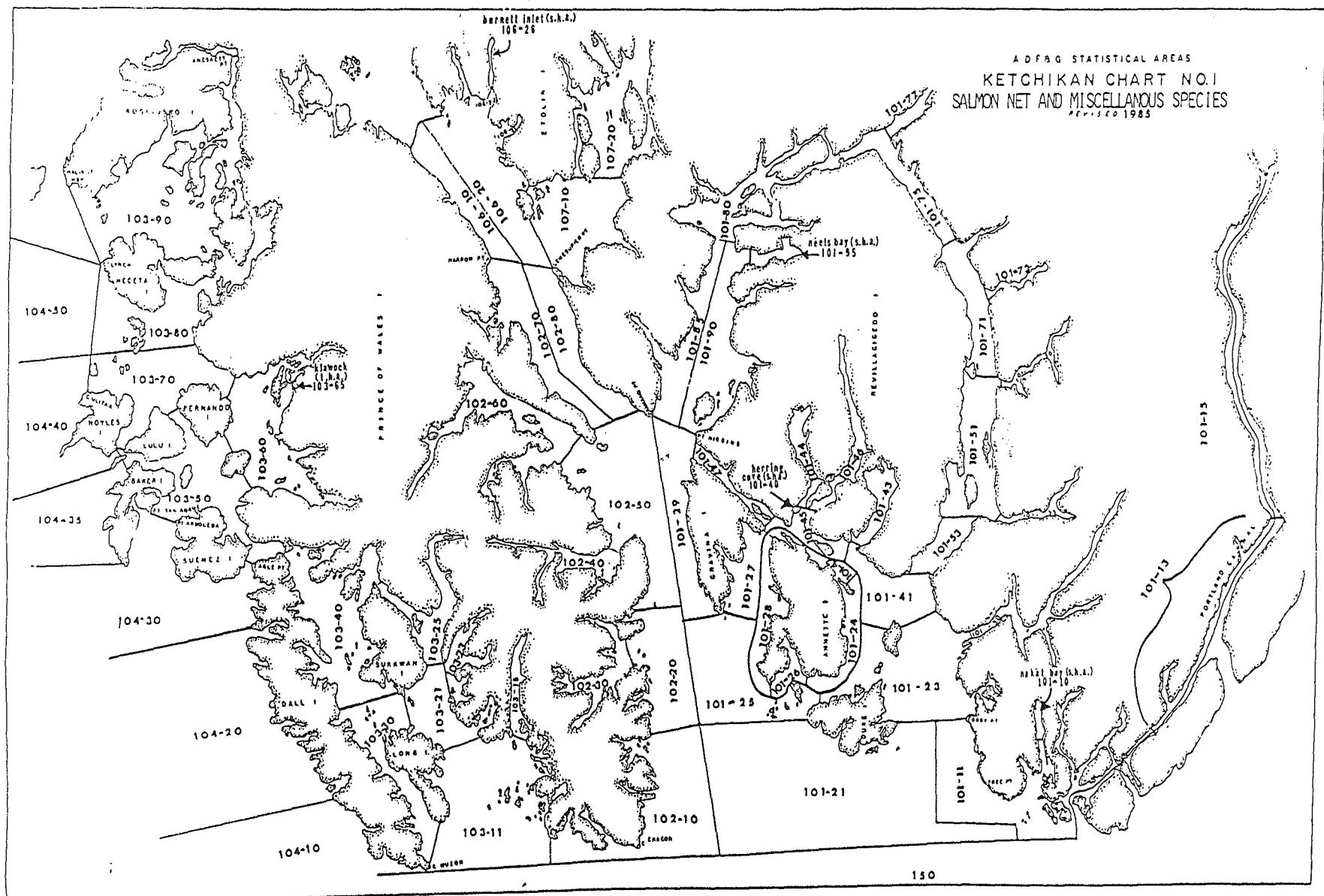


ALASKA AREA LEVEL 4 - DISTRICTS (synonymously STAT AREAS)

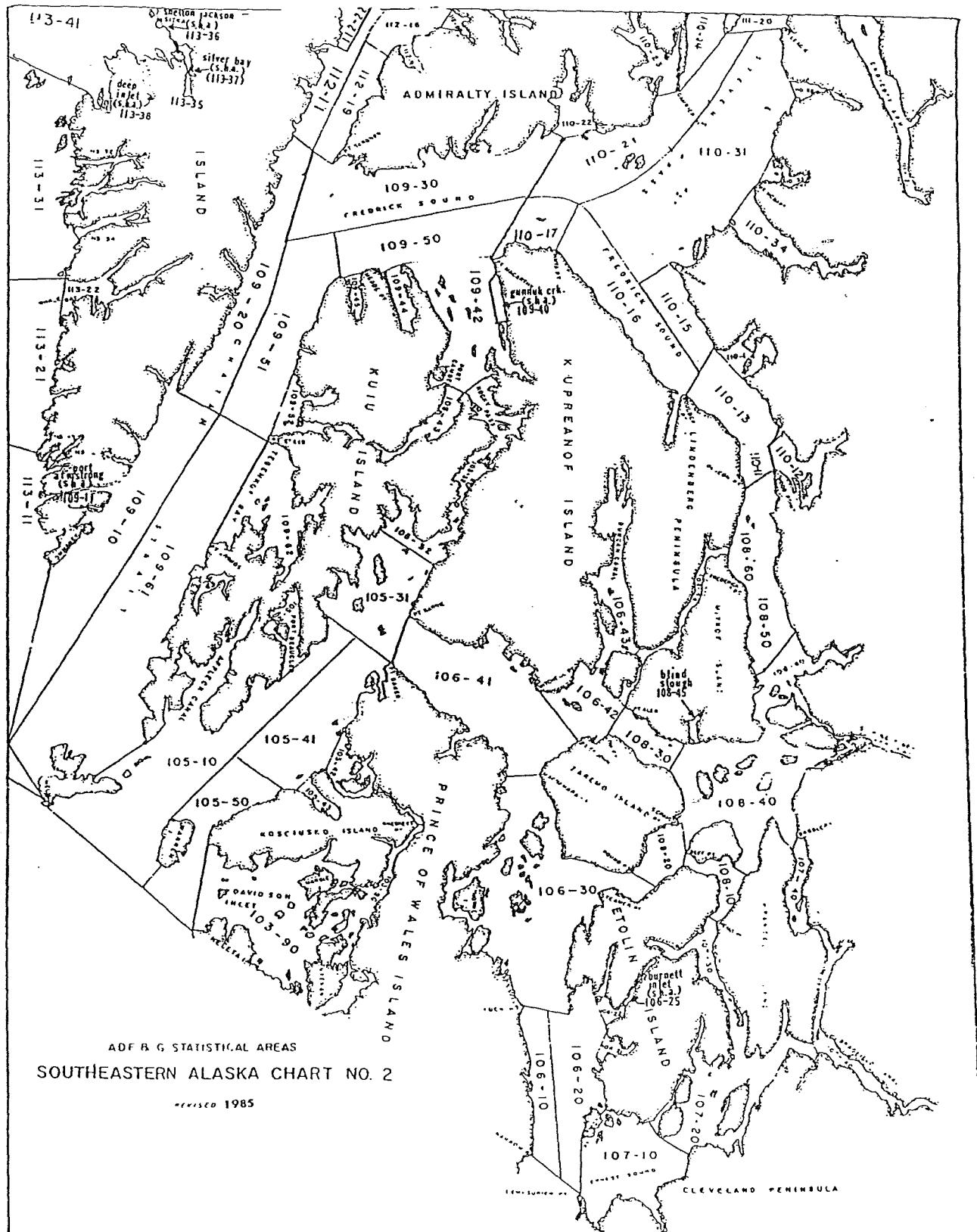


ALASKA AREA LEVEL 5 - SUBAREAS (1 of 3)

A D F A G STATISTICAL AREAS
 KETCHIKAN CHART NO. 1
 SALMON NET AND MISCELLANEOUS SPECIES
Period 1985

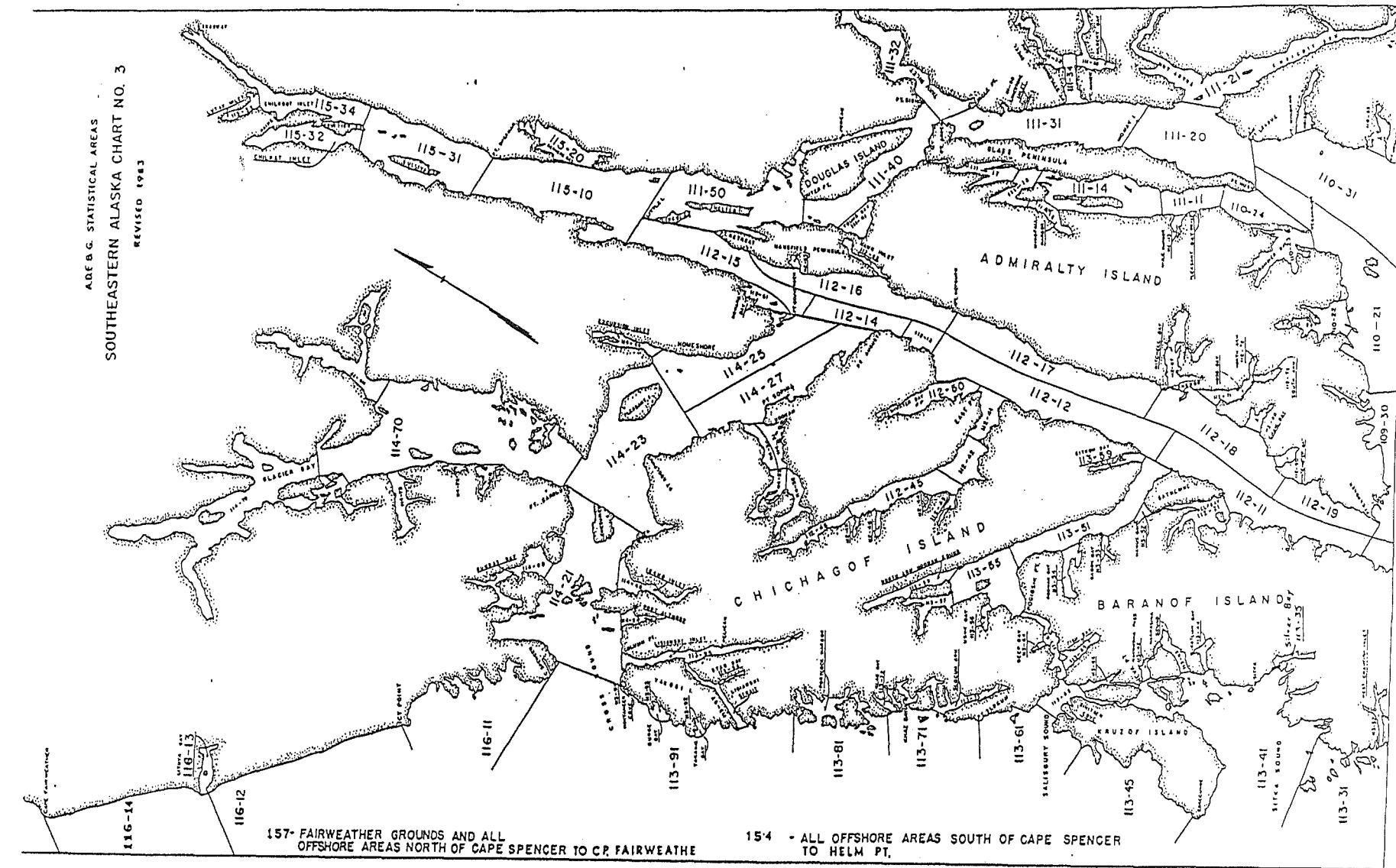


ALASKA AREA LEVEL 5 - SUBAREAS (26 of 3)



ALASKA AREA LEVEL 5 - SUBAREAS (3 of 3)

ADFG. STATISTICAL AREAS
SOUTHEASTERN ALASKA CHART NO. 3
REVISED 1981



ALASKA LEVEL 5B (Stream) and 6 (Substream)

			Stream/Lake	Map Sheet	Lat./Long.	Legal
111-32	10320	2021	Moose Creek	TAKU RIVER C-6	58 31 43 133 50 33 58 33 3 133 50 28	C 38S 70E34 C 38S 70E27
111-32	10320	2021-3008		TAKU RIVER C-6	58 32 29 133 48 49 58 32 59 133 47 31	C 38S 70E26 C 38S 70E25
111-32	10320	2021-3008-4004		TAKU RIVER C-6	58 32 36 133 47 35 58 32 51 133 46 52	C 38S 70E25 C 38S 70E25
111-32	10320	2021-3012		TAKU RIVER C-6	58 33 1 133 49 41 58 33 23 133 49 29	C 38S 70E27 C 38S 70E22
111-32	10320	2024	Yehring Creek	TAKU RIVER C-6	58 30 6 133 47 3 58 30 0 133 43 47	C 39S 70E12 C 39S 71E 8
111-32	10320	2024-3004		TAKU RIVER C-6 TAKU RIVER B-6	58 30 16 133 45 36 58 29 43 133 46 32	C 39S 71E 7 C 39S 70E13
111-32	10320	2032	Wright River	TAKU RIVER C-6 TAKU RIVER C-5	58 31 44 133 44 24 58 30 5 133 39 39	C 38S 71E31 C 39S 71E10
111-32	10320	2052	Fish Creek	TAKU RIVER C-6 TAKU RIVER C-5	58 32 37 133 40 52 58 32 11 133 38 11	C 38S 71E27 C 38S 71E35
111-32	10780	2010	Davidson Creek	TAKU RIVER B-6	58 21 9 133 59 26 58 22 18 133 51 29	C 40S 69E34 C 40S 70E28
111-32	10780	2010		TAKU RIVER B-6	58 22 3 133 54 57 58 22 16 133 53 51	C 40S 70E31 C 40S 70E29
111-32	10800	2010	Turner Creek	TAKU RIVER B-6	58 18 57 133 58 4 58 18 49 133 57 36	C 41S 70E16 C 41S 70E15
111-32	10990	2005		JUNEAU A-1	58 7 27 134 2 21 58 6 28 134 0 16	C 43S 70E19 C 43S 70E29
111-32	10990	2005		JUNEAU A-1 TAKU RIVER A-6	58 6 48 134 1 12 58 7 48 133 57 32	C 43S 70E30 C 43S 70E22
111-33	10080			TAKU RIVER A-6	58 2 2 133 48 28 58 2 3 133 49 22	C 44S 71E21 C 44S 71E21
111-33	10100		Prospect Creek	TAKU RIVER A-6	58 2 52 133 48 17 58 4 36 133 51 2	C 44S 71E16 C 44S 71E 8
111-33	10300	2010	Speel River	TAKU RIVER A-6 TAKU RIVER A-5	58 8 4 133 42 55 58 11 30 133 34 8	C 43S 71E24 C 42S 72E36
111-33	10300	2014		TAKU RIVER A-5	58 11 57 133 33 43	C 42S 72E25
111-34	10200			TAKU RIVER A-5	58 9 34 133 37 14 58 9 12 133 36 16	C 43S 72E10 C 43S 72E11
111-34	10220			TAKU RIVER A-6	58 1 19 133 44 27 58 2 4 133 44 10	C 44S 71E25 C 44S 71E24
111-34	10220			TAKU RIVER A-6	58 0 58 133 43 52 58 2 31 133 42 58	C 44S 71E36 C 44S 71E24
111-34	10240			TAKU RIVER A-6	58 0 48 133 43 42 58 1 11 133 43 3	C 44S 71E36 C 44S 71E25
111-34	10400			SUMDUM D-6	57 57 36 133 49 57 57 57 35 133 49 11	C 45S 71E24 C 45S 72E19
111-34	10410			SUMDUM D-6	57 57 36 133 49 57 57 57 15 133 49 32	C 45S 71E24 C 45S 72E19
111-35	10050	2032	Whiting River	TAKU RIVER A-6 TAKU RIVER A-5	58 0 0 133 41 29 58 9 21 133 20 39	C 45S 72E 1 C 43S 74E 8
111-35	10050	2032-0010		TAKU RIVER A-5 TAKU RIVER A-4	58 9 12 133 20 29 58 10 3 133 18 26	C 43S 74E 8 C 43S 74E 3
111-35	10050	2035		TAKU RIVER A-4	58 10 9 133 18 7	C 43S 74E 3
111-35	10050	2035-0010	Crescent Lake	TAKU RIVER A-5	58 9 21 133 20 39 58 12 23 133 30 18	C 43S 74E 8 C 42S 73E29
111-35	10050	2035-0020		TAKU RIVER A-5	58 12 0 133 19 32	C 42S 74E28
111-35	10050	2035-3007		TAKU RIVER A-5	58 12 21 133 30 32	C 42S 73E29
111-35	10050	2035-3013		TAKU RIVER A-4	58 11 53 133 19 40 58 11 44 133 20 0	C 42S 74E28 C 42S 74E28
111-35	10170			TAKU RIVER A-5	58 12 29 133 23 19 58 11 56 133 23 27	C 42S 73E24 C 42S 73E25
111-35	10200		Sweetheart Creek	SUMDUM D-6	57 57 46 133 41 32 57 58 1 133 40 0	C 45S 72E14 C 45S 72E13
111-35	10320		Gilbert Creek	SUMDUM D-6	57 56 38 133 41 6 57 56 44 133 40 28	C 45S 72E25 C 45S 72E25
				SUMDUM D-6	57 55 54 133 40 51 57 54 33 133 40 20	C 45S 72E36 C 46S 72E 1

LOCATION CODING SCHEME: CANADA DEPARTMENT OF FISHERIES AND OCEANS

A 19-character location strip is being used by all parties to the Pacific Salmon Treaty to geographically identify the locations of salmon stocks, hatcheries, release sites, recovery sites and sampling sites, coastwide.

LEVEL 0 (col. 1) Province: 2 = Locations defined by Canada

LEVEL 1 (col. 2) Water Type: M = Marine-based location.
 F = Freshwater-based location.

LEVEL 2 (col. 3) Location: General geographical location.
 N = Location is north of Cape Caution.
 S = Location is south of Cape Caution.
 * = Canadian code for a location outside
 of Canada (users may need to
 combine or convert these for
 coastwide analysis).

LEVEL 3 (cols. 4-5) Catch Region: Fishery in which the event occurred.
 For marine fisheries, implies both a
 geographic location and a gear.
 For freshwater events, implies only a
 generic fishery.
 Level 3 is the expansion level for marine
 events. On marine events, levels 4 through
 6 may be blank.

CR Abbr.	Name
01 NWTR	Northwest Vancouver Island Troll
02 SWTR	Southwest Vancouver Island Troll
03 WOT	Wash-Oregon Troll. Historical
04 GSTR	Georgia Strait Troll
05 CTR	Central Troll
06 NTR	Northern Troll
07 ATR	Alaska Troll. Historical
08 FGN	Fraser River Gill Net.
09 NN	Northern Net
10 GSN	Georgia Strait Net
11 JSN	Johnstone Strait Net
12 CN	Central Net
13 JFN	Juan De Fuca Net
14 JFTR	Juan De Fuca Troll

15 NWTR & CTR
17 NWTR & SWTR
18 NTR &CTR
19 JSN & CN
20 NWVN Northwest Vancouver Island Net
21 SWVN Southwest Vancouver Island Net
25 NSPT Northern Sport
26 CSPT Central Sport
27 WSPT West Coast Vancouver Island Sport
28 GSPT Georgia Strait Sport
33 NN & CN
34 GSTR & CTR
36 YKN
37 JFN & GSN
45 JSN & GSN
46 FGN & GSN
47 AN Alaska Net. Alaskan fish landed and sampled in Canada.
48 BC BC Unknown
53 GSTR & SWTR
56 NCTR North Central Troll
57 SCTR South Central Troll
58 FSN Fraser Seine
60 WAN Washington Net. Washington fish landed and sampled in Canada.
90-99 Freshwater catch regions.
97 FWSP Freshwater Sport.
99 Escapement

LEVEL 4 (cols. 6-9) Marine events: 3 character Statistical area.
 Freshwater events: 4 character Production area.

LEVEL 5 (cols. 10-16) Usage varies, dependant on Level 1

Level 1 = M : Alpha location code, sport data.

= F : Column 10 carries site type code.

H = Hatchery

R = Release/Recovery site

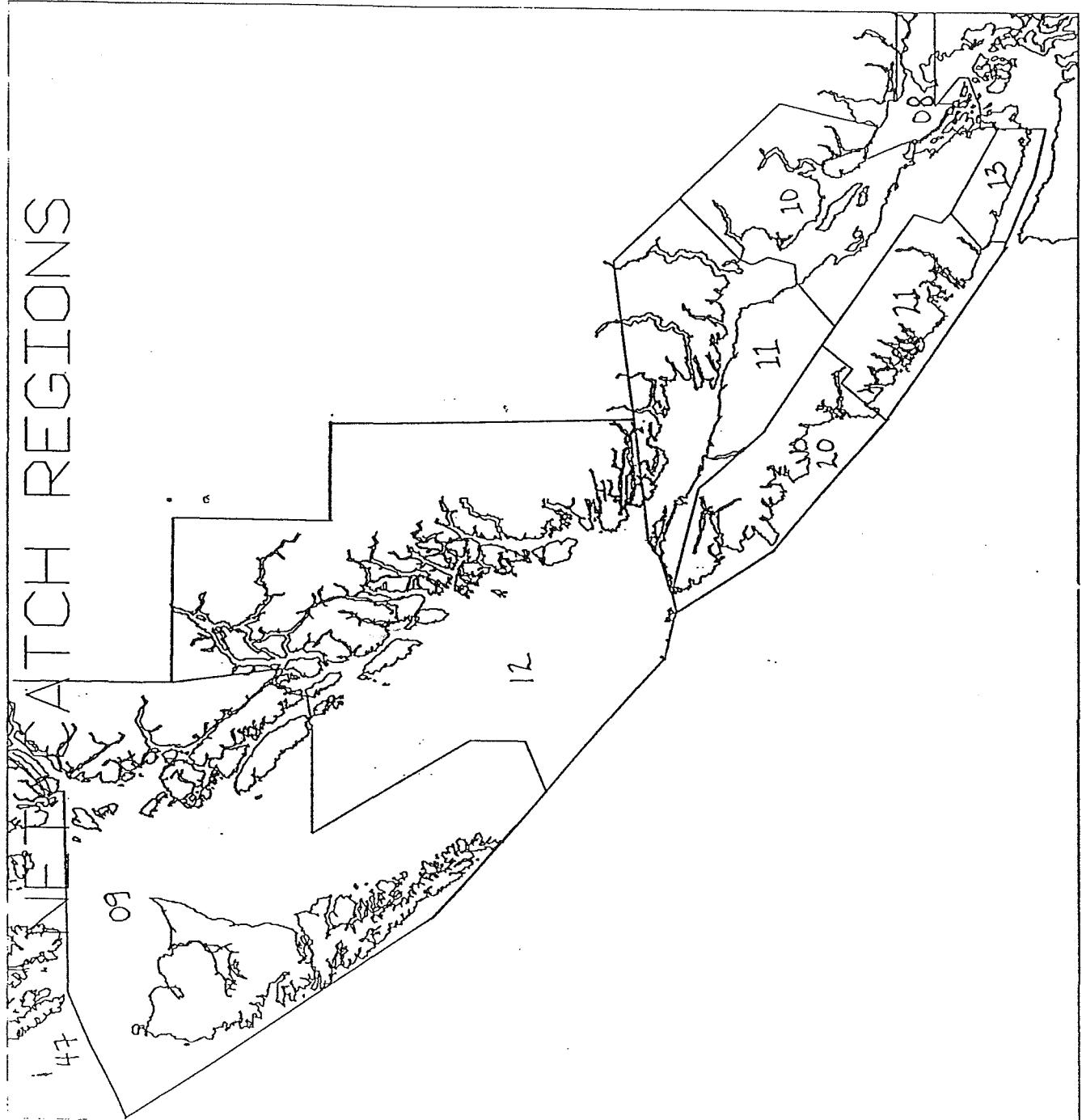
Columns 11-14 carry site number.

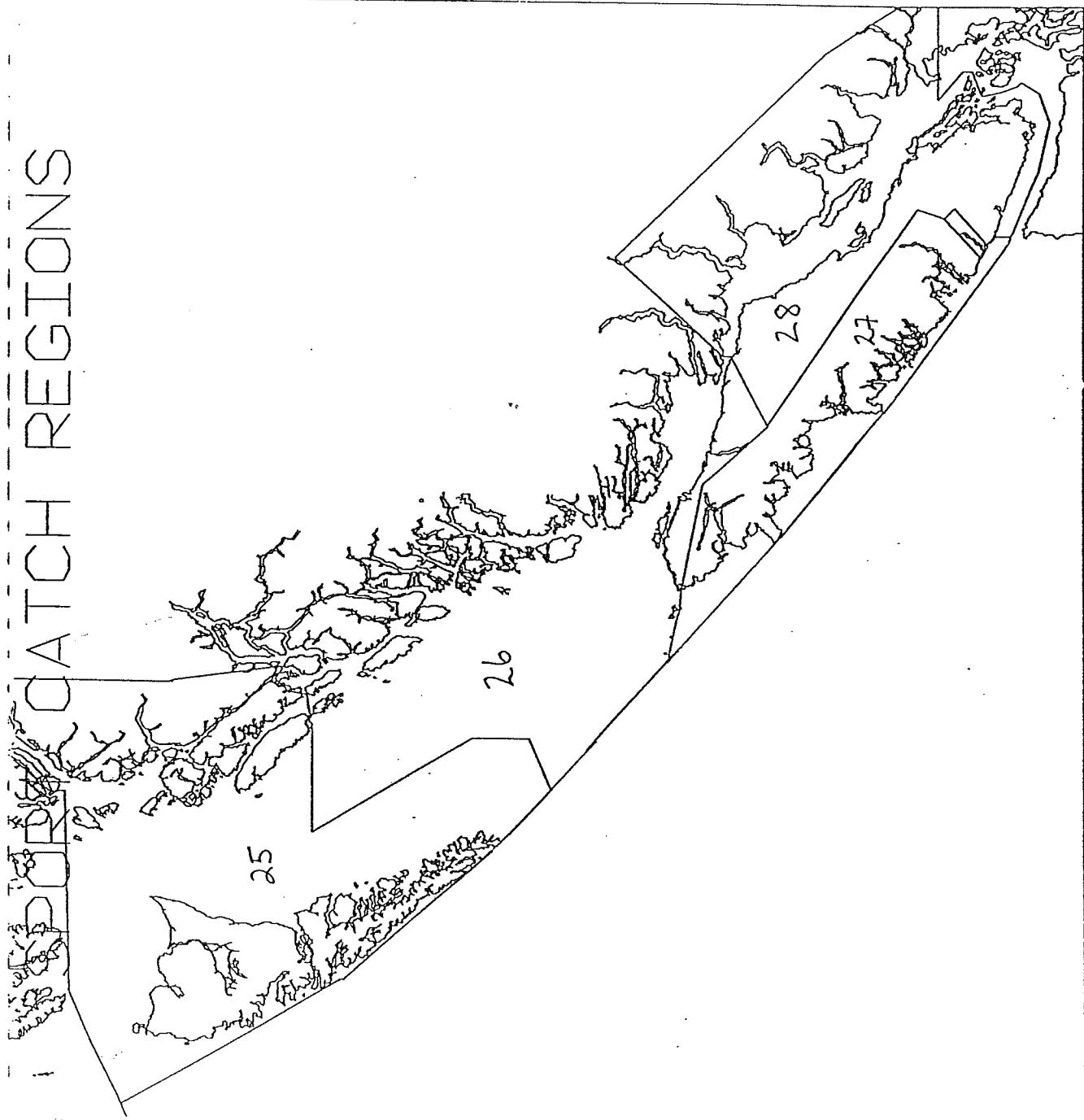
Level 5 is the expansion level for freshwater events.

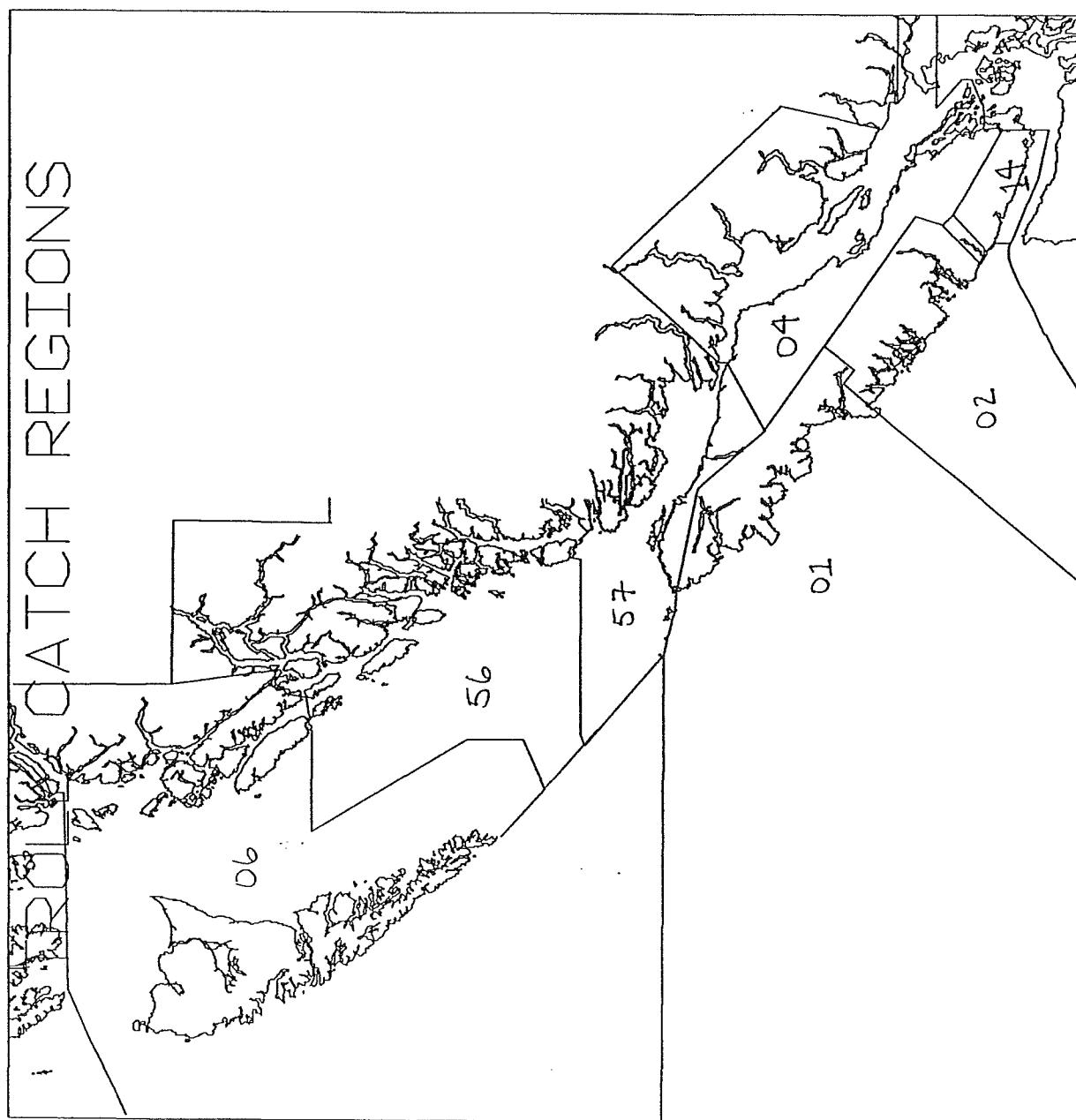
LEVEL 6 (cols. 17-19) Usage varies, dependant on Level 1.

Level 1 = M : Contains Subarea code.

= F : Field not used.







LOCATION CODING SCHEME: OREGON DEPARTMENT OF FISH AND WILDLIFE

A 19-character location strip is being used by all parties to the Pacific Salmon Treaty to geographically identify the locations of salmon stocks, hatcheries, release sites, recovery sites and sampling sites, coastwide.

In Oregon the following outline describes the conventions used in coding each part of the location strip.

LEVEL 0 (col. 1) State: 5 = Locations defined by Oregon entities.

LEVEL 1 (col. 2) Water Type: M = Marine-based location. Recoveries and catch/samples in fisheries 10, 11 and 19 are always coded 'M'. Release Sites where stream code is '01 001 00000' are always coded 'M'. F = Freshwater-based location. 'F' is coded in all locations not covered by 'M' above.

LEVEL 2 (col. 3) Sector: 2 = Coastal
 3 = Columbia River
 * = Oregon code for a location outside
 of Oregon (users may need to
 combine or convert these for
 coastwide analysis).

LEVEL 4 (cols. 6-9) Stat Area: Mark summary area code (i.e. catch/sample area code). Individual recoveries are always expanded at this level

LEVEL 5 (cols. 10-16) Location: For release sites, Public IBM stream code (watershed segment, basin segment, main stream segment, contributor segment) or Private fishery and area. For hatchery, 'H' followed by hatchery code. For stock, stock code. For recovery site, at Hatchery 'H' followed by area code, at a river 'R' followed by area code, at open ocean 'O' followed by area code. For catch/samples, 'H' = hatchery, 'R' = river, 'O' = ocean.

LEVEL 6 (cols. 17-19) Sub-loc: For release sites, IBM stream code feeder segment. For stock, not used. For other purposes, fishery code.

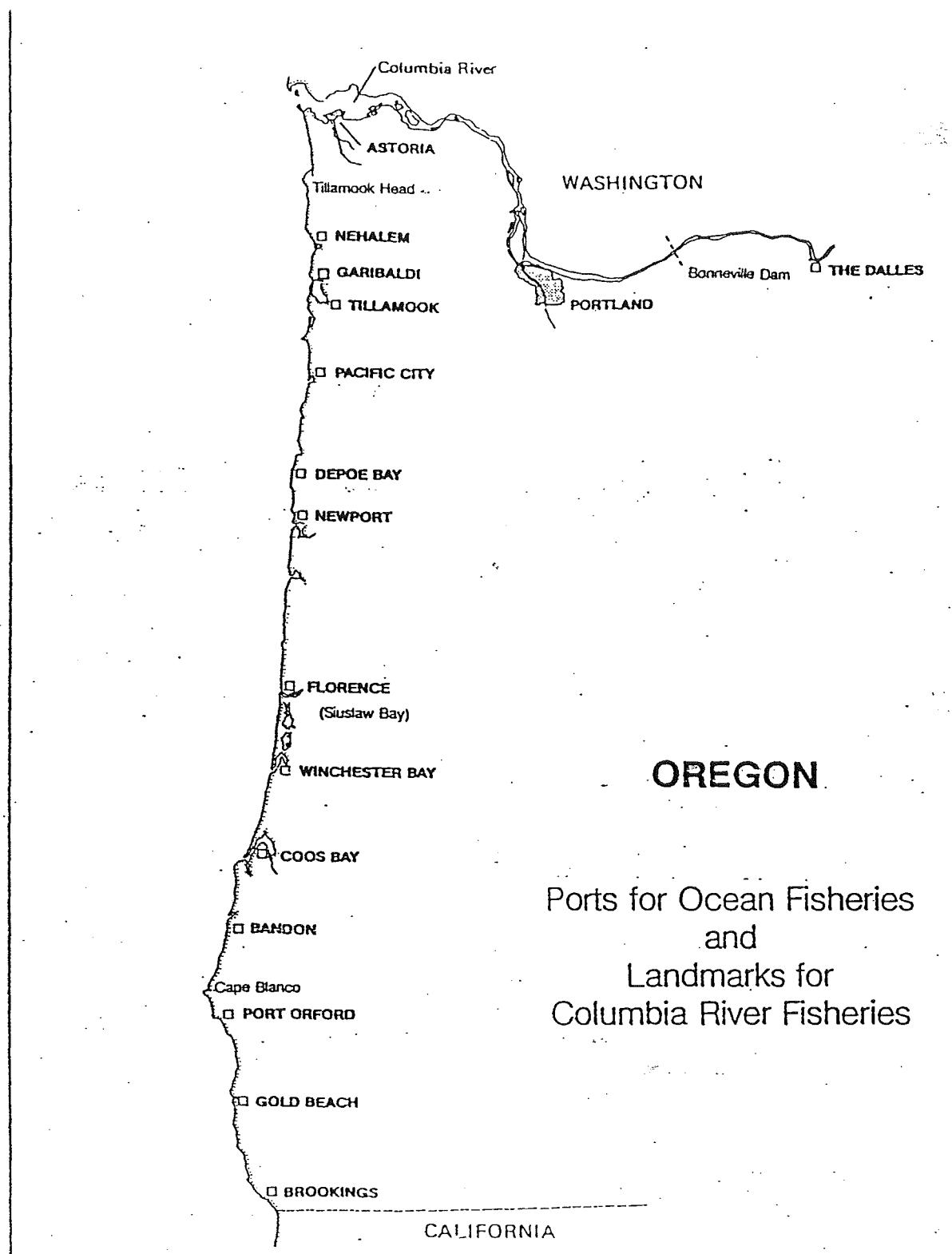


Figure 1. Oregon ports for ocean fisheries and landmarks for Columbia River fisheries.

LOCATION CODING SCHEME: WASHINGTON DEPARTMENT OF FISHERIES

A 19-character location strip is being used by all parties to the Pacific Salmon Treaty to geographically identify the locations of salmon stocks, hatcheries, release sites, recovery sites and sampling sites, coastwide.

In Washington State, the following outline describes the conventions used in coding each part of the location strip. Where possible, existing coding schemes used by Salmon Culture, Harvest Management, and existing data storage formats have been incorporated into the PST location strip.

LEVEL 0 (col. 1) State: 3 = Locations defined by Washington State entities.

LEVEL 1 (col. 2) Water Type: M = Marine-based location.
F = Freshwater-based location.

LEVEL 3 (cols. 4-5) Region: 1-24 see following table.

Regions in Sector 1

----- Puget Sound Commercial, & all P.S. Rivers: Comm, Sprt, Hat
1 = Nooksak/Samish Terminal (7B,7C,7D,7E,Nooksack & Samish Rivers)
2 = Skagit Terminal (8, Skagit R)
3 = Stillaguamish/Snohomish Terminal (8A,8D,Stilly & Snohomish Riv)
4 = Hood Canal Terminal (9A,12,12A-12D)
5 = South Puget Sound Terminal (10,10A-10G,11,11A,13,13A-13K,tribs)
6 = Domestic Mixed Stock (9,6B)
7 = International Mixed Stock (4A,4B,5,6,6A,6C,7,7A)
8 = Strait of Juan de Fuca Terminal (6D & all Straits rivers)

----- Puget Sound Sport -----

11 = International Mixed Stock (5,6,7)
12 = Skagit, Stilly, Snohomish Terminal (8)
13 = Domestic Mixed Stock (9)
14 = South Puget Sound Terminal (10,11,13)
15 = Hood Canal Terminal (12)

Regions in Sector 2

----- Coastal Streams & Estuaries Commercial, Sport & Hatchery -----
 17 = North Coastal Streams
 18 = Grays Harbor Estuary (2A-2F) & all tributaries
 19 = Willapa Harbor Estuary (2G-2M) & all tributaries

Regions in Sector 4

----- Columbia River Commercial, Sport and Hatchery -----
 20 = Columbia River (1A-1H) & all tributaries & hatcheries

Regions in Sector 3

----- Ocean Commercial and Sport -----
 21 = (1)
 22 = (2) (excluding estuaries)
 23 = (3)
 24 = (4) (marine sport punch card area 4)
 25 = (5) (area 5 troll landings only)
 26 = (6) (area 6 troll landings only)

LEVEL 4 (cols. 6-9) Stat Area: Punch Card Area (PCA)

(PCA used at this level for all locations, even freshwater sites, i.e. PCA that each stream discharges into)

LEVEL 5 (cols. 10-16) Location: blank = no further resolution needed.

single letter = sub PCA

01-62 = WRIA/Stream code of:

hatchery water supply,
 stock stream of origin,
 release site,
 recovery site, or
 sampling site.

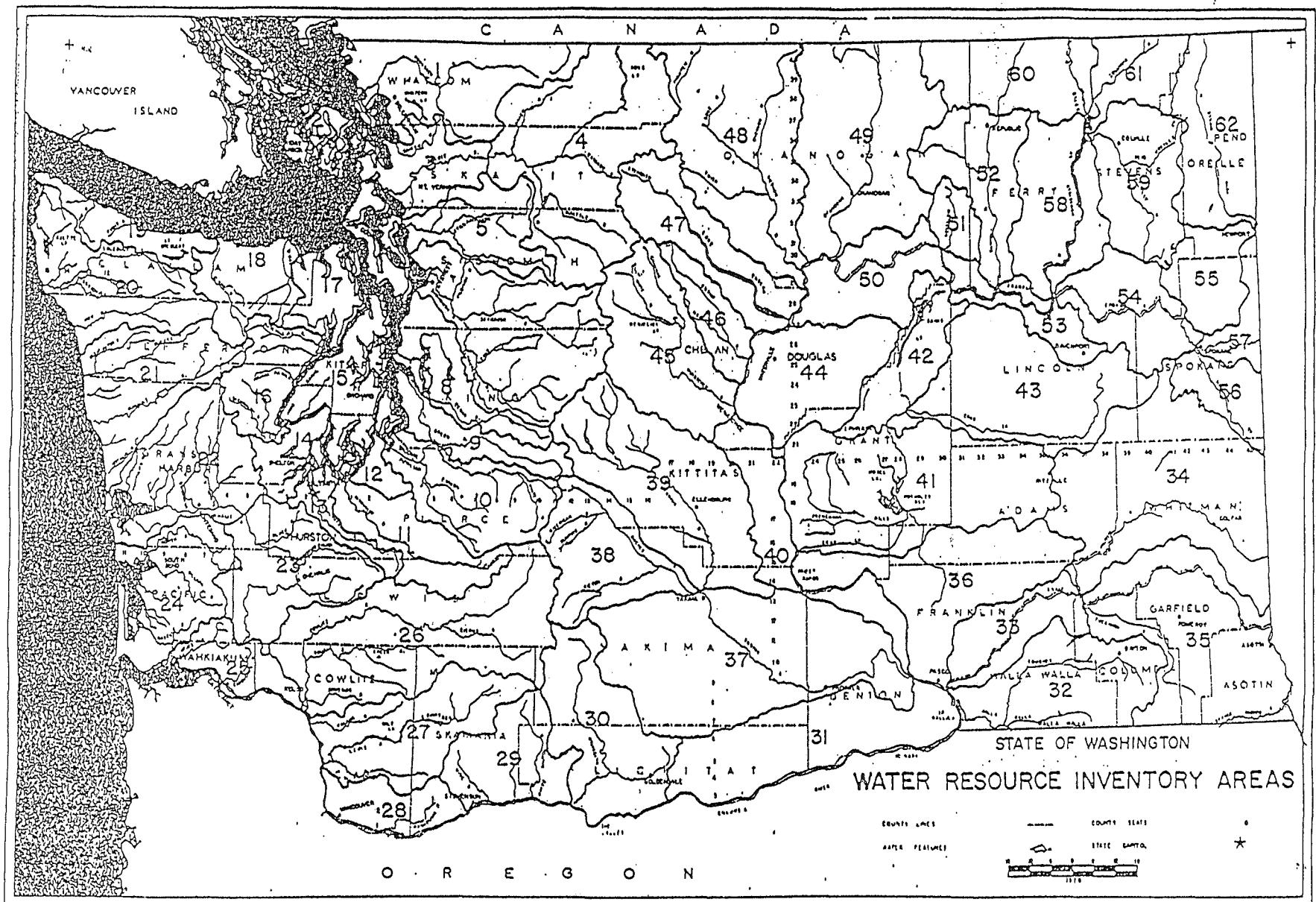
(a "z" in column 16 indicates a non-coded stream or streams that are "tributaries to" the coded stream)

86 = Ocean SUBAREA (e.g. 860074)
 87 = Puget Sound sport sampling
 871xxx = land-based site
 872xxx = water-based site
 (the xxx part of this scheme is subject to revision soon)
 88 = Marine net pen

LEVEL 6 (cols. 17-19) Sub-loca: R = river or stream
R02 = second stream (heading upstream) having the same WRIA/Stream code (e.g. the Quillayute R. & the Soleduck R. share 200096, the Soleduck R. is the second stream so its sub-location is R02)
H = Hatchery
H02 = 2nd hatchery from mouth of stream
S = Stock

**State of Washington
Water Resource Inventory Areas**

WRIA	Name / Major Rivers	Region
1	Nooksack	Puget Sound
2	San Juan	" "
3	Lower Skagit - Samish	" "
4	Upper Skagit	" "
5	Stillaguamish	" "
6	Island	" "
7	Snohomish	" "
8	Cedar - Sammamish	" "
9	Duwamish - Green	" "
10	Puyallup - White	" "
11	Nisqually	" "
12	Chambers - Clover	" "
13	Deschutes	" "
14	Kennedy - Goldsborough	" "
15	Kitsap	" "
16	Skokomish - Dosewallips	" "
17	Quilcene - Snow	" "
18	Elwha - Dungeness	" "
19	Lyre - Hoko	Coastal
20	Soleduck - Hoh	"
21	Queets - Quinault	"
22	Lower Chehalis	"
23	Upper Chehalis	"
24	Willapa	"
25	Grays - Elokomin	Columbia River
26	Cowlitz	" "
27	Lewis	" "
28	Salmon - Washougal	" "
29	Wind - White Salmon	" "
30	Klickitat	" "
31	Rock - Glade	" "
32	Walla Walla	" "
33	Lower Snake	" "
34	Palouse	" "
35	Middle Snake	" "
36	Esquatzel Coulee	" "
37	Lower Yakima	" "
38	Naches	" "
39	Upper Yakima	" "
40	Alkali - Squilchuck	" "
41	Lower Crab	" "
42	Grand Coulee	" "
43	Upper Crab - Wilson	" "
44	Moses Coulee	" "
45	Wenatchee	" "
46	Entiat	" "
47	Chelan	" "
48	Methow	" "
49	Okanogan	" "
50	Foster	" "
51	Nespelem	" "
52	Sanpoil	" "
53	Lower Lake Roosevelt	" "
54	Lower Spokane	" "
55	Little Spokane	" "
56	Hangman	" "
57	Middle Spokane	" "
58	Middle Lake Roosevelt	" "
59	Colville	" "
60	Kettle	" "
61	Upper Lake Roosevelt	" "
62	Pend Oreille	" "





WASHINGTON
Department of
FISHERIES

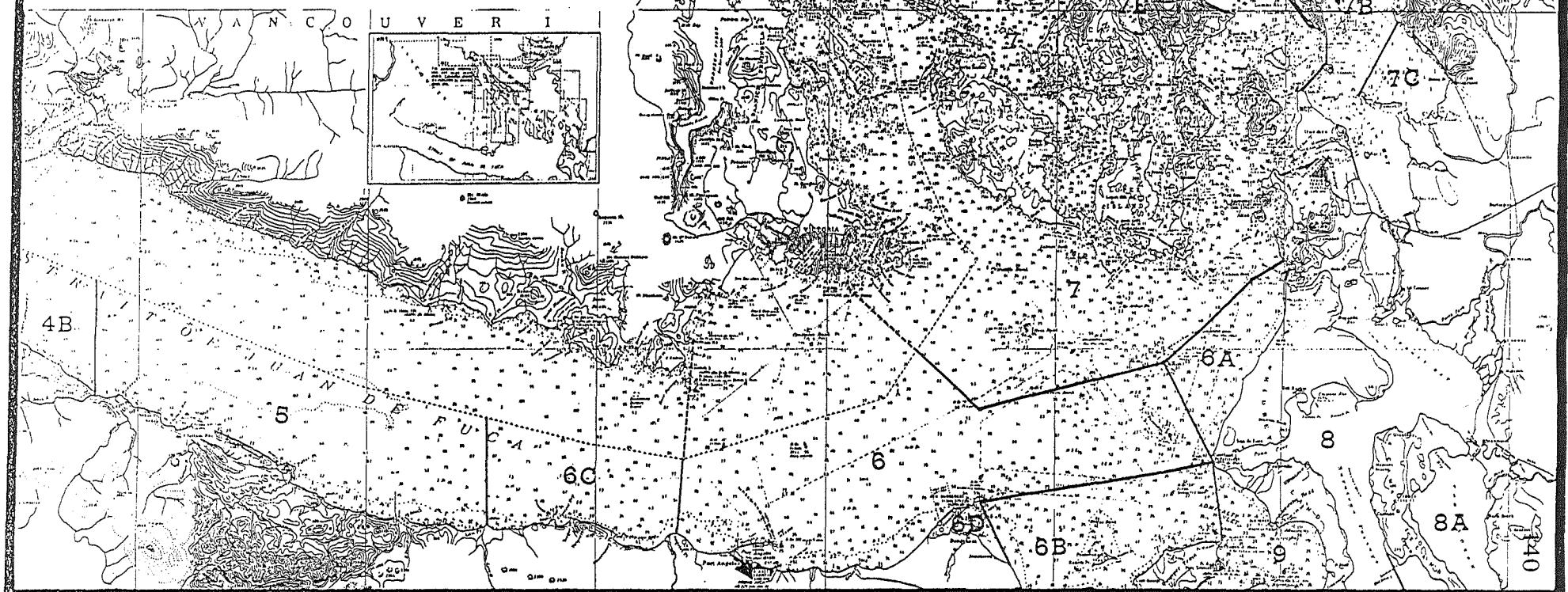
**NORTHERN
PUGET SOUND COMMERCIAL SALMON
MANAGEMENT AND CATCH REPORTING AREAS**

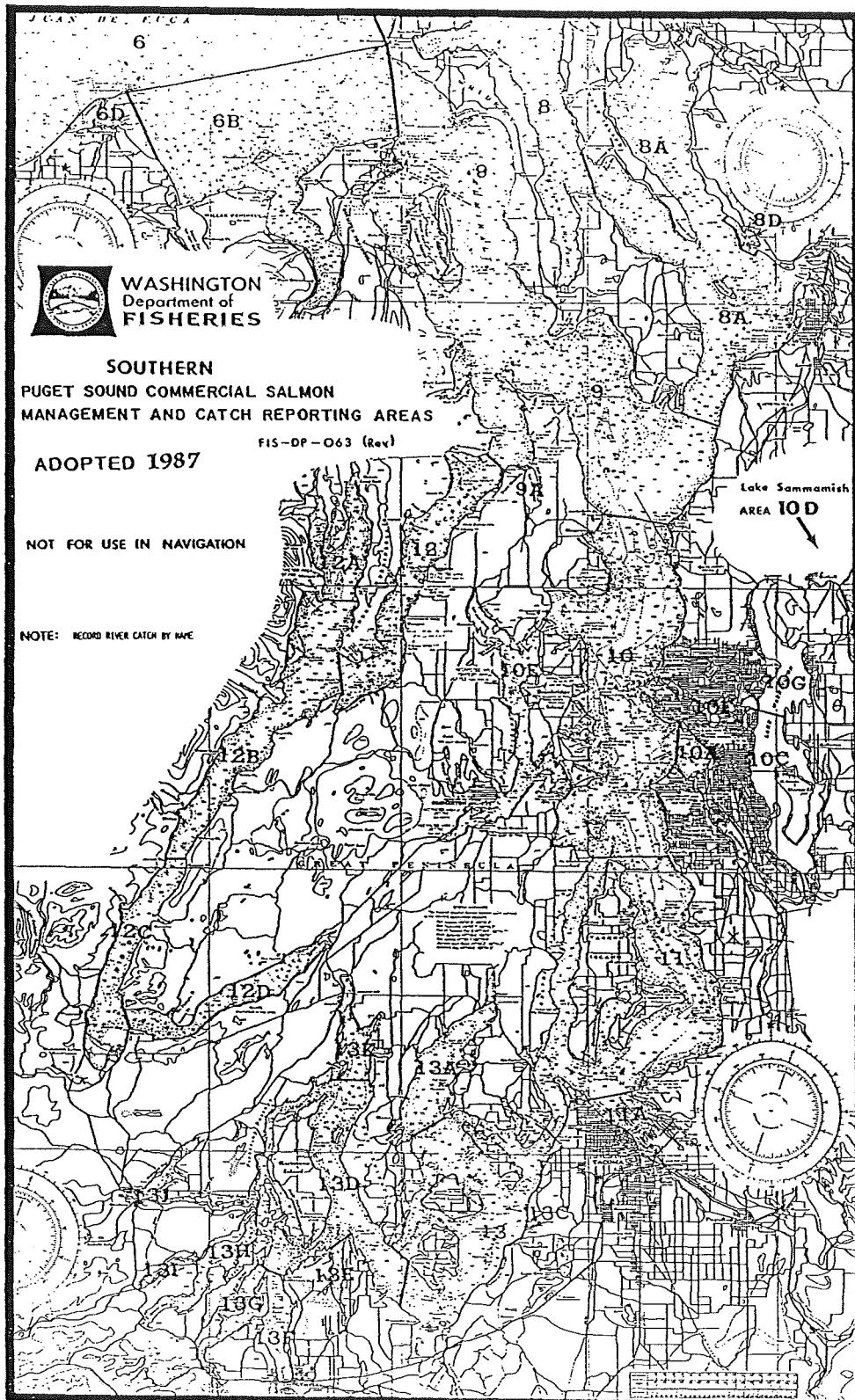
FIS-OP-060 (Rev)

ADOPTED 1987

NOT FOR USE IN NAVIGATION

NOTE: RECORD RIVER CATCH BY NAME

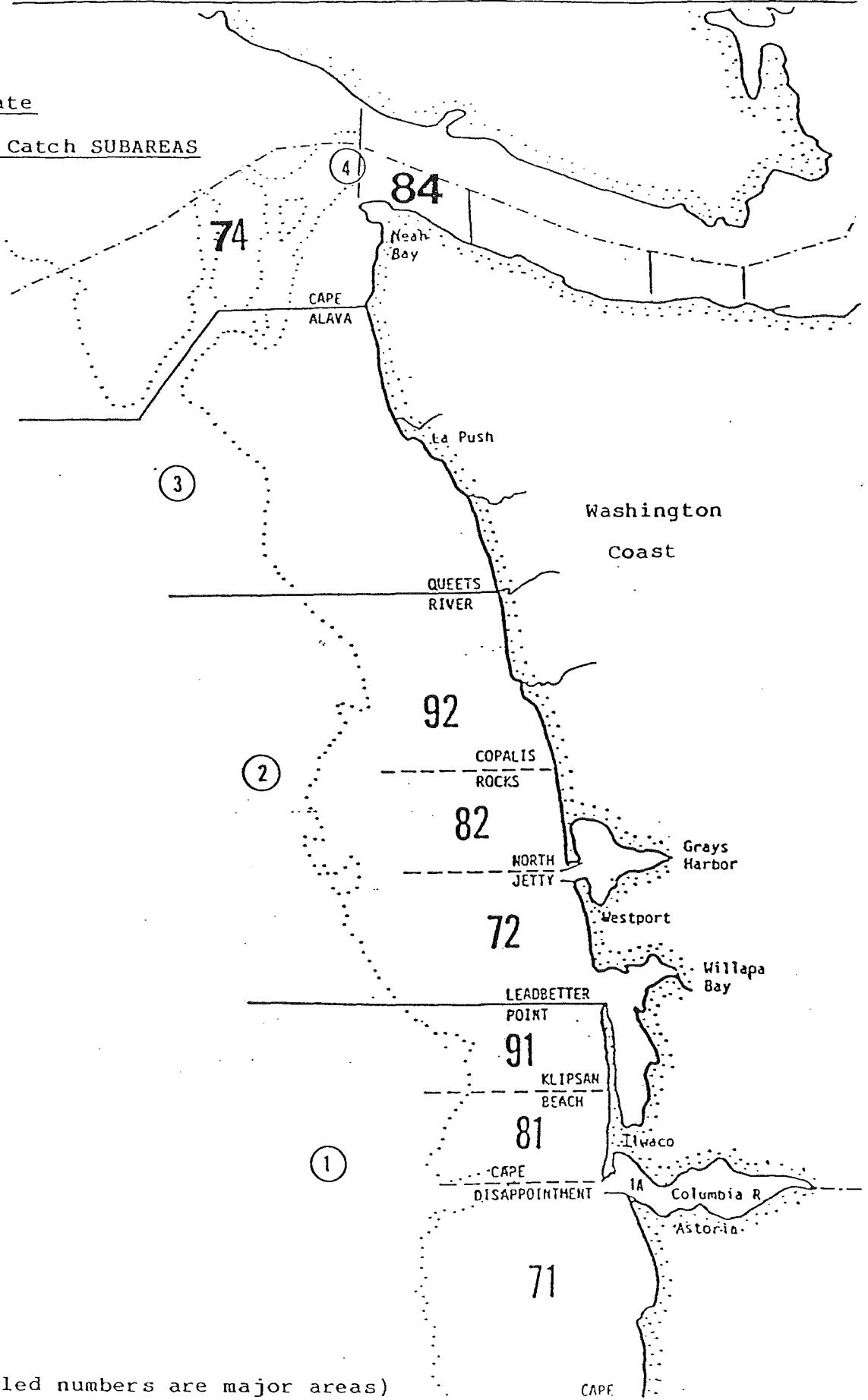




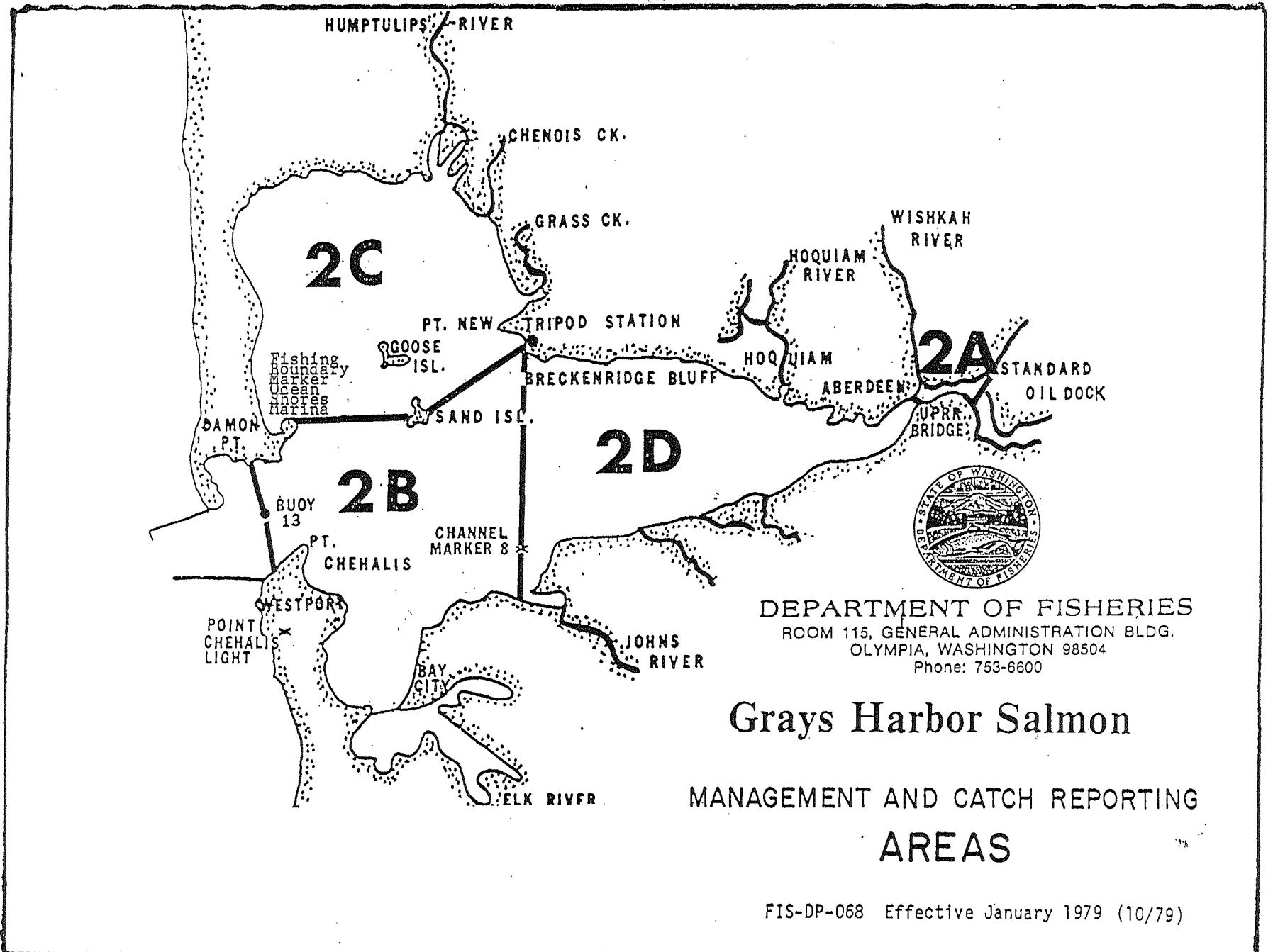
142

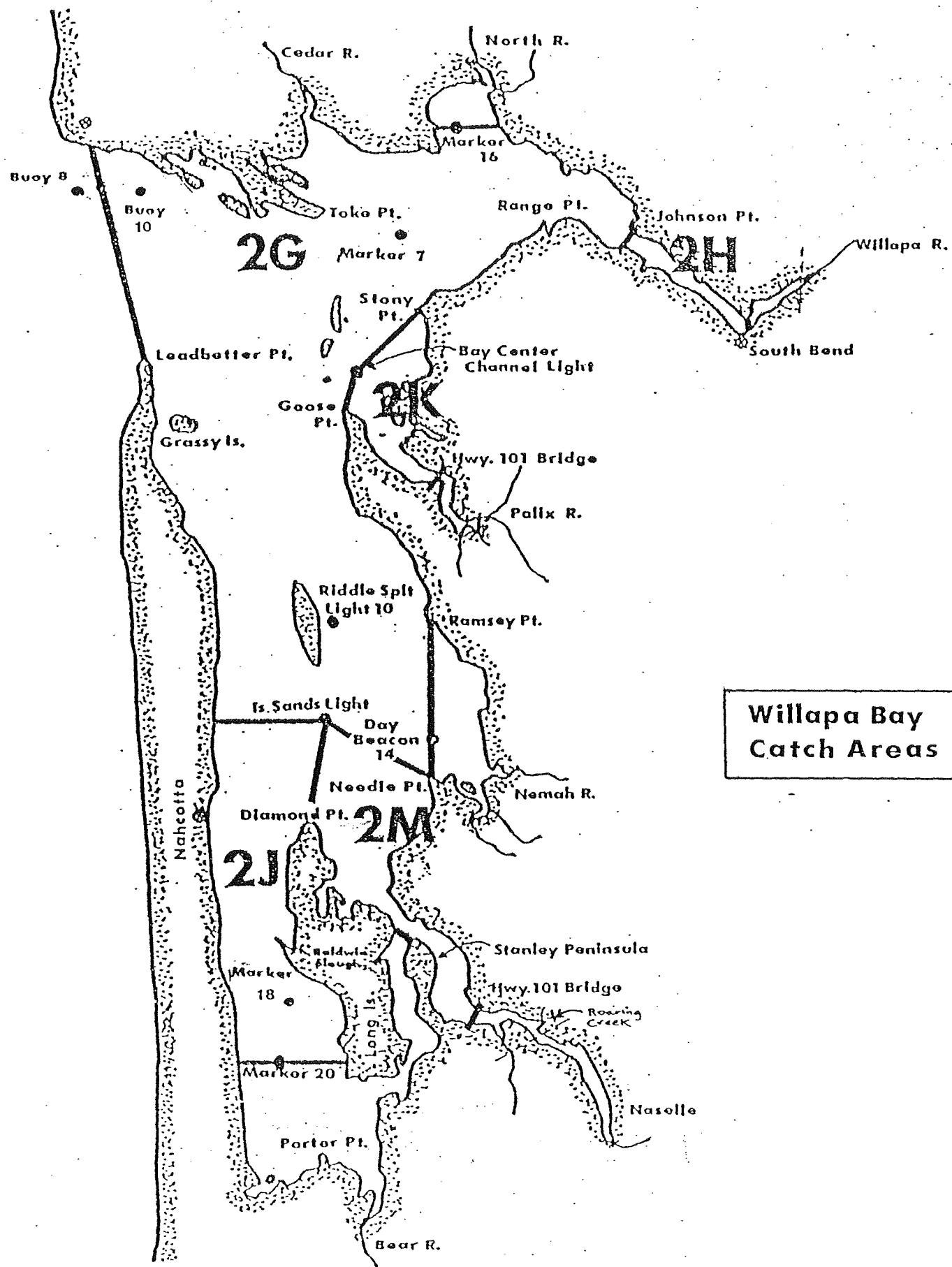
Washington State

Coastal Sport Catch SUBAREAS

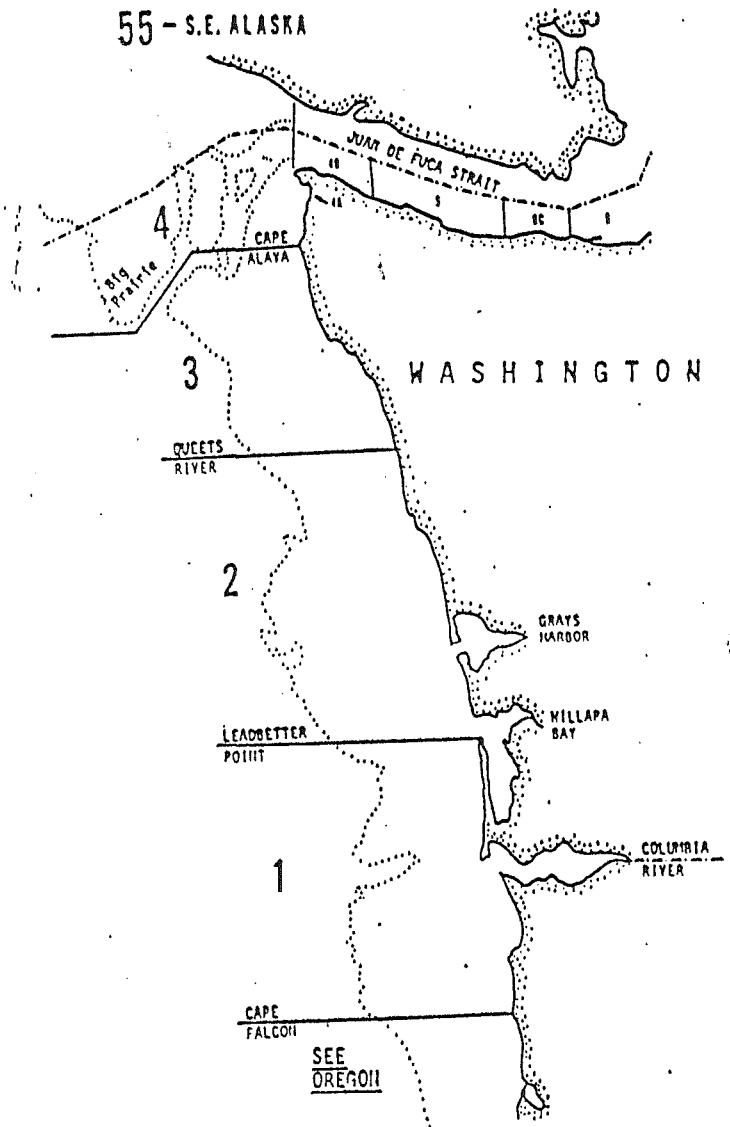


(small encircled numbers are major areas)





55 - S.E. ALASKA



SEE
WASHINGTON

CAPE
FALCON

61A

CASCADE
HEAD

61 B

HECETA
HEAD

610

61 □

POINT

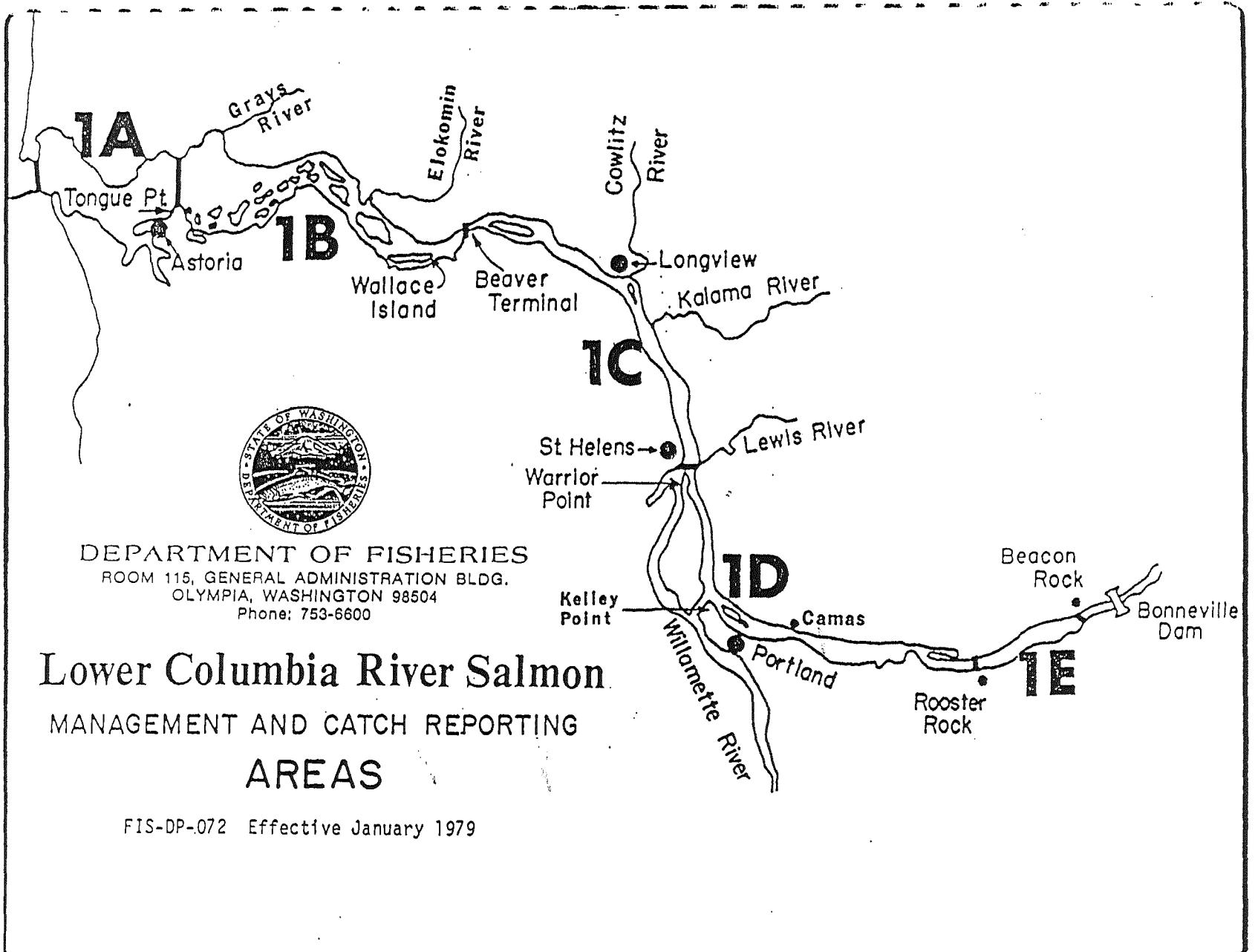
62 - N. CALIFORNIA

COLUMBIA
RIVER

OREGON

CALIFORNIA

COMMERCIAL TROLL SALMON STATISTICAL CATCH AREAS



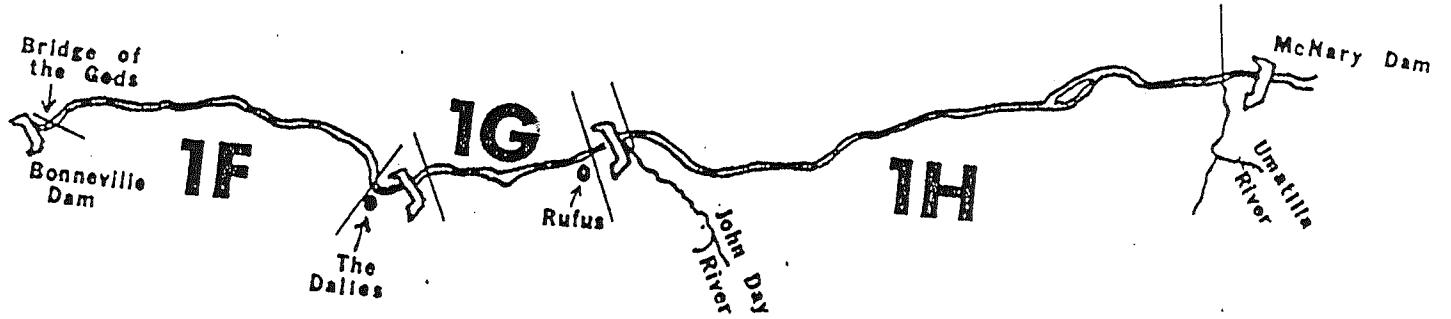


DEPARTMENT OF FISHERIES

ROOM 115, GENERAL ADMINISTRATION BLDG.
OLYMPIA, WASHINGTON 98504
Phone: 753-6600

Upper Columbia River Salmon MANAGEMENT AND CATCH REPORTING AREAS

FIS-DP-071 Effective January 1979



APPENDIX 4.5

Coding for Fisheries
for
Pacific Salmon Commission CWT Data Exchange

Version 1.2
5/12/88

I. Overview

Code	Gear
10-19	Troll
20-29	Net and Seine
40-49	Sport
50-59	Escapement
60-69	Test Fisheries
70-79	Juvenile Sampling
80-89	High Seas
90-99	Miscellaneous

II. Detailed Coding

<u>Code</u>	<u>Fishery</u>	<u>Agency Fisheries and Codes</u>		
A.	10 Series: Troll			
10	Ocean Troll (Non-treaty)	ADFG	- 11	Commercial Troll
		CDFG	- 00	Commercial Troll
		CDFO	- 30	Troll General
		ODFW	- 10	Ocean Troll
		WDF	- 41	Troll (Non-Treaty)
11	Ocean Troll - Day Boat	CDFO	- 32	Troll - Day Boat
		WDF	- 33	Troll - Day Boat
12	Ocean Troll - Trip Boat	WDF	- 34	Troll - Trip Boat
13	Ocean Troll - Freezer Boat	CDFO	- 31	Troll - Freezer Boat
14	Ocean Troll - Ice Boat	CDFO	- 33	Troll - Ice Boat
15	Treaty Troll	WDF	- 40	Treaty Troll
16	Terminal Troll	NMFS(AK)	- 73	Terminal Troll
19	Other	ADFG	- 01	Other Source Troll Gear

<u>Code Fishery</u>		<u>Agency Fisheries and Codes</u>		
B. 20 Series: Net and Seine				
20	Ocean Gillnet (Non-treaty)	ADFG CDFO	- 13 - 10	Commercial Gillnet Gillnet
21	Columbia River Gillnet	ODFW	- 13	Columbia River Gillnet
22	Coastal Gillnet	QDNR WDF	- 16 - 14	Coastal Net Non-treaty Gillnet (coast)
23	Mixed Net and Seine	WDF CDFO	- 11 - 13 - 14 - 16 - 17 - 19 - 20 - 29 - 51 - 52 - 15	Dip Bag Net Beach Seine Non-treaty Gillnet (inside) Set Net ty Gillnet Non-treaty Purse Seine Reef Net Treaty Purse Seine Treaty Trap Mixed Net Mixed Net
24	Freshwater Net	CDFO	- 45	Freshwater Net (mixed)
25	Commercial Seine	ADFG CDFO	- 12 - 20	Commercial Seine Seine
26	Terminal Seine	NMFS(AK)	- 77	Terminal Seine
27	Freshwater Seine	ODFW	- 36	River Seine (non-Columbia)
28	Other Net	ADFG	- 04	Other Source Glnet
29	Other Seine	ADFG	- 02	Other Source Seine

<u>Code</u>	<u>Fishery</u>	<u>Agency</u> <u>Fisheries and Codes</u>		
C.	40 Series: Sport			
40	Ocean Sport	ADFG	- 20	Sport
		CDFG	- 03	Sport
		CDFO	- 07	Sport
		ODFW	- 11	Ocean Sport
		WDF	- 95	Marine Sport
41	Sport (Charter)	CDFG	- 01	Sport - Charter
		WDF	- 31	Sport - Charter
42	Sport (Private)	CDFG	- 02	Sport - Skiff
		WDF	- 32	Sport - Kicker Boat
43	Sport (Jetty)	WDF	- 36	Jetty
44	Columbia River Sport	ODFW	- 12	Columbia River Sport
45	Estuary Sport	ODFW	- 32	Estuary Sport
		WDF	- 42	Puget Sound Sport
46	Freshwater Sport	CDFO	- 47	Freshwater Sport
		ODFW	- 14	Spring Sport
		ODFW	- 26	Deschutes River Sport
		ODFW	- 27	Freshwater
		ODFW	- 40	Mid Columbia R. Sport
		WDF	- 51	Freshwater Sport
		USFWS	- 51	Creel Survey
47	Freshwater Sport Snag	WDF	- 59	Freshwater Sport Snagging
48	Terminal Sport	NMFS(AK)	- 76	Terminal Sport
49	Other			

<u>Code</u>	<u>Fishery</u>	<u>Agency Fisheries and Codes</u>		
D.	50 Series Escapement			
50	Hatchery	ADFG	- 40	Rack Returns
		CDFO	- 40	Hatchery Rack
		NMFS(AK)	- 50	Hatchery Returns
		ODFW	- 21	ODFW Hatcheries
		ODFW	- 22	Other Oregon Hatcheries
		ODFW	- 23	Oregon Private Hatcheries
		USFWS	- 50	Hatchery Returns
52	Fish Trap (Freshwater)	WDF	- 50	Hatchery
		ADFG	- 04	Other Source Trap Gear
		CDFO	- 42	Trap
		NMFS(AK)	- 52	Fish Trap
		ODFW	- 24	Fish Trap
53	Gaff	WDF	- 52	Fish Trap
		CDFO	- 43	Gaff (Wild Fish)
54	Spawning Ground	WDF	- 53	Gaff
		ADFG	- 40	Escapement Survey
		CDFO	- 41	Spawning Ground
		NMFS(AK)	- 54	Spawning Ground
		ODFW	- 18	Spawning Ground Survey
55	Treaty Ceremonial	WDF	- 54	Spawning Ground
		ODFW	- 16	Ceremonial
56	Treaty Subsistence	ADFG	- 50	Subsistence
		ODFW	- 20	Subsistence
59	Other			

<u>Code</u>	<u>Fishery</u>	<u>Agency Fisheries and Codes</u>		
E. 60 Series: Test Fisheries				
60	Test Fishery Troll	ADFG	- 61	Test Fishy Troll
61	Test Fishery Net	ADFG ODFW	- 63 - 15	Test Fishery Gillnet Columbia River Test
62	Test Fishery Seine	ADFG	- 62	Test Fishery Seine
63	Test Fishery Trap	ADFG	- 64	Test Fishery Trap
64	Test Fishery Unknown Multiple Gear	ADFG	- 60	Test Fishery Unknown Multiple Gear
69	Other			
F. 70 Series: Juvenile Sampling				
70	Juvenile Sampling - Troll (Marine)	NMFS(AK)	- 05	Juvenile Sampling - Troll
71	Juvenile Sampling - Gillnet (Marine)	NMFS(AK)	- 04	Juvenile Sampling - Gillnet
72	Juvenile Sampling - Seine (Marine)	NMFS(AK) ODFW NMFS(CR)	- 12 - 19 - 0	Juvenile Sampling - Seine OSU Experimental Ocean Purse Seine Outmigrant Sampling - Ocean
73	Juvenile Sampling - Seine (Freshwater)	NMFS(CR) NMFS(CR) ODFW	- C - S - 28	Outmigrant Sampling - Columbia River Outmigrant Sampling - Snake River Juvenile Sampling - Freshwater
79	Other			

<u>Code</u>	<u>Fishery</u>	<u>Agency</u> <u>Fisheries</u> <u>and</u> <u>Codes</u>		
G.	80 Series: High Seas			
80	Groundfish Observer (CA/OR/WA)	NMFS(AK)	- 80	Groundfish Observer (CA/OR/WA)
81	Groundfish Observer (Gulf of Alaska)	NMFS(AK)	- 81	Groundfish Observer (Gulf of Alaska)
82	Groundfish Observer (Bering Sea/Aleutians)	NMFS(AK)	- 82	Groundfish Observer (Bering Sea/Aleutians)
83	Foreign Research Vessels	NMFS(AK)	- 90	Japanese Research Vessels
84	Foreign Mothership Vessels	NMFS(AK)	- 91	Japanese Mothership Vessels
85	Ocean Trawl By-Catch	ODFW ODFW	- 30 - 33	Ocean Trawl By-Catch Pacific High Seas
H.	90 Series: Miscellaneous			
90	Multiple Gear	ADFG	- 00	Other Sources Unknown/Multiple Gear
91	PNP Cost Recovery	ADFG	- 30	PNP Cost Recovery
92	Columbia River Shad	ODFW	- 17	Columbia River Shad
93	Set-Line (Sturgeon)	ODFW	- 31	Columbia River Set Line (Sturgeon)
94	Fish Trap (Marine)	ADFG	- 14	Commercial Trap (Marine)
99	Other			

APPENDIX 6.1

Documents to be included for final report in this place are:

1. Memo to D. Bevan from F. de Libero; January 18, 1988; "Sixth Term of Reference"
2. "Preferred System for PSC Data Sharing"; US Section of Working Group on Mark Recovery Databases; January 18, 1988
3. Appendix I to Preferred System for PSC Data Sharing, "An Analysis of the Regional Mark Processing Center's Proposed Role as the Interim CWT Information System for the Pacific Salmon Commission"
4. Appendix II to Preferred System for PSC Data Sharing, "Features For a US Section PSC CWT Data Base"
5. Letter to D. Bevan from F. de Libero, February 9, 1988; "Per your instruction, additional information is provided below on the background and rationale of the U.S. Section Working Group on Mark Recovery Databases' January 18 recommendations for a preferred system for PSC data sharing..."

UNITED STATES SECTION
of the
PACIFIC SALMON COMMISSION

January 18, 1988

MEMORANDUM

TO: D. Bevan
FROM: F. de Libero *Frank*
SUBJECT: SIXTH TERM OF REFERENCE

Attached are the recommendations from the U.S. Section of the W/G on CWT Data Bases for a preferred system for PSC data sharing. The original package was tabled by Alaska during our U.S. Section this morning and, after some minor changes to Appendix II, was unanimously approved by the group.

These are being submitted to you in anticipation that they complete our sixth term of reference.

cc: C. Corrarino
B. Johnson
K. Johnson
M. Messenger
D. O'Connor

Preferred System for PSC Data Sharing

Purpose

In a Memorandum of Understanding to the Pacific Salmon Treaty, all participants agreed to:

...develop a coast-wide stock assessment and management data system, including, catch, effort, escapement, and coded-wire tag data that will yield reliable management information in a timely manner...

In furtherance of this, the PSC Data Sharing Committee, at its meeting of February 18, 1986, called for creation of a bilateral Working Group on Mark/Recovery Databases. One of its charges was:

Recommend a preferred [coded-wire tag data] system to be adopted coastwide; and project time required before the system could be fully operational.

At the November 19, 1987 plenary session of the PSC, the Commissioners restricted the scope of the charge by agreeing no single US/Canada database would be established under auspices of the PSC. Instead, Canada and the U.S. will maintain separate databases. Appropriate data will be regularly exchanged between the Canada database and a single U.S. database.

The U.S. Commissioners subsequently considered the single U.S. database. Their joint decision was announced in a letter from U.S. Commission Chair Wapato on December 17, 1987:

... the U.S. Commissioners have considered the database siting issue and have concluded that the Pacific Marine Fisheries Commission's (PMFC) Mark Processing Center is best suited to meet PSC information needs for CWT data.

This report is submitted by the below named U.S. representatives to the Working Group on Mark/Recovery Databases in fulfillment of the above charge.

Preferred System for PSC Data Sharing

Implementation Recommendation

A PSC coded-wire tag management data system has been analyzed and discussed by the Working Group for approximately two years. The following implementation scenario, previously presented to the Data Sharing Committee under the title "Interim System", is recommended.

The U.S. Regional Mark Processing Center (RMPC) enhance its role of coastwide CWT Release coordination by:

- Adopting PSC Data Standard Release format for the Mark Center CWT Release Database.
- Incorporate into the RMPC Release database non-CWT Release information.
- Collecting Release data from all RMPC-serviced agencies and Canada in PSC format.
- Auditing and controlling data according to the PSC format.
- Providing Release data by 9-track 1600 BPI tape, 1.2MB and 360KB PC floppy disk, and hard copy in the PSC format.

The RMPC serve as Recovery and Catch/Sample clearinghouse by performing the following tasks:

- Accept PSC agency data files on 9-track 1600 BPI tape.
- Validate that submitted tapes adhere to PSC mandatory format constraints, rejecting any tapes not in 100% compliance. This would make compliance to standards the responsibility of the submitting agency.
- Maintain current records of data update level by agency, year, and file type.
- Duplicate master tapes and provide copies to PSC agencies as updated version of data are accepted.

Preferred System for PSC Data Sharing

This would discourage inter-agency exchange of unvalidated data.

PSC agencies develop data processing functions using their existing facilities to manipulate PSC data to meet their individual needs. They would also be able to extract and distribute data subsets to users within their geographical jurisdictions.

Feasibility Analysis

The Working Group presented the Recommended Implementation, in draft form titled "Interim System", to the Regional Mark Processing Center for trial consideration. The RMPC returned a feasibility analysis to the Working Group. Their report, entitled An Analysis of the Regional Mark Processing Center's Proposed Role as the Interim CWT Information System for the Pacific Salmon Commission, is attached as Appendix I.

There was some confusion as to whether the study addressed a U.S. only system or a joint US/Canada system. However, the analysis is equally applicable to either case. As explained in the Purpose section of this document, we are dealing with a U.S. only system.

The Mark Center, of course, serves a wider constituency than only the U.S. PSC participants. In order to satisfactorily meet the needs of all their users, their report describes a system that has greater functionality than what is called for in the Implementation Recommendation. Their proposed system is judged as satisfying the Recommendation.

Future Needs

It is recognized that management information systems are not static. Forces are at constant work, demanding periodic revision to such systems. Examples of such forces are the rapid advance of computing and telecommunications technology, changes in the nature of information managed, and continuing new needs of end users.

Preferred System for PSC Data Sharing

In light of this, the Working Group has assembled an inventory of ultimately desired features in a PSC management data system. It is attached as Appendix II. These were drafted under the assumption that anything was possible ("greenlighting"). They were then condensed into a set of mutually consistent features that could be implemented with current technology under existing organizational structures.

These features describe a goal having improved accessibility, more timely distribution of information, and capability to manage types of information well beyond coded-wire tag data. As the information systems of participating PSC agencies, and as the Recommended Implementation, continue to evolve, the planners should be guided to this goal.

8/3/87

**An Analysis of the Regional Mark Processing Center's
Proposed Role as the Interim CWT Information System
for the Pacific Salmon Commission**

Executive Summary

At the recommendation of the Working Group on Mark Recovery Databases, the Pacific Salmon Commission's (PSC) Committee on Data Sharing recently requested the Pacific Marine Fisheries Commission (PMFC) to serve as an "Interim Information System" for PSC's coded wire tag data needs until such time as a long term system can be implemented.

PMFC has carefully examined this proposal and is willing to assist fully. However, the request represents a very significant expansion of the role and work load that the Regional Mark Processing Center (RMPC) is now performing for fisheries agencies on the West Coast. Enhancements will therefore be required in hardware, software, and staff assistance. The estimated costs of these required enhancements are summarized below:

Programming	\$15,000
Hardware	
Computer (lease option)	25,000
Modem - 19.2K baud (2)	2,700
Computer Assistant position	<u>30,000</u>
Totals:	\$72,700 - 1st year \$55,000 - successive years thereafter

The RMPC budget does not have any surplus funds because of successive budget cuts over the past several years. Therefore, new funds must be found in order for the RMPC to provide the requested services as an interim system for PSC. As all major users benefit, they will be expected to share in providing the necessary financial help in order to meet the new costs. PMFC is also prepared to assist in the funding.

8/3/87

**An Analysis of the Regional Mark Processing Center's
Proposed Role as the Interim CWT Information System
for the Pacific Salmon Commission**

I. Introduction

At the recommendation of the Working Group on Mark Recovery Databases, the Pacific Salmon Commission's (PSC) Committee on Data Sharing recently requested the Pacific Marine Fisheries Commission (PMFC) to serve as an "Interim Information System" for PSC's coded wire tag data needs until such time as a long term system can be implemented. Specifications of this Interim System proposal for PMFC's Regional Mark Processing Center are as follows:

INTERIM SYSTEM

- A. Request PMFC enhance its role of coastwide CWT Release coordination by:**
 1. Adopting PSC Data Standard Release format for the Mark Center CWT Release Database.
 2. Collecting Release Data from all PMFC agencies and B.C. in the PSC format.
 3. Auditing and controlling data according to the PSC format.
 4. Providing release data by 9-track 1600 bpi tape, 1.2m and 360k PC floppy disk and hard copy in the PSC format.
- B. Request PMFC serve as Recovery and Catch/Sample clearinghouse by performing the following tasks:**
 1. Accept PSC agency data files on 9-track 1600 bpi tape.
 2. Validate that tapes adhere to PSC format, rejecting in total any tapes not in 100% compliance.
 3. Maintain current records of update level by agency, year, and file type.
 4. Duplicate master tapes and provide copies to PSC agencies as updated versions of data are accepted. This would discourage interagency exchange of standard data.
- C. PSC agencies will develop data processing functions using existing equipment to manipulate PSC data to meet their individual needs. They should also be able to extract and distribute data subsets to users within their own geographical jurisdictions.**

PMFC has carefully examined this proposal and is willing to assist fully. However, the request represents a very significant expansion of the role and work load that the Regional Mark Processing Center (RMPC) is now performing for fisheries agencies on the West Coast. Therefore, each task is reviewed below to highlight additional demands upon the Mark Center in terms of manpower, data processing, programming and hardware.

Before doing so, however, it is first necessary to review the origin of RMPC and its present role as it has a direct bearing on how some of the tasks will be carried out.

II. Overview of the Mark Processing Center

A. Mission

The RMPC provides essential services to State, Federal, Indian and private fisheries agencies involved in marking anadromous salmonids on the West Coast. These services include regional coordination of tagging and fin marking programs, maintenance of a regional database for CWT releases and recoveries, and distribution of printed and/or machine readable data reports and files.

B. Historical Background

Prior to the 1970's, regional pooling of mark recovery data depended largely on individual interagency exchanges. This problem was rectified in 1970 when Oregon Department of Fish and Wildlife (ODFW) established the Regional Mark Processing Center at its Clackamas lab. ODFW operated the RMPC during 1970-1976 and was instrumental in commencing the publication of regional CWT release and recovery reports.

The advent of coded wire tags in the early 1970's and subsequent dramatic upsurge in tagging eventually led to an intolerable burden on the data processing capabilities of the RMPC at Clackamas. Therefore, in June, 1976, PMFC's regional Salmon and Steelhead Committee recommended that the RMPC operations be upgraded by establishing a Regional Mark Coordinator position and a Computer Assistant position. In addition, it was recommended that the RMPC be transferred to PMFC because of its non-political status.

These recommendations were carried out in July, 1977 following unanimous approval of PMFC's Executive Committee. The Computer Assistant position, however, was not filled until 1979 because of funding problems.

C. Over-Sight Committee

The RMPC's operations are overseen by the 16 member Committee on Anadromous Fin Marking and Tagging (i.e. the "Mark Committee"). Committee members represent not only PMFC's five member states (Alaska, Washington, Oregon, Idaho, California) but all other

federal (USFWS, NMFS), Indian (NWIFC, CRITFC, Metlakatla) and private fisheries agencies on the West Coast, including those in British Columbia. All have an equal voice when decisions are required.

D. Data Needs of PSC and Non-PSC Agencies

Pacific Salmon Commission participants (Alaska, British Columbia, Washington, and Oregon) represent the major subset of the CWT user community now served by the RMPC. It is equally true that an expanded, well designed CWT information system is needed to meet management and research needs within the scope of the Pacific Salmon Treaty requirements. Therefore, it is logical that the focus of upgrading the Mark Center's existing CWT database has been almost entirely on meeting PSC participant needs.

It is equally important, however, to recognize that non-PSC participant needs in the Columbia Basin, Oregon, and California are much broader than those of PSC participants. Therefore, given the constituency of the RMPC, any information system upgrade to meet PSC needs must be done in a fashion that continues to meet the needs of all member agencies. For this reason, the RMPC proposes to adopt the new PSC data formats and standards in full and consider the PSC participants needs as a subset (albeit dominant) of the entire regional user community. Hence, services now provided by the RMPC will be continued and upgraded as time and funding permit. This includes on-line access to summary files of CWT recovery and catch/sample data of both PSC and non-PSC participants.

III. New Database Requirements

A number of modifications are required to upgrade the RMPC's information system to the new specifications. These modifications are reviewed below.

A. Upgrade CWT Release Database

Task 1: Adopt the PSC database standard release format for the Mark Center's CWT release database.

As noted earlier, the RMPC will adopt in full the PSC formats for the release database as well as those for the recovery and catch/sample databases.

The CWT release database will likely be the easiest of the three to reformat because of the nature of the data file. New data entry and validation programs also will be needed.

Task 2: Collect release data from all PMFC agencies and British Columbia in the PSC format.

This is a major task and will require a great deal of work to accomplish because of the new data requirements expected of all releasing agencies. Some of the more important changes and their impact are:

- a) All untagged releases are now to be reported along with the tagged releases.

This is probably the most difficult of the new tasks as untagged releases represent a far larger data set than that for tagged releases. In addition, some agencies do not have these data readily accessible. Historical data will be a major problem as well for many agencies.

An indication of the effort involved can be obtained from NMFS's (Portland) experience in maintaining a database for total hatchery releases during the early 1980's. Approximately one half man-year was required each year to collect and process the data.

- b) Stock, hatchery, and release site names will be converted to a 19 character numeric coding (hierarchial structure) which will identify the state or province, water type (marine or freshwater), sector, region, area, location, and sub-location.

This task should be relatively easy for ADFG, CDFO, WDF, and ODFG to accomplish now since the new coding has already been developed. However, considerable time and effort will be required to assist the other tagging agencies (approximately 25) to develop the new coding.

A second problem is that of reporting. ADFG, CDOF, WDF, and ODFG report new release data via magnetic tape. Nearly all other releasing agencies, however, use report forms because of the smaller number of tag codes involved and in some cases, because of the lack of computer equipment and/or skills. For these agencies, special procedures will need to be worked out to report the 19 character codes.

- c) Expand release data from month/year to day/month/year.

(See subtask d below for comparable explanation of requirements.)

- d) Separate the datum "Number Untagged" into its actual components of "Number of Adipose Only" and "Number Untagged and Unmarked"; also delete the datum "% Tag Loss" as it can be calculated from the new fields above.

These latter two tasks will need to be done for all pre-1987 CWT releases (12,873 codes). Of these, approximately one third will have to be manually edited since the releasing agencies do not submit data revisions by magnetic tape.

Task 3: Auditing and controlling data according to the PSC format.

Extensive auditing and validation checks are already in place. However, it is certain that others will be required following a comparison of procedures used by ADFG, CDFO, WDF, and ODFW. These changes will be incorporated into the error check programs when they are re-written.

Task 4: Provide release data by 9-track 1600 bpi tape, 1.2m and 360k PC floppy disk and hard copy in PSC format.

The RMPC currently has the necessary hardware to provide agencies with copies of the CWT release database on 9-track 1600 bpi tape but not on 1.2m or 360k floppy disk. This latter problem will be corrected next month with the purchase of a Compaq Deskpro 360 PC (see discussion on hardware).

B. Recovery and Catch/Sample Tasks

Task 1: Accept PSC agency data files on 9-track 1600 bpi tape.

The RMPC has this capability but will need to develop new programs for loading, error-checking, and processing the recovery data files.

Task 2: Validate that tapes adhere to PSC format, rejecting in total any tapes not in 100% compliance.

The RMPC is in agreement with this policy as it ensures that each agency is responsible for data integrity. In addition, the burden of clean data is placed on the submitting agency rather than on the RMPC.

Task 3: Maintain current records of update level by agency, year, and file type.

The RMPC maintains this type of information but it is not computerized. Therefore, additional programming is required to automate update logs.

Task 4: Duplicate master tapes and provide copies to PSC agencies as updated versions of data are accepted.

The RMPC currently performs this service but has need of reducing the turn-around time between data submission and distribution. This will be corrected by additional manpower and a more powerful computer.

C. Other Tasks not Noted under the "Interim" Proposal

Task 1: Maintain dual systems.

It will be necessary to continue to maintain all new release, recovery, and catch/sample data in the current RMPC format until such time as the new format has been thoroughly tested and the data conversion of all files has been completed. This task, needless to say, will require considerable effort and care to maintain both systems and also ensure data integrity.

Task 2: Continue to provide on-line services to all CWT users.

The RMPC ceased publication of annual CWT recovery reports in 1986 and now provides users with on-line data retrieval capabilities for tag codes of interest. This service will be continued and upgraded to meet the needs of non-PSC participants. PSC participants may also elect to use these services while a long-term information system is being implemented.

It has also been recommended that the Mark Center develop the necessary software so that users have the option to access the RMPC's on-line recovery files via the excellent software package now being developed by Richard Comstock (USFWS) and Frank deLibero (WDF) for use on the CYBER computer at the University of Washington. This will be carried out if it is feasible.

IV. Hardware

A. Computer Needs

The RMPC currently uses a Mentor 4152 mini-computer which is produced by ADDS (Applied Digital Data Systems, Inc.). It has 1 MB of main memory, 150 MB of disk, 16 ports, a 1600 bpi 9-track tape drive and a 6 MHz processing speed.

It's major strength is the PICK Operating System which is an extremely flexible and easy to use multi-user, relational database management system (DBMS). It's main weakness is that it does not have strong facilities for networking and communications. In addition, the current CWT recovery database is now in excess of 1 million records and has greatly outgrown the computer's capabilities for rapid data processing.

These serious limitations necessitate the purchase or lease of a higher powered computer for the RMPC operations. Considerably more memory and processing speed is required in order to adequately handle the expanded database mandated by PSC. The lease option is favored because it allows the use of a much more powerful machine than otherwise would be possible. In addition, a lease can be

terminated if necessary because of changes in data processing responsibilities.

The type of computer has not been selected yet but likely will support the PICK Operating System because of its relational database benefits and the existing software. However, a close look will be given to other systems. One particularly attractive option is a larger multi processor PICK implementation running on top of a UNIX system, thus combining the strengths of PICK's DBMS and UNIX's well known communication strengths.

The cost of a large enough computer to handle the CWT database (i.e. 20 MHz processor, 2 MB RAM, 500 MB disk, 3-5 MIPS) appears to be in the \$80,000-\$120,000 range. Lease prices (5 years) fall in the range of \$1,600-\$2,500 per month or \$19,200-\$30,000 per year.

B. Micro Computer Needs

The Mark Center has needed a micro computer for some time in order to download subsets of release and recovery data onto floppy disks for CWT users who wish to run special analyses on their own PC systems. Likewise, users could submit CWT data to the RMPC on floppy disks if a 1600 bpi 9-track tape drive was unavailable to them.

Given the broad benefits, PMFC will purchase a micro computer for the RMPC in August. A Compaq DeskPro 80360 (Model 130) will most likely be selected. In addition, PMFC has already purchased a software package, "PK Harmony", which allows the transfer of PICK data files to MS-DOS and vice versa. Some of the popular PC formats accommodated include Lotus 1-2-3, dBASE II, III, and III Plus, R:base 4000, MultiMate, Wordstar, WordPerfect, and Symphony.

C. Modem Needs

At the present time, the RMPC has two 1200 baud modems and one 2400 baud modem for accessing the CWT recovery files. These will be supplanted by at least two 19,200 baud modems to accommodate data users who wish to transfer data at high speed. Telebit now markets a reliable 19,200 baud modem which uses voice grade phone lines and costs approximately \$1,350. However, because of the lack of industry standards yet for high speed modems, the remote site modems must also be Telebit in order for the error check protocols to function properly. Obviously, this isn't a serious drawback in order to transmit at 19,200 baud.

V. Staffing Needs

As noted earlier, the staffing of the Mark Center was originally intended to consist of a Mark Coordinator/Data Manager position and a Computer Assistant position. This was the case from 1979 to 1982. However, with the departure of Graham King in 1982, the Mark Center has been run by Ken Johnson with only occasional periods of part-time

assistance. The work load of the current Mark Center operations has now reached the point that, at a minimum, a half time position must be added in October at the beginning of FY 1988.

It is also very evident that the new PSC requirements will impose a major work load on the operation of the Mark Center. At a minimum, this impact is estimated to require at least six man-months.

It will therefore be necessary to add a full staff position to the RMPC in order to cope with both current and new duties. A Computer Technician will be recruited at an annual cost of approximately \$30,000 (total includes fringe benefits).

VI. Summary of Costs

A number of costs will be incurred in order for the RMPC to meet the new information requirements of PSC. A break-out of the estimated costs are summarized below.

<u>Task</u>	<u>Cost</u>
A. Programming (Contract Bid)	\$ 15,000
B. Computer Replacement	
1) purchase option	\$100,000 (\$80,000-\$120,000 range)
2) lease option (5 year)	\$ 25,000 (\$20,000-\$30,000/yr range)
C. 19.2K Modems (2)	\$ 2,700 (\$1,350 each)
D. Computer Assistant Position (12 man months)	\$30,000
Totals: \$ 72,700 - first year	
(using lease options) \$ 55,000 - successive years thereafter	

The RMPC budget does not have any surplus funds because of successive budget cuts over the past several years. Therefore, new funds must be found in order for the RMPC to provide the requested services as an interim system for PSC. As all major users benefit, they will be expected to share in providing the necessary financial help in order to meet the new costs. PMFC is also prepared to assist in the funding.

On a related note, a PSC sponsored meeting will be held on August 11th in Seattle to address the entire issue of funding for tag recovery programs and the need for coordination of release and recovery programs. PMFC will argue at that meeting that the cost of operating the Mark Center is one of the costs that all users of CWT data should share in as well as in the recovery costs.

FEATURES FOR A U.S. SECTION PSC CWT DATA BASE

Data Item Definitions

- Complete on-line interactive documentation of data fields and values. A standard process shall be implemented and maintained for keeping this documentation current.
- The following data in PSC standard format: all relevant release data, both tagged, untagged and total production, from all release agencies; and all recovery and catch/sample data from all PSC recovery agencies.

Data Integrity

- Data range and integrity checks according to the PSC data criteria at data base load time. The responsibility for data accuracy, however, is the submitting agency. Only authorized persons in the submitting agency, or the Data Base Administrator with prior agency authorization, have update permission on the data.
- An audit trail generated by the data base update process to document currency of data.
- Public access to the entire data base with read permission.

Data Updates

- On-line capability of adding new data records and making updates or deletions to data values through a standard data loading process. (This is the process that will perform the error checks.)
- Capability to easily add (or delete) data elements in conjunction with PSC standards (e.g., in the future adding effort data).
- On-line documentation of current data update levels.

Data Communications

- One logical data set maintained on a network supporting services specified for the Application Layer in the ISO Reference Model for open systems interconnect.
- Ready dial-up access to nodes via micro or terminal. Ready access includes 1200 baud (Bell 212A) and 2400 baud (CCITT-V22-BIS) capability; at the high end at least 9600 baud capability; and, that the data base be immediately available upon logon (ie, without operator intervention).

FEATURES FOR A U.S. SECTION PSC CWT DATA BASE
Page 2

- Data compression capability for more efficient transmission of data.

Data And Information Retrieval

- Concurrent access to data/text files.
- Simultaneous availability of new and updated data to all users.
- Ad hoc and standardized retrieval and report capability, including data selection, data aggregation (including, for example, association algorithms to tie tagged to untagged groups and capability for elementary analyses such as calculation of harvest rates).

System Support

- Complete, clear and easy to understand system documentation.
- Availability of introductory training.
- Nine-track tape and floppy disk data exchange capability in standard PSC protocol (not yet determined). All agency data submissions to the data base shall be provided in one of these media.
- Seven days a week and 24 hours per day machine access capability. Interruption of service exceeding one week due to downtime is unacceptable. (At the very least, service interruptions are expected to be corrected during normal working hours.)
- Central management and responsibility of the networked data base and system.
- Maintain, in a secure environment, a current archival backup at all times.
- Careful monitoring of system performance, usage and user satisfaction.

Further recommendations about the system are:

- A PSC standing oversight committee should be formed with the following duties: establish and maintain policies and procedures of the coastwide data base, and approve equipment upgrades and system software revisions, and; annually review the coastwide data base system, to assess successes, failures and new needs and report these along with its recommendations to the Data Sharing Committee.
- We project that all historic CWT related data through 1990 will take up 500 megabytes of storage. Assuming it is desired to maintain all that data on disk, our recommendation is that the system be designed to accommodate at least that amount of on-line data.
- We anticipate that the system will experience considerable growth in usage. Because of this, we recommend that it be designed so that both hardware and software can be readily enhanced. In as far as it is possible, the intent here, is to have upgrades be transparent to the user.

System features we agreed were not necessary are:

- Electronic mail capability.
- Interactive statistical analysis capability.
- Electronic transfer capability of large data sets (over 5 megabytes) across dial-up lines.
- Comprehensive and dedicated system/data base consulting service.

Additional issues we felt the Data Sharing Committee should be alerted to are:

- Equitable costs for using the system (both computer and communication) need to be worked out. The W/G did not feel it was within its terms of reference to do that. We did feel it was important, however, to alert Data Sharing that how costs for usage were set up and distributed might be an issue.
- There may be considerable difficulty in coordinating and collecting data in a timely manner, given current agency personnel workloads. In addition, some data elements may be impossible to extract from past releases and recoveries. This problem needs to be addressed.
- A schedule needs to be set for compiling the data into the data base. The questions that have to be addressed are: which historic CWT data need to be compiled, with what priorities, and what deadlines?



STATE OF WASHINGTON
DEPARTMENT OF FISHERIES

115 General Administration Building • Olympia, Washington 98504 • (206) 753-6600 • (SCAN) 234-6600

February 9, 1988

RECEIVED

Dr. Donald Bevan
Co-Chairman, PCS Data Sharing Committee
Office of the Dean, HA-20
College of Ocean and Fishery Science
University of Washington
Seattle, Washington 98195

000090

FEB 20 1989
PACIFIC SALMON
COMMISSION

Dear Dr. Bevan:

Per your instruction, additional information is provided below on the background and rationale of the U.S. Section Working Group on Mark Recovery Databases' January 18 recommendations for a preferred system for PSC data sharing.

As you will recall, the Data Sharing Committee met on February 18, 1986 and established the Working Group on Mark Recovery Databases to evaluate existing databases and to define necessary data elements and standards needed to meet PSC informational needs. A number of specific assignments were given at that time. Of these, the sixth (and last) task was to:

"Recommend a preferred system to be adopted coastwide; and project time required before the system could be fully operational."

In addressing this assignment, the Working Group first focused on the necessary data elements and developed new data formats for ensuring standardized data exchange. The W/G then expanded its deliberations to include discussion of how the databases might be accessed and managed.

A bilateral W/G meeting in Seattle (June 14, 1987) resulted in the recommendation that an "Interim System" first be established as a precursor to the "Preferred System". It was further agreed that the Pacific Marine Fisheries Commission's Mark Center would be recommended to function as the interim system until such time as the preferred system could be implemented. PMFC was also asked to develop a proposal detailing costs for implementing the interim system.

The PMFC proposal was considered during a subsequent bilateral W/G meeting on August 5, 1987. Problems arose, however, when the Canadians took the position that the issue was one of data exchange between the U.S. and Canada. As such, they rejected having a single database site for both the U.S. and Canada.

The U.S. Section of the W/G shifted its emphasis to developing features of a preferred U.S. system that would meet PSC informational needs. The approach taken was one of first "greenlighting" desirable features and then later

selecting essential features. The U.S. members also continued an evaluation of alternative scenarios for siting and managing a PSC-preferred system.

At the PSC meetings in Portland (November 15-20, 1987), Mr. Shinners (Canadian Commissioner) stated that Canada intended to maintain its own CWT database rather than support a single bilateral system that would be maintained by a third party system. This action effectively ruled out a PSC-based CWT database. It also compelled the U.S. to identify a single site for processing and exchanging U.S. data with Canada. The U.S. Commissioners announced on December 17, 1987, that PMFC's Mark Center had been selected to serve as the U.S. site for exchanging PSC data with Canada. Given these decisions, and not because it had finished its technical considerations, the U.S. Section of the W/G cut short its work on a preferred system.

Accordingly, when the U.S. Section of the W/G met again January 18, 1988, to finalize its recommendations on a preferred system, there was unanimous agreement to support PMFC's Regional Mark Center as the preferred system for PSC data sharing at this point in time. There was also unanimous agreement that as the information systems and needs of participating PSC agencies continue to evolve, every effort should be made to include preferred features such as networking, one logical data set, etc., in the PSC database assuming, of course, that these would prove to be cost-effective.

There are a number of advantages in selecting PMFC's Mark Center. These advantages include the following:

1. The RMPC has many years of experience (1976-present) in collecting, storing, and distributing CWT-related data from all jurisdictions on the West Coast.
2. All tagging and recovery agencies on the West Coast, including those in British Columbia, are represented on the "Mark Committee" which is responsible for establishing regional marking agreements.
3. Reporting and coordination procedures are well established and voluntarily adhered to by all tagging and recovery agencies.
4. The RMPC's CWT database includes data from non-PSC participants, and as a result, will continue to exist regardless of the site for the PSC database. Consequently, use of the RMPC avoids the undesirable existence of two overlapping regional CWT databases.
5. No PSC start-up costs are required since the RMPC already has computer hardware, software, office space, and a staff of two in place.
6. PMFC is also proceeding with a substantial upgrade of the RMPC operations at no cost to PSC. To date, \$205,000 in new funds has been raised from PMFC's member states, the U.S. Fish & Wildlife Service, and Bonneville Power Administration. Additional funds are also expected from the two tribal commissions, Northwest Indian Fisheries

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Commission and Columbia River Inter-Tribal Fish Commission. The upgrade includes the purchase of a MicroVAX minicomputer, a programmer, and software enhancements to facilitate on-line retrieval of CWT recovery data.

7. Minimal time (2-3 months maximum) will be required for the RMPC to implement the new PSC formats since an operating system is already in place and only needs modification. Data validation and exchange capabilities should be operational by mid-March 1988.
8. Finally, PMFC is widely viewed as not having a potential vested interest in the interpretation of any fisheries data. As such, it can be viewed as a neutral site.

Possible disadvantages of the RMPC, on the other hand, include the following:

1. PMFC has no legal authority to compel data sharing or enforce timeliness of reporting.
2. PSC data needs might suffer at the expense of non-PSC data commitments of the RMPC (i.e., PSC and RMPC priorities may be different).
3. Establishing PMFC as the management agency may introduce problems associated with having an extra organizational layer.

None of these three disadvantages, however, appears to be unresolvable. The problem with legal authority and clout, for example, can be solved by PSC asserting its authority and requiring the PSC participant agencies to report their respective data to the RMPC in the required time periods. Similarly, the issues of potential conflicts in data processing priorities and management problems likely can be met by establishing an oversight committee that works closely with the RMPC to ensure that PSC informational needs are being met as required.

Having considered the above various advantages and disadvantages, the majority of the U.S. Section W/G is of the opinion that PMFC's Mark Center will be able to serve PSC data needs effectively. In addition, the Mark Center is seen as providing the most efficient transition to eventually establishing all of the preferred features of a PSC database.

I trust that this information will explain the rationale for the recommendations of the U.S. Section Working Group on Mark Recovery Databases to the Data Sharing Committee.

Sincerely,



Frank de Libero
 Chairman, U.S. Section
 Working Group on Mark Recovery Databases

APPENDIX 6.2

The Canadian position on an "Ideal System" would be to exchange data in the proposed format, but in a more timely manner (electronically and on demand). We do not believe that the system should be more than the exchange of data. Analyses can be carried out jointly, but separate systems (American and Canadian) would be maintained.

APPENDIX 6.3

PSC Standard Coastwide Coded Wire Tag Data Set Exchange Protocol

PURPOSE

The Working Group on Mark/Recovery Databases recommends the Standard Coastwide Coded Wire Tag Data Set be implemented as two identical data sets. The agencies recommended to administer the data sets are CDOF in Nanaimo for the 'A' copy, and PMFC's RMPC in Portland for the 'B' copy.

To assist the two data set administrators (DBAs) in developing their management procedures, a number of important considerations follow. Some of these address broad architectural concerns, while others, due to their importance, are quite detailed.

A WORKING GROUP ON TECHNICAL DATA MANAGEMENT

The PSC should assign Data Sharing Committee, working through the recommended working group on technical data management, the task of overseeing coastwide codes and formats for this and other data sets. In this case the work includes accepting periodic status reports from the DBAs on the state of the system, resolving any disagreements between the DBAs regarding the common methodology, and formally revising the specifications of the data exchange process.

RESPONSIBILITY FOR DATA ACCURACY

Each reporting agency is ultimately responsible for the accuracy of its data. It is recommended that each agency pre-audit its submissions to the coastwide data set using the standard validation rules defined in this report. This simple precaution can greatly simplify management of the data sets.

It is also recommended that corrections to data be made by the reporting agency and then submitted to the data set as an update. This should materially reduce the chance of the data sets diverging.

RESPONSIBILITY FOR DATA VALIDITY

In the current context, data validity is defined as conformity with the section of this report describing validation rules. Data validity in the coastwide data set is the responsibility of the DBAs, not the users. It is strongly recommended each DBA ensure validity by pre-auditing all agency submissions to the coastwide data set. Invalid submissions are not to be installed into the data set.

The case of items using the 'at' (@) flag is special. 'At' may validly occur in submissions as an indicator of needed format revisions. Loading 'at' records into the coastwide data set is not allowable. A submission is considered valid if it meets the validation rules. It may be installed in the data set, with the exception that individual 'at' records are blocked from installation.

DATA FLOW

Recommended data flow for the system is illustrated in the attached data flow diagram. Only the highest level has been represented.

CRITICAL POINTS IN THE DATA FLOW

The process labeled 'Bilateral Concurrence' is the single method for maintaining identical data sets. It should be implemented with the utmost skill and formality. In particular, detailed written records indicating concurrence on every update should be jointly maintained in a common format.

Synchronized parallel updates should be periodically performed, with identical transactions updating the data sets.

The 'Divergence Audit' process is intended to point out that the data sets are no longer identical. However, due to the expected scale of data and the physical separation between the copies, it is not practical to expect to be able to ever perform a direct comparison of the two data sets. Instead, the audit must rely on comparing corresponding status items which record parameters of each data set update transaction. This suggests the need to carefully identify standard methods for naming individual submissions and tracking them through the update (or rejection).

Status parameters that are tracked must be sufficient for the audit to determine that the databases do not diverge. However, additional details of each submission must also be tracked to ensure that new versions of previously submitted data replace the old copies, rather than coexist with them.

PSC Standard Coastwide Coded-Wire Tag Dataset Exchange

