

Southeast Sustainable Salmon Fund Final Report for Approved Projects

Project Number: 45225

Project Title: Kuskokwim, Yukon and Kotzebue Data Rescue, Correction and Standardization

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Abstract: Age, sex, and length data have been collected from salmon in the Yukon Area since 1960, in the Kuskokwim Area since 1961 and in the Kotzebue Area since 1962. However, no formal archiving system was established for the Arctic Yukon Kuskokwim (AYK) Region and much of these electronic data have been lost. An overall goal for AYK Region is to provide managers, researchers and public entities involved in salmon fisheries in AYK a system to enter and process new data as well as retrieve historic data. This goal will be achieved through a series of projects from various funding sources. Projects will have complementary objectives and focus on tasks pertinent to the funding agency (Figures 1 and 2). The main objective of this project was to aggregate, error-check, and correct historic chinook, coho, sockeye, and pink salmon age, sex, length (ASL) data from the Yukon, Kuskokwim, and Kotzebue areas. Standardizing data formats for inclusion into a centralized database was a secondary objective. The project goal is to incorporate all salmon ASL data collected in the AYK Region over the past forty years into the region's database management system, under development. The main accomplishment of this project was loading, validating and correcting 508 ASL data files representing 219,616 salmon into databases. The majority of these were chinook and coho salmon from the Yukon and Kuskokwim areas. Technicians keyed an additional 143 handwritten Yukon ASL files representing 30,711 chinook

salmon into databases. Aggregation and correction efforts for data relevant to this project were brought to 81% completion.

Approach:

Age, sex, and length (ASL) data are collected annually from salmon sampled from commercial harvests and escapement, run timing and abundance monitoring projects in the AYK Region. Scales are collected from salmon at these projects primarily to determine the age of fish, but may also be examined for growth patterns. Salmon length is generally represented by a measurement in millimeters from mid-eye to fork of tail. Sex of the salmon are determined from either external characteristics or internal inspection of reproductive products.

We defined an individual ASL data file to be a unique data set for a particular species, year, gear, project, and location combination since this is how the data are collected and scales and/or data forms are filed in the Anchorage scale archives. Usually an escapement project has one file per species per year, but changes in gear during the season can increase this number. Also, chinook, coho, sockeye, and pink salmon data from the Yukon, Kuskokwim, and Kotzebue areas will be referred to as focus group data in this report.

A research analyst loaded previously recovered text data files for the focus group into Access databases using a parsing and data loading program (developed under United States Fish & Wildlife Service Office of Subsistence Management funding). Data from different areas were loaded into separate databases to facilitate editing and error-checking; hand-entered data and data found in electronic format were also kept in separate databases to address errors introduced during the data entry process.

The file cabinets in the region's scale archives were searched for paper copies of missing data not recovered during previous ASL data-related projects. These paper copies include handwritten forms (used from 1960 - 1983) and OpScan mark-sense forms (1984 - present). Older mark-sense forms (read by OPSCAN 90/20 scanners) cannot currently be recovered because these outdated OPSCAN readers cannot be properly calibrated. Handwritten files were recovered by manually entering these data using an Access data entry form created during a previous project. Duplicate copies of the data were removed from many of the files. An ADF&G technician and a data entry company (Motznik Information Services) keyed data from handwritten forms into an Access database.

Numerous error-checking protocols were developed to validate the data. Header records, which identify the sample, had to be carefully checked before loading data into the database. Many files had missing or incorrect location, project, gear, and date information, all of which are crucial to identifying where, when, how the data were collected. Database queries

that identify length and age data outside of realistic ranges, files with more than one location, project, or species code, and duplicate header or fish data were also written for post-loading data validation.

Programmers working on the project drafted a database structure to optimize data storage efficiency and compatibility with other data sets. Age data from 1960 – 1982 were converted from older Gilbert-Rich age notation to the now-standard European format (Gilbert and Rich 1927, and Conseil Permanent International Pour l'Exploration de al Mer, Copenhagen, 1934). A query to generate a dynamic inventory of data in the ASL database was also created. The query builds a table describing the number of individual fish samples by species, year, district, and subdistrict.

Results/Findings: The main accomplishment of this project was the addition of 651 ASL data files representing 250,327 sampled salmon into AYK databases. A total of 508 electronic ASL data files representing 219,616 sampled salmon were validated, corrected, and loaded into databases. A department technician keyed 143 handwritten Yukon files representing 30,711 chinook salmon. Motznik Information Services is currently keying an additional 83 handwritten files consisting mostly of Yukon chinook and coho samples. Ten files were too irregular for third party data entry and will be entered by project staff.

The majority of the ASL samples were from chinook and coho salmon from the Yukon and Kuskokwim areas (Table 1) Data recovered during this project are summarized by species and area in Table 1. The “Total % Files Loaded or Entered in Database” row indicates what percent of the total files for each area have been loaded or entered into a database. “Total % Files Inventoried in Electronic Format” indicated what percent of the total files for each area have been located electronically as text files. Almost all ASL data files located electronically have now been loaded.

A final ASL database structure was developed and the multiple ASL databases in various formats were converted and combined into the new configuration. All age data were successfully converted to the modern age notation. Data have not yet been released to the public because a thorough managerial review is needed to ensure its validity.

Evaluation: Data aggregation and correction efforts were successful, bringing the focus group to 81% completion (Table 1). However, some files had grossly incomplete or inconsistent header data and will have to be checked against hardcopy forms. Also, a small amount of recent data is in Excel spreadsheets, and must be manually converted to standard text format

before it can be added to the database. We still have not decided how to recover the data from the obsolete mark-sense forms.

The secondary objective of standardizing data formats for database inclusion was also largely successful. Previous ASL database structures were altered and combined. The conversion of age data also allows for the meaningful combination of ASL data from before and after 1982.

Data are not yet available to the public because biologists and fisheries managers have not yet performed a thorough, critical review. Also, a versatile interface to allow public entities to make meaningful data queries still needs to be developed. Data will be released once the needs of a suitable data review and interface have been addressed.

As stated in our proposal this project's funding was to enable us to efficiently organize and correct data that were not covered by other funding (Hamner et al. 2003a, 2003b, and Hamner et al. 2004); particularly rescanning and keying ASL data. In this we have been successful. Funding from other projects will allow us to continue development of a database management system (Figures 1 and 2) which will include ASL as well as other data types accessible through the internet (Hamner et al. 2003).

Project Products: Inventories of ASL data in our database by area, project, year, and species are included as Appendices A through D. Figure 2 shows this project's objectives in the larger scheme of the AYK database development Project.

Key Words: Kuskokwim, Kotzebue, Norton Sound, Yukon, Port Clarence, chinook salmon, sockeye salmon, coho salmon, *Oncorhynchus spp*, salmon age, sex and size, Bering Sea, fisheries management, fisheries database, western Alaska, Arctic-Yukon-Kuskokwim Region, AYK Region

Literature Cited: Conseil Permanent International Pour l'Exploration de al Mer, Copenhagen. 1934. Report of the meeting of salmon and trout experts in Poland, October 1933. Rapp. et Proc.-Verb. 91:3-10.

Gilbert, C.H., and W.H. Rich. 1927. Second experiment in tagging salmon in the Alaska Peninsula fisheries reservation, summer of 1923. Bull. U.S. Bur. of Fisheries, 42: 27-75.

Hamner, H. H., S. Karpovich, and S. StClair. 2003a. Norton Sound salmon file inventory and problem review. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 3A03-01, Anchorage.

Hamner, H. H., S. Karpovich, and S. StClair. 2003b. Deveop shared fishery database. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A03-23, Anchorage.

Hamner, H. H., S. St Clair, and H. Moore. 2004. An inventory of age, sex and length data for Norton Sound, Kotzebue, and Kuskokwim chum salmon. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A04-06, Anchorage.

Table 1. Number of salmon loaded during this project by species and area and total project progress.

| | | Species | | | | | |
|------|--------------|---|----------------|---------------|---------------|------------|----------------|
| | | Chinook | Coho | Sockeye | Pink | TOTAL | |
| Area | Yukon | # of Fish Loaded or Entered into Database During This Project | 41,732 | 27,848 | 107 | 3 | 69,690 |
| | | Total % Files Loaded or Entered in Database | 79% | 64% | 62% | 0% | 77% |
| | | Total % Files Inventoried in Electronic format | 80% | 68% | 77% | 100% | 78% |
| | Kuskokwim | # of Fish Loaded or Entered into Database During This Project | 72,430 | 56,196 | 51,833 | 39 | 180,498 |
| | | Total % Files Loaded or Entered in Database | 90% | 92% | 89% | 18% | 89% |
| | | Total % Files Inventoried in Electronic format | 91% | 92% | 90% | 18% | 90% |
| | Kotzebue | # of Fish Loaded or Entered into Database During This Project | 43 | 1 | 5 | 90 | 139 |
| | | Total % Files Loaded or Entered in Database | 80% | 25% | 75% | 50% | 60% |
| | | Total % Files Inventoried in Electronic format | 80% | 25% | 75% | 50% | 60% |
| | TOTAL | # of Fish Loaded or Entered into Database During This Project | 114,205 | 84,045 | 51,945 | 132 | 250,327 |
| | | Total % Files Loaded or Entered in Database | 82% | 76% | 87% | 21% | 81% |
| | | Total % Files Inventoried in Electronic format | 83% | 79% | 83% | 83% | 82% |

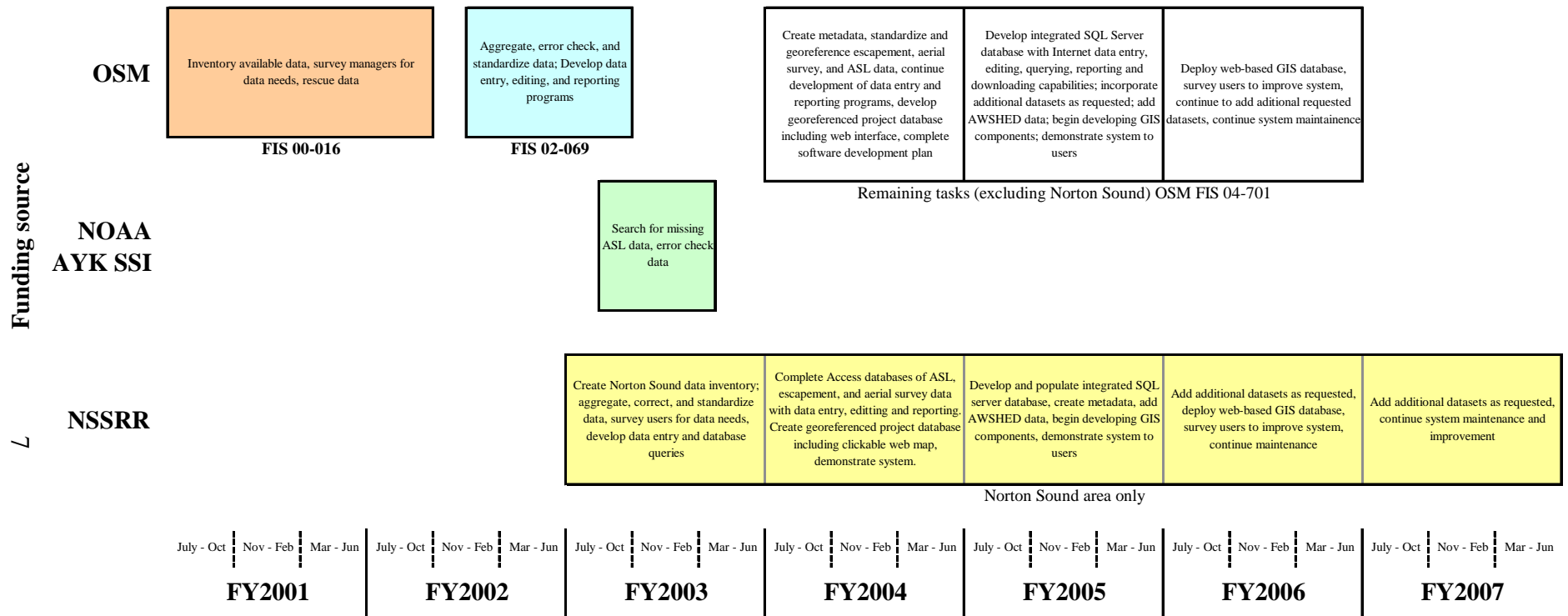


Figure 1. Project timeline for development of the AYK database management system. (OSM= USFWS Office of Subsistence Management; AYK SSI= AYK Sustainable Salmon Initiative, NOAA=National Oceanic and Atmospheric Administration, NSSRR= Norton Sound Salmon Research and Restoration, FY is state fiscal year)

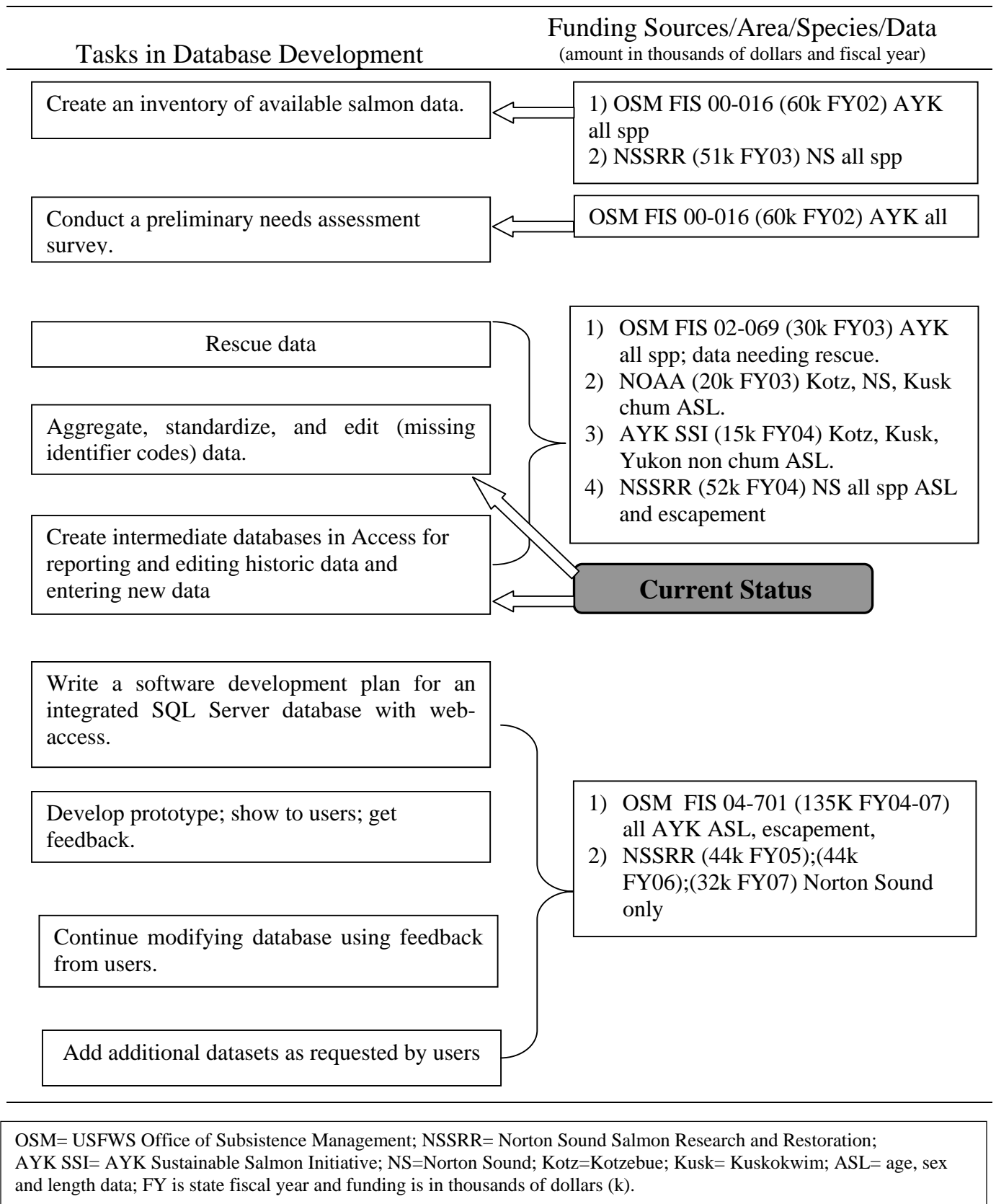


Figure 3. Tasks for development of the AYK database management system including funding sources, amounts by fiscal year, and area. Not included are state general fund support of an Analyst/programmer IV, Analyst/programmer III, and a Research Analyst I (\$150k annually).

| Project Type | Year | Chinook | Coho | Sockeye | Pink | Total |
|---------------------|--------------|----------------|---------------|----------------|--------------|----------------|
| Commercial Catch | 2003 | 2,840 | 530 | | | 3,370 |
| | 2002 | 2,993 | | | | 2,993 |
| | 2001 | 105 | | | | 105 |
| | 2000 | 1,320 | 150 | | | 1,470 |
| | 1999 | 5,667 | 650 | 1,029 | | 7,346 |
| | 1998 | 5,377 | 1,469 | 2,260 | | 9,106 |
| | 1997 | 6,060 | 2,664 | 2,170 | | 10,894 |
| | 1996 | 6,120 | 2,725 | 1,697 | | 10,542 |
| | 1995 | 5,452 | 1,691 | 1,483 | | 8,626 |
| | 1994 | 5,026 | 2,268 | 830 | | 8,124 |
| | 1993 | 5,161 | 1,310 | 830 | | 7,301 |
| | 1992 | 6,090 | 2,408 | 1,737 | | 10,235 |
| | 1991 | 5,758 | 2,554 | 1,578 | | 9,890 |
| | 1990 | 5,403 | 2,157 | 1,586 | | 9,146 |
| | 1989 | 5,124 | 3,165 | 1,647 | | 9,936 |
| | 1988 | 7,392 | 3,738 | 2,249 | | 13,379 |
| | 1987 | 1,656 | 1,919 | 1,375 | | 4,950 |
| | 1986 | 6,668 | 2,453 | 1,191 | | 10,312 |
| | 1985 | 7,521 | 2,701 | 1,910 | | 12,132 |
| | 1984 | 6,234 | 3,337 | 1,563 | | 11,134 |
| | 1983 | 7,642 | 2,096 | 1,568 | | 11,306 |
| | 1982 | 4,446 | 905 | 575 | | 5,926 |
| | 1981 | 6,262 | 1,079 | 812 | | 8,153 |
| | 1980 | 3,216 | 999 | 277 | | 4,492 |
| | 1979 | 2,396 | | 30 | | 2,426 |
| | 1978 | 2,194 | 1,141 | 200 | 90 | 3,625 |
| | 1977 | 2,730 | 1,089 | 453 | | 4,272 |
| | 1976 | 1,914 | 630 | 270 | | 2,814 |
| | 1975 | 1,896 | 445 | 285 | | 2,626 |
| | 1974 | 2,766 | 899 | 747 | 1 | 4,413 |
| | 1973 | 2,780 | 211 | | | 2,991 |
| | 1972 | 1,848 | 137 | 56 | | 2,041 |
| | 1971 | 2,111 | 310 | | | 2,421 |
| | 1970 | 539 | | 241 | | 780 |
| 1969 | 1,657 | 80 | 643 | | 2,380 | |
| 1968 | 2,418 | 213 | 190 | 1 | 2,822 | |
| 1967 | 1,981 | 370 | 22 | | 2,373 | |
| 1966 | 537 | 189 | | | 726 | |
| 1965 | 472 | 60 | 119 | | 651 | |
| 1964 | 887 | | 480 | | 1,367 | |
| 1963 | | 25 | | | 25 | |
| 1962 | | | | | 0 | |
| 1961 | | 61 | | | 61 | |
| | Total | 148,659 | 48,828 | 32,103 | 92 | 229,682 |

| Project Type | Year | Chinook | Coho | Sockeye | Pink | Total |
|-------------------------------|-------------|----------------|--------------|----------------|-------------|---------------|
| Escapement (spawning grounds) | 2003 | 1,084 | | | | 1,084 |
| | 2002 | 705 | 60 | | | 765 |
| | 2001 | 1,348 | | | | 1,348 |
| | 2000 | 795 | 35 | | | 830 |
| | 1999 | 1,160 | | | | 1,160 |
| | 1998 | 492 | 221 | | | 713 |
| | 1997 | 1,738 | 391 | | | 2,129 |
| | 1996 | 1,415 | 653 | | | 2,068 |
| | 1995 | 2,069 | 381 | | | 2,450 |
| | 1994 | 1,732 | 384 | | | 2,116 |
| | 1993 | 1,737 | 299 | | | 2,036 |
| | 1992 | 1,928 | 290 | | | 2,218 |
| | 1991 | 1,973 | | | | 1,973 |
| | 1990 | 4,187 | | | | 4,187 |
| | 1989 | 2,358 | 261 | 101 | | 2,720 |
| | 1988 | 3,195 | | 9 | | 3,204 |
| | 1987 | 415 | 247 | 462 | | 1,124 |
| | 1986 | 397 | 300 | | | 697 |
| | 1985 | 2,990 | | 29 | | 3,019 |
| | 1984 | 3,242 | 343 | 434 | | 4,019 |
| | 1983 | 1,626 | | 20 | | 1,646 |
| | 1982 | 1,687 | | 1 | | 1,688 |
| | 1981 | 3,964 | 458 | | | 4,422 |
| | 1980 | 872 | | | | 872 |
| | 1979 | 471 | | | | 471 |
| | 1978 | 200 | | | | 200 |
| | 1977 | 116 | | | | 116 |
| | 1976 | 168 | | | | 168 |
| | 1975 | 298 | | | | 298 |
| | 1974 | 4 | | | | 4 |
| | 1973 | 136 | | | | 136 |
| | 1972 | 604 | | | | 604 |
| | 1970 | 200 | | | | 200 |
| | 1968 | 109 | | | | 109 |
| 1967 | 83 | | | 10 | 93 | |
| 1965 | | | | | 0 | |
| 1963 | | | | 8 | 8 | |
| Total | | 45,498 | 4,323 | 1,074 | 0 | 50,895 |

| Project Type | Year | Chinook | Coho | Sockeye | Pink | Total |
|---------------------------------------|-------------|----------------|---------------|----------------|-------------|---------------|
| Escapement (tower, weir, sonar, etc.) | 2003 | 3,212 | 718 | 9 | | 3,939 |
| | 2002 | 2,031 | 301 | | | 2,332 |
| | 2001 | 2,481 | 330 | | | 2,811 |
| | 2000 | 1,493 | 514 | | | 2,007 |
| | 1999 | 1,444 | 1,904 | 921 | | 4,269 |
| | 1998 | 1,396 | 1,354 | 634 | | 3,384 |
| | 1997 | 2,220 | 1,201 | 1,741 | | 5,162 |
| | 1996 | 1,869 | 1,265 | 289 | | 3,423 |
| | 1995 | 1,507 | 1,439 | 738 | | 3,684 |
| | 1994 | 1,586 | 863 | 377 | 35 | 2,861 |
| | 1993 | 1,026 | 930 | 876 | | 2,832 |
| | 1992 | 1,811 | 696 | 1,076 | | 3,583 |
| | 1991 | 1,052 | 1,628 | 544 | | 3,224 |
| | 1990 | 1,364 | 247 | 330 | | 1,941 |
| | 1989 | 303 | 69 | 149 | | 521 |
| | 1988 | 956 | 1,210 | 979 | | 3,145 |
| | 1987 | 534 | 682 | 933 | | 2,149 |
| | 1986 | 935 | 372 | 489 | | 1,796 |
| | 1985 | 1,325 | 890 | 786 | 2 | 3,003 |
| | 1984 | 1,690 | 1,367 | 1,018 | | 4,075 |
| | 1983 | 700 | 1,049 | 117 | | 1,866 |
| | 1982 | 568 | 171 | 6 | | 745 |
| | 1981 | 1,106 | 473 | 53 | | 1,632 |
| | 1980 | 40 | 27 | 25 | | 92 |
| | 1979 | 450 | | 545 | | 995 |
| | 1978 | 611 | | 269 | | 880 |
| | 1977 | 118 | | | | 118 |
| | 1976 | 461 | | 175 | | 636 |
| | 1975 | 27 | | | | 27 |
| | 1973 | | | | | 0 |
| | 1972 | 4 | | | | 4 |
| | 1971 | 23 | | | | 23 |
| 1968 | | | | 2 | 2 | |
| 1964 | | | | | 0 | |
| Total | | 34,343 | 19,700 | 13,081 | 37 | 67,161 |

| Project Type | Year | Chinook | Coho | Sockeye | Pink | Total |
|--------------------------|---------------|----------------|-------------|----------------|---------------|--------------|
| Sport Catch (freshwater) | 2000 | | | | | 0 |
| | 1997 | | 10 | | | 10 |
| | 1996 | 35 | 233 | | | 268 |
| | 1995 | | 102 | | | 102 |
| | 1988 | | | | | 0 |
| | 1985 | 24 | | | | 24 |
| | 1984 | 5 | | | | 5 |
| | 1963 | | 6 | | | 6 |
| | Total | 64 | 351 | 0 | 0 | 415 |
| Sport Catch (marine) | 1998 | 56 | | | | 56 |
| | 1983 | 61 | | | | 61 |
| | 1980 | 1 | | | | 1 |
| | Total | 118 | 0 | 0 | 0 | 118 |
| Subsistence Catch | 2003 | 1,046 | | 20 | | 1,066 |
| | 2002 | 944 | 151 | | | 1,095 |
| | 2001 | 1,370 | 22 | | | 1,392 |
| | 2000 | 149 | | | | 149 |
| | 1999 | 418 | | | | 418 |
| | 1998 | 146 | | | | 146 |
| | 1997 | | 1 | | | 1 |
| | 1996 | 5 | | | | 5 |
| | 1995 | 650 | 40 | 1 | | 691 |
| | 1994 | 304 | | | | 304 |
| | 1993 | 717 | | | | 717 |
| | 1992 | 278 | 51 | | | 329 |
| | 1991 | 83 | 15 | | | 98 |
| | 1990 | 40 | | | | 40 |
| | 1989 | 346 | 107 | | | 453 |
| | 1988 | 995 | 88 | 30 | | 1,113 |
| | 1987 | 466 | | 43 | | 509 |
| | 1986 | 1,160 | | | | 1,160 |
| | 1985 | 263 | | | | 263 |
| | 1984 | 440 | | | | 440 |
| | 1983 | 67 | 5 | | | 72 |
| | 1982 | 110 | 203 | | | 313 |
| | 1980 | | | | 314 | 314 |
| | 1979 | 173 | | | | 173 |
| | 1978 | 154 | | | | 154 |
| | 1977 | 247 | | | | 247 |
| | 1976 | 83 | | | | 83 |
| | 1975 | 59 | | | | 59 |
| | 1968 | | | | | 0 |
| | 1964 | | | | | 0 |
| Total | 10,713 | 683 | 408 | 0 | 11,804 | |

| Project Type | Year | Chinook | Coho | Sockeye | Pink | Total |
|---------------------|--------------------|----------------|---------------|----------------|--------------|----------------|
| Test Fishing | 2003 | 1,955 | 573 | | | 2,528 |
| | 2002 | 3,427 | 512 | 9 | | 3,948 |
| | 2001 | 2,508 | 775 | | | 3,283 |
| | 2000 | 3,061 | 929 | | | 3,990 |
| | 1999 | 2,252 | 611 | 3 | | 2,866 |
| | 1998 | 2,104 | 895 | | | 2,999 |
| | 1997 | 2,703 | 741 | | | 3,444 |
| | 1996 | 1,841 | 1,321 | | | 3,162 |
| | 1995 | 728 | 869 | 954 | | 2,551 |
| | 1994 | 2,641 | 3,064 | 961 | | 6,666 |
| | 1993 | 2,417 | 767 | | | 3,184 |
| | 1992 | 445 | 1,179 | | | 1,624 |
| | 1991 | 604 | 424 | 2 | | 1,030 |
| | 1990 | 695 | 916 | | | 1,611 |
| | 1989 | 592 | 613 | 7 | | 1,212 |
| | 1988 | 440 | 793 | 2 | | 1,235 |
| | 1987 | 800 | 712 | 3 | | 1,515 |
| | 1986 | 62 | 215 | | | 277 |
| | 1985 | 688 | 1,514 | | | 2,202 |
| | 1984 | 670 | 1,518 | 1 | | 2,189 |
| | 1983 | 1,149 | 1,030 | 12 | | 2,191 |
| | 1982 | 736 | 343 | | | 1,079 |
| | 1981 | 805 | 103 | 870 | 1 | 1,779 |
| | 1980 | 930 | 301 | 669 | | 1,900 |
| | 1979 | 467 | | 1 | | 468 |
| | 1978 | 1,114 | | 211 | | 1,325 |
| | 1977 | 222 | | 108 | | 330 |
| | 1976 | 1,193 | | 200 | | 1,393 |
| | 1975 | 840 | 1 | 143 | | 984 |
| | 1974 | 195 | 248 | 297 | | 740 |
| | 1973 | 659 | | 29 | | 688 |
| | 1972 | 640 | | 7 | | 647 |
| | 1971 | 314 | | 41 | | 355 |
| 1970 | 104 | | | | 104 | |
| 1969 | 1,654 | | | | 1,654 | |
| 1968 | 154 | | | | 154 | |
| 1967 | 165 | | 43 | | 208 | |
| 1966 | 5 | | | | 5 | |
| | Total | 41,979 | 20,967 | 4,573 | 1 | 67,520 |
| All Projects | Grand Total | 281,374 | 94,852 | 51,239 | 130 | 427,595 |

| Project Type | Year | Chinook | Coho | Sockeye | Total |
|---------------------|--------------|----------------|--------------|----------------|----------------|
| Commercial Catch | 2003 | 2840 | 530 | | 3,370 |
| | 2002 | 2993 | | | 2,993 |
| | 2000 | 1200 | | | 1,200 |
| | 1999 | 4477 | 40 | | 4,517 |
| | 1998 | 3469 | | | 3,469 |
| | 1997 | 4649 | 626 | | 5,275 |
| | 1996 | 4930 | 668 | | 5,598 |
| | 1995 | 4556 | 811 | | 5,367 |
| | 1994 | 4291 | | | 4,291 |
| | 1993 | 4668 | | | 4,668 |
| | 1992 | 4435 | 170 | | 4,605 |
| | 1991 | 4130 | 350 | 2 | 4,482 |
| | 1990 | 4055 | 407 | | 4,462 |
| | 1989 | 3846 | 841 | | 4,687 |
| | 1988 | 5028 | 1115 | | 6,143 |
| | 1986 | 5040 | 607 | | 5,647 |
| | 1985 | 4804 | 600 | | 5,404 |
| | 1984 | 3842 | 694 | | 4,536 |
| | 1983 | 3336 | 148 | | 3,484 |
| | 1982 | 3017 | 322 | 2 | 3,341 |
| | 1981 | 3791 | | | 3,791 |
| | 1980 | 1794 | | | 1,794 |
| | 1979 | 1663 | | | 1,663 |
| | 1978 | 1426 | | | 1,426 |
| | 1977 | 1125 | | | 1,125 |
| | 1976 | 1533 | | | 1,533 |
| | 1975 | 1349 | | | 1,349 |
| | 1974 | 1389 | | | 1,389 |
| | 1973 | 1642 | | | 1,642 |
| | 1972 | 821 | | | 821 |
| 1971 | 1095 | | | 1,095 | |
| 1970 | 97 | | | 97 | |
| 1969 | 1349 | | | 1,349 | |
| 1968 | 1520 | | | 1,520 | |
| 1967 | 914 | | | 914 | |
| | Total | 101,114 | 7,929 | 4 | 109,047 |

| Project Type | Year | Chinook | Coho | Sockeye | Total |
|-------------------------------|--------------|----------------|--------------|----------------|---------------|
| Escapement (spawning grounds) | 2003 | 1084 | | | 1,084 |
| | 2002 | 705 | 60 | | 765 |
| | 2001 | 1348 | | | 1,348 |
| | 2000 | 795 | 35 | | 830 |
| | 1999 | 1160 | | | 1,160 |
| | 1998 | 492 | 221 | | 713 |
| | 1997 | 1738 | 391 | | 2,129 |
| | 1996 | 1415 | 400 | | 1,815 |
| | 1995 | 2069 | 381 | | 2,450 |
| | 1994 | 1732 | 384 | | 2,116 |
| | 1993 | 1737 | 299 | | 2,036 |
| | 1992 | 1928 | 290 | | 2,218 |
| | 1991 | 1973 | | | 1,973 |
| | 1990 | 4187 | | | 4,187 |
| | 1989 | 1955 | 196 | | 2,151 |
| | 1988 | 3093 | | 9 | 3,102 |
| | 1987 | | 247 | | 247 |
| | 1986 | 216 | 300 | | 516 |
| | 1985 | 2322 | | | 2,322 |
| | 1984 | 2499 | 304 | 40 | 2,843 |
| | 1983 | 762 | | | 762 |
| | 1982 | 1687 | | 1 | 1,688 |
| | 1981 | 3954 | | | 3,954 |
| | 1980 | 872 | | | 872 |
| | 1979 | 471 | | | 471 |
| | 1978 | 200 | | | 200 |
| | 1977 | 116 | | | 116 |
| | 1976 | 168 | | | 168 |
| | 1975 | 298 | | | 298 |
| | 1974 | 4 | | | 4 |
| | 1973 | 125 | | | 125 |
| | 1972 | 604 | | | 604 |
| 1970 | 200 | | | 200 | |
| 1968 | 109 | | | 109 | |
| 1967 | 83 | | | 83 | |
| | Total | 42,101 | 3,508 | 50 | 45,659 |

| Project Type | Year | Chinook | Coho | Sockeye | Total |
|---------------------------------------|--------------|----------------|--------------|----------------|---------------|
| Escapement (tower, weir, sonar, etc.) | 2003 | 3212 | 718 | 9 | 3,939 |
| | 2002 | 2031 | 301 | | 2,332 |
| | 2001 | 2481 | 320 | | 2,801 |
| | 2000 | 1493 | 514 | | 2,007 |
| | 1999 | 1018 | 253 | | 1,271 |
| | 1998 | 1194 | 303 | 4 | 1,501 |
| | 1997 | 1229 | 617 | | 1,846 |
| | 1996 | 984 | 358 | | 1,342 |
| | 1995 | 811 | 480 | | 1,291 |
| | 1994 | 505 | | | 505 |
| | 1991 | 17 | | | 17 |
| | 1990 | 955 | | | 955 |
| | 1989 | 13 | | | 13 |
| | 1988 | 12 | 266 | | 278 |
| | 1986 | 167 | | | 167 |
| | 1985 | 38 | | | 38 |
| | 1984 | 136 | | | 136 |
| | 1983 | 199 | | | 199 |
| | 1982 | 1 | | | 1 |
| | 1977 | 118 | | | 118 |
| 1976 | 52 | | | 52 | |
| | Total | 16,666 | 4,130 | 13 | 20,809 |
| Sport Catch (marine) | 1998 | 56 | | | 56 |
| | 1983 | 61 | | | 61 |
| | 1980 | 1 | | | 1 |
| | Total | 118 | 0 | 0 | 118 |

| Project Type | Year | Chinook | Coho | Sockeye | Total |
|--------------------------|--------------|----------------|-------------|----------------|--------------|
| Subsistence Catch | 2003 | 1046 | | 20 | 1,066 |
| | 2002 | 944 | 151 | | 1,095 |
| | 2001 | 1370 | 22 | | 1,392 |
| | 2000 | 149 | | | 149 |
| | 1999 | 418 | | | 418 |
| | 1998 | 146 | | | 146 |
| | 1995 | 41 | | 1 | 42 |
| | 1994 | 114 | | | 114 |
| | 1993 | 137 | | | 137 |
| | 1992 | 78 | 11 | | 89 |
| | 1991 | 48 | 12 | | 60 |
| | 1990 | 40 | | | 40 |
| | 1989 | 346 | 67 | | 413 |
| | 1988 | 994 | 88 | | 1,082 |
| | 1986 | 892 | | | 892 |
| | 1985 | 263 | | | 263 |
| | 1984 | 371 | | | 371 |
| | 1983 | 67 | 5 | | 72 |
| | 1982 | 110 | 203 | | 313 |
| | 1979 | 173 | | | 173 |
| | 1978 | 154 | | | 154 |
| | 1977 | 247 | | | 247 |
| | 1976 | 83 | | | 83 |
| 1975 | 44 | | | 44 | |
| | Total | 8,275 | 559 | 21 | 8,855 |

| Project Type | Year | Chinook | Coho | Sockeye | Total |
|---------------------|--------------------|----------------|---------------|----------------|----------------|
| Test Fishing | 2003 | 1955 | 573 | | 2,528 |
| | 2002 | 3427 | 512 | 9 | 3,948 |
| | 2001 | 2434 | 775 | | 3,209 |
| | 2000 | 3016 | 747 | | 3,763 |
| | 1999 | 2196 | 500 | 3 | 2,699 |
| | 1998 | 2021 | 769 | | 2,790 |
| | 1997 | 2584 | 565 | | 3,149 |
| | 1996 | 1702 | 1110 | | 2,812 |
| | 1995 | 577 | 599 | | 1,176 |
| | 1994 | 2095 | 972 | | 3,067 |
| | 1993 | 2216 | 625 | | 2,841 |
| | 1992 | 420 | 904 | | 1,324 |
| | 1991 | 570 | 245 | | 815 |
| | 1990 | 652 | 652 | | 1,304 |
| | 1989 | 549 | 436 | | 985 |
| | 1988 | 425 | 628 | | 1,053 |
| | 1987 | 759 | 578 | | 1,337 |
| | 1986 | 13 | 73 | | 86 |
| | 1985 | 520 | 1328 | | 1,848 |
| | 1984 | 569 | 1260 | | 1,829 |
| | 1983 | 805 | 698 | 4 | 1,507 |
| | 1982 | 502 | | | 502 |
| | 1981 | 573 | | | 573 |
| | 1980 | 190 | | | 190 |
| | 1979 | 157 | | | 157 |
| | 1978 | 290 | | | 290 |
| | 1977 | 222 | | | 222 |
| | 1976 | 137 | | | 137 |
| | 1975 | 164 | | | 164 |
| | 1974 | 193 | | | 193 |
| | 1973 | 659 | | | 659 |
| | 1972 | 640 | | | 640 |
| | 1971 | 314 | | | 314 |
| 1970 | 104 | | | 104 | |
| 1969 | 804 | | | 804 | |
| 1968 | 141 | | | 141 | |
| 1967 | 165 | | | 165 | |
| 1966 | 5 | | | 5 | |
| | Total | 34,765 | 14,549 | 16 | 49,330 |
| All Projects | Grand Total | 203,039 | 30,675 | 104 | 233,818 |

| Project Type | Year | Chinook | Coho | Sockeye | Pink | Total |
|---------------------|--------------|----------------|---------------|----------------|--------------|----------------|
| Commercial Catch | 1999 | 1033 | 410 | 1029 | | 2,472 |
| | 1998 | 1620 | 1309 | 2260 | | 5,189 |
| | 1997 | 1246 | 1878 | 2170 | | 5,294 |
| | 1996 | 1035 | 1877 | 1697 | | 4,609 |
| | 1995 | 626 | 680 | 1483 | | 2,789 |
| | 1994 | 430 | 1968 | 830 | | 3,228 |
| | 1993 | 334 | 1150 | 830 | | 2,314 |
| | 1992 | 1626 | 2038 | 1737 | | 5,401 |
| | 1991 | 1348 | 2044 | 1576 | | 4,968 |
| | 1990 | 1048 | 1410 | 1586 | | 4,044 |
| | 1989 | 1112 | 2144 | 1647 | | 4,903 |
| | 1988 | 1879 | 2322 | 2249 | | 6,450 |
| | 1987 | 1450 | 1463 | 1375 | | 4,288 |
| | 1986 | 1112 | 1526 | 1191 | | 3,829 |
| | 1985 | 1888 | 1766 | 1910 | | 5,564 |
| | 1984 | 1861 | 2343 | 1563 | | 5,767 |
| | 1983 | 3663 | 1647 | 1568 | | 6,878 |
| | 1982 | 1311 | 579 | 573 | | 2,463 |
| | 1981 | 2349 | 1079 | 812 | | 4,240 |
| | 1980 | 1174 | 780 | 277 | | 2,231 |
| | 1979 | 733 | | 30 | | 763 |
| | 1978 | 768 | 1141 | 200 | | 2,109 |
| | 1977 | 1605 | 1089 | 453 | | 3,147 |
| | 1976 | 381 | 630 | 270 | | 1,281 |
| | 1975 | 542 | 445 | 285 | | 1,272 |
| | 1974 | 1377 | 899 | 747 | 1 | 3,024 |
| | 1973 | 1138 | 211 | | | 1,349 |
| | 1972 | 1027 | 137 | 56 | | 1,220 |
| | 1971 | 1016 | 310 | | | 1,326 |
| | 1970 | 442 | | 241 | | 683 |
| | 1969 | 308 | 80 | 614 | | 1,002 |
| | 1968 | 898 | 213 | 190 | 1 | 1,302 |
| | 1967 | 1067 | 370 | 22 | | 1,459 |
| 1966 | 537 | 189 | | | 726 | |
| 1965 | 472 | 60 | 119 | | 651 | |
| 1964 | 887 | | 480 | | 1,367 | |
| 1961 | | 61 | | | 61 | |
| | Total | 41,343 | 36,248 | 32,070 | 2 | 109,663 |

| Project Type | Year | Chinook | Coho | Sockeye | Pink | Total |
|---------------------------------------|--------------|----------------|---------------|----------------|--------------|---------------|
| Escapement (spawning grounds) | 1989 | 403 | 65 | 101 | | 569 |
| | 1988 | 102 | | | | 102 |
| | 1987 | 415 | | 462 | | 877 |
| | 1986 | 181 | | | | 181 |
| | 1985 | 663 | | 29 | | 692 |
| | 1984 | 676 | 39 | 391 | | 1,106 |
| | 1983 | 807 | | 20 | | 827 |
| | 1981 | | 458 | | | 458 |
| | 1973 | 11 | | | | 11 |
| | 1967 | | | 10 | | 10 |
| | | Total | 3,258 | 562 | 1,013 | 0 |
| Escapement (tower, weir, sonar, etc.) | 1999 | 426 | 1651 | 921 | | 2,998 |
| | 1998 | 202 | 1051 | 630 | | 1,883 |
| | 1997 | 991 | 584 | 1741 | | 3,316 |
| | 1996 | 885 | 907 | 289 | | 2,081 |
| | 1995 | 690 | 958 | 738 | | 2,386 |
| | 1994 | 1080 | 863 | 377 | 35 | 2,355 |
| | 1993 | 1026 | 930 | 876 | | 2,832 |
| | 1992 | 1811 | 696 | 1076 | | 3,583 |
| | 1991 | 1035 | 1387 | 544 | | 2,966 |
| | 1990 | 409 | 188 | 330 | | 927 |
| | 1989 | 290 | 40 | 149 | | 479 |
| | 1988 | 944 | 944 | 979 | | 2,867 |
| | 1987 | 534 | 682 | 933 | | 2,149 |
| | 1986 | 768 | 372 | 489 | | 1,629 |
| | 1985 | 1287 | 890 | 786 | 2 | 2,965 |
| | 1984 | 1553 | 1367 | 1018 | | 3,938 |
| | 1983 | 501 | 1049 | 117 | | 1,667 |
| | 1982 | 567 | 171 | 6 | | 744 |
| | 1981 | 1106 | 473 | 53 | | 1,632 |
| | 1980 | 40 | 27 | 25 | | 92 |
| | 1979 | 450 | | | | 450 |
| | 1978 | 611 | | 269 | | 880 |
| | 1976 | 409 | | 175 | | 584 |
| 1975 | 27 | | | | 27 | |
| 1972 | 4 | | | | 4 | |
| 1971 | 23 | | | | 23 | |
| 1968 | | | 2 | | 2 | |
| | Total | 17,669 | 15,230 | 12,523 | 37 | 45,459 |

| Project Type | Year | Chinook | Coho | Sockeye | Pink | Total |
|-----------------------------|--------------------|----------------|---------------|----------------|---------------|----------------|
| Sport Catch (freshwater) | 1996 | 35 | | | | 35 |
| | 1985 | 24 | | | | 24 |
| | Total | 59 | 0 | 0 | 0 | 59 |
| Sport Catch (marine) | 1983 | 61 | | | | 61 |
| | Total | 61 | 0 | 0 | 0 | 61 |
| Subsistence Catch | 1995 | 609 | 40 | | | 649 |
| | 1994 | 190 | | | | 190 |
| | 1993 | 574 | | | | 574 |
| | 1992 | 200 | 40 | | | 240 |
| | 1991 | 30 | | | | 30 |
| | 1989 | | 40 | | | 40 |
| | 1988 | | | | 30 | 30 |
| | 1987 | 465 | | | 43 | 508 |
| | 1986 | 251 | | | | 251 |
| | 1980 | | | | 314 | 314 |
| | Total | 2,319 | 120 | 387 | 0 | 2,826 |
| Test Fishing | 1995 | 66 | 165 | 954 | | 1,185 |
| | 1994 | 511 | 1883 | 961 | | 3,355 |
| | 1993 | 111 | | | | 111 |
| | 1983 | 305 | | | | 305 |
| | 1982 | 195 | | | | 195 |
| | 1981 | 190 | | 870 | | 1,060 |
| | 1980 | 740 | 301 | 669 | | 1,710 |
| | 1979 | 310 | | | | 310 |
| | 1978 | 823 | | 211 | | 1,034 |
| | 1977 | | | 108 | | 108 |
| | 1976 | 1056 | | 200 | | 1,256 |
| | 1975 | 676 | 1 | 143 | | 820 |
| | 1974 | 2 | 248 | 297 | | 547 |
| | 1973 | | | 29 | | 29 |
| | 1972 | | | 7 | | 7 |
| | 1971 | | | 41 | | 41 |
| | 1969 | 850 | | | | 850 |
| | 1968 | 13 | | | | 13 |
| | 1967 | | | 43 | | 43 |
| Total | 5,848 | 2,598 | 4,533 | 0 | 12,979 | |
| All Projects | Grand Total | 70,557 | 54,758 | 50,526 | 39 | 175,880 |

| Project Type | Year | Chinook | Coho | Sockeye | Pink | Total |
|---------------------------------------|--------------------|----------------|-------------|----------------|-------------|--------------|
| Commercial Catch | 1988 | | 1 | | | 1 |
| | 1984 | 29 | | | | 29 |
| | 1978 | | | | 90 | 90 |
| | Total | 29 | 1 | 0 | 90 | 120 |
| Escapement (spawning grounds) | 1984 | | | 3 | | 3 |
| | 1981 | 10 | | | | 10 |
| | Total | 10 | 0 | 3 | 0 | 13 |
| Escapement (tower, weir, sonar, etc.) | 1984 | 1 | | | | 1 |
| | Total | 1 | 0 | 0 | 0 | 1 |
| Test Fishing | 1984 | 2 | | 1 | | 3 |
| | 1979 | | | 1 | | 1 |
| | 1978 | 1 | | | | 1 |
| | Total | 3 | 0 | 2 | 0 | 5 |
| All Projects | Grand Total | 43 | 1 | 5 | 90 | 139 |