

**FY2017 Performance Report for
the Cooperative Agreement
between the US Fish and Wildlife Service
and the Idaho Department of Fish and Game**

**Recipient: Idaho Department of Fish and Game
FWS Agreement Number: F16AC00027 Mod1
Reporting Period: October 1, 2016 - September 30, 2017**

Part 1- Spring/Summer Chinook Salmon

Work Element 1- Evaluation of Hatchery Production Programs

Tasks:

1. Summarize and report the Chinook salmon adult return data by age class for all LSRCP hatchery facilities operated by IDFG. This information will either be submitted to the LSRCP office by March 1, 2018 via the LSRCP generated Excel spreadsheet templates. Data will include:

Data for items a-c will be included in the excel spreadsheet submitted to the LSRCP office by March 1, 2018

- a. Yearly summary of Chinook salmon trapping and disposition data for each hatchery facility (reported in the LSRCP spreadsheet).
- b. Harvest estimates from recreational fisheries conducted by IDFG in the Clearwater River, Salmon River and South Fork Salmon River for the current contract year (reported in the Calendar report).
- c. Harvest estimates from non-tribal commercial and recreational, and tribal fisheries conducted downstream of Idaho for the fisheries that occurred two years prior to the current contract year. Data will include escapement estimates from fish recovered at hatchery traps and spawning ground surveys in areas downstream of Idaho (reported in the LSRCP spreadsheet)
- d. Yearly summary of estimated escapement by release group and age at Lower Granite Dam based on PIT tag detections and PBT samples collected at Lower Granite Dam (reported in the Calendar report).

The estimates associated with PIT tag escapement was completed and the estimates are provided in the in-season PIT tag estimation spreadsheets that are posted on the following website

(<https://collaboration.idfg.idaho.gov/InSeason%20Run%20Documents/Forms/AllItems.aspx>). PBT stock composition results will be reported in the 2017 Calendar Year Report.

2. Work with hatchery staffs to facilitate the summarization and reporting of Chinook salmon spawning and rearing data for all LSRCP hatchery facilities operated by IDFG for the current contract year. This information will be submitted to LSRCP office by March 1, 2018 via the LSRCP generated Excel spreadsheet templates. Data will include:

Data for items a-c will be included in the excel spreadsheet submitted to the LSRCP office by March 1, 2018.

- a. Release location, lifestage and number of juveniles released in the current contract year including the number of marks and tags, and size of the fish.
 - b. The estimated survival rate of juvenile Chinook salmon from each release site to Lower Granite Dam.
 - c. Spawning and early rearing data including: prespawn mortality, number of males and females spawned by origin, fecundity, number culled, estimated green egg take, and green-egg to eyed-egg survival rates.
3. Submit **Brood Year 2010 Completion Report** to LSRCP office by October 1 (end of the contract year). This report will include lifestage specific survival components of the specified brood year from adult spawning through the return of all recruits. Specific information provided in this report will include:
 - a. Spawning and broodstock management protocols of parent group including prespawn mortality and fecundity.
 - b. On station survival (green-egg to juvenile release).
 - c. Summary of marking and tagging.
 - d. Number of juveniles released by life stage and location including size of fish released
 - e. Estimated survival from release sites to Lower Granite Dam.
 - f. Cohort reconstruction (returning progeny across three return years).
 1. Harvest in Ocean, Columbia River, Snake River, and terminal fisheries
 2. Returns to hatcheries (including dispositions)
 3. Estimated number of strays
 4. Estimated number of dropouts and unintended escapement.
 - g. Estimated smolt-to-adult survival rates and progeny: parent ratios

The 2010 report is in draft format and will be available in 2018. All of the data used to generate the report is available in the Excel template spreadsheet submitted to LSRCP by March 1, 2018.

Work Element 2- Pre-season and In-season Chinook salmon fisheries management

Tasks:

1. Hatchery Evaluation staff will assist in the development of preseason run forecasts of hatchery-origin Snake River Chinook salmon back to the Columbia River mouth.

Preliminary run reconstruction data for all hatchery-origin returns in 2017 was summarized and submitted to the IDFG Fisheries Bureau to help facilitate development of run forecasts for 2017. PBT analysis for the 2017 LGD return and PIT tag conversion rates were used to complete the 2017 run reconstruction to the Columbia River mouth.

2. Hatchery Evaluation staff will maintain and update daily in-season estimates of adult Chinook salmon at Bonneville, McNary, Ice Harbor and Lower Granite dam. This will help to facilitate weekly inter-agency and tribal teleconferences that are used to manage harvest share, and broodstock management for all hatchery programs in Idaho. In-season escapement estimates will be updated daily (Monday-Friday) during the Chinook migration and posted to a website that is accessible to all interested parties.

In-season spreadsheets were updated daily (Mon-Fri) during the spring/summer Chinook adult migration in 2017. Daily updates were posted to the website and summarized by evaluation staff at each of the weekly teleconference calls.

Work Element 3- Juvenile Mark, tag and release planning and associated data management

Tasks:

1. Organize and convene an annual inter-agency mark/tag committee meeting in October-December to facilitate coordination of marking and tagging activities that will occur the following year (May-Nov).

A coordination meeting was held at the IDFG Nampa Research office on November 28, 2017 to discuss marking/tagging coordination for 2017 as well as the upcoming activities for 2018.

2. Coordinate and submit mark and tag plans for LSRCP Chinook salmon hatcheries operated by IDFG. Mark plans will be distributed to the PSMFC marking crew, hatchery staff and the LSRCP by the end of May of the current contract year for marking and tagging that will occur in the following contract year.

Mark and tag plans were developed and distributed to hatchery and marking staffs. A summary of all marking and tagging that was completed in 2017 will be summarized in the 2017 Idaho Anadromous Fish Marking Program Report produced by PSMFC. The report will be available during the first quarter of 2018 and is available from IDFG.

3. Work with IDFG- hatchery staff to develop loading plans that ensure representation of tags (PIT and CWT) across family groups and rearing containers and to track family units as part of Parental Based Tagging.

M&E staff worked cooperatively with hatchery staffs to develop representative CWT and PIT loading and tagging plans. All plans were distributed to the marking crew and hatchery staffs.

4. Enter, validate, and maintain all marking, tagging and release data in the IDFG database and/or FINS as juvenile rearing and release modules are implemented.

All 2017 marking and tagging data were entered into the IDFG database and are available on request.

5. Manage, validate, and upload, all PIT tag files to the PTAGIS regional database for chinook released in the current contract year

All PIT tag files for migration year 2017 were validated and uploaded to the PTAGIS database. Tagging files for migration year 2018 from the fall 2017 tagging have been uploaded to PTAGIS. After releases are completed in the spring of 2018, all tag files will be re-uploaded with the associated release information.

Work Element 4- Operation of Coded Wire Tag Laboratory

Tasks:

1. Assemble and distribute snout sample bags as necessary to LSRCP hatcheries, harvest monitoring staff, and to IDFG research staff.

This task was completed.

2. Coordinate the delivery of all snouts collected in the current contract year to the CWT laboratory in Nampa.

This task was completed.

3. Excise CW tags, read, enter and validate all CWT information into the IDFG database.

This task was completed.

4. Upload all CWT recovery information into the RMIS database. This data upload will occur on or before December 31 and will include CWTs recovered in Idaho fisheries, spawning ground surveys and hatchery traps during the spring, summer, fall of the current year. Expansion factors for tag recoveries will be uploaded for fall Chinook.

This task will be completed by the end of January, 2018.

Work Element 5- Harvest monitoring for Chinook salmon recreational fisheries conducted in Idaho

IDFG staff is responsible for all recreational harvest monitoring and for the development Chinook salmon catch estimates in the Clearwater River drainage, and sections of mainstem Salmon River and South Fork Salmon River.

Tasks

1. Work with Idaho state fish managers to implement spring/summer and fall Chinook salmon harvest monitoring programs in Idaho where applicable.
2. Conduct harvest surveys for all recreational Chinook salmon fisheries in Idaho.
3. Maintain electronic records of all harvest data.

Recreational fisheries were conducted in sections of the Snake, Clearwater, Salmon rivers in 2017. Harvest monitoring staffs conducted angler creel surveys for all Chinook fisheries and provided harvest estimates. A summary of the estimated number of fish harvested is summarized below. Results of the PBT analysis will be used to partition out the fish to stock and cohort for the mixed stock fisheries and will be included in the 2017 Chinook Calendar Year report that is submitted in 2018.

Estimated Harvest of spring/summer Chinook salmon in Idaho, 2017

River	Estimated Harvest		
	Adults	Jacks	Total
Clearwater River	274	125	399
Lower Salmon River	484	336	820
Little Salmon River	1,113	454	1,567
Upper Salmon River	355	379	734
Snake River	340	89	429
Totals	2,566	1,383	3,949

Work Element 6 – Electronic Database Systems

M&E staff will continue to collaborate with the PSMFC database development team, IDFG Information Systems Bureau staff, Fisheries Bureau staff, and Hatchery O&M staff in a guidance role for the development of a comprehensive relational database to house IDFG LSRCP hatchery information. Data elements will include the accounting of LSRCP hatchery production facilities over the complete life cycle of program fish.

Tasks:

1. Participate in hatchery database committee meetings, trainings for staff, and help steer the database development process.

A representative from the M&E staff is on the Hatchery Database Technical Advisory Committee and attended all committee meetings. While regularly scheduled technical committee no longer occur, M&E staff continue to stay involved in the database development process through impromptu meetings with the development team and a smaller core set of users.

Work Element 7 – ESA Compliance

To implement LSRCP programs, M&E staff will assess hatchery operation and evaluation actions to determine potential effects on species listed under the Endangered Species Act; represent IDFG during formal ESA consultation; coordinate and integrate Idaho's anadromous fish management and research with the assessments or applications for Section 7/10 or Section 4d, subsequent Biological Opinions, Permits and Management Plans, NOAA Fisheries Recovery Plans, USFWS Bull Trout recovery plans and develop and submit Hatchery and Genetic Management Plans (HGMPs) for stocks produced at State of Idaho facilities, or co-managed by the State of Idaho, that are funded by LSRCP.

IDFG will help the USFWS-LSRCP Office ensure that the Section 7 Biological Assessments, Section 10 permit applications, and HGMP documents are coordinated and reflect currently operated programs. Further, IDFG will continue to provide data for ESA concerns to other agencies, and program tasks and objectives will be modified as necessary to minimize adverse impacts to listed species. IDFG will be involved in the USFWS/NOAA Fisheries consultations and USFWS/USFWS consultations for the LSRCP Program under the ESA.

Tasks

1. Assess LSRCP hatchery evaluation actions to determine potential effects on species listed under the Endangered Species Act.
2. Assist USFWS-LSRCP staff with quantitative analysis for the development or modifications of Biological Assessments, Permits and HGMPs.

M&E staff provided data and assisted with development of Biological Assessments for the hatchery programs. Biological Opinions were completed by the end of 2017

3. Assess effects of all proposed actions and estimate direct and indirect takes of listed species using tasks and results listed in this Statement of Work.

This data will be provided as part of the yearly reporting requirements for the Biological Opinions

4. Develop and recommend alternatives to reduce deleterious effects of the LSRCP programs on all listed species.

5. Provide necessary annual reports, evaluations, or “take summaries” to NOAA Fisheries and USFWS Ecological Services to comply with ESA reporting requirements for takes resulting from hatchery operations, evaluation actions and permits. For individual facility take summarization, coordinate annually with Mark Robertson (mark_robertson@fws.gov) on reporting for programs within the LSRCP.

Reporting will be initiated starting with the juvenile releases in 2018.

6. Review special conditions of Section 10 permits and special requirements for Section 7 coverage through HGMPs and coordinate with IDFG personnel who will implement the actions to ensure that all actions are permitted and consistent with permit requirements.
7. Provide IDFG responses to the NOAA Fisheries and USFWS draft and/or final Biological Assessments, Opinions, and Recovery Plans related to implementation of the LSRCP programs in Idaho.

M&E staff provided data and assisted with development of the Proposed Actions, updated HGMPs as necessary for all hatchery programs operated by IDFG. Biological Opinions were completed by the end of 2017

Specific tasks for 2017

1. Work with co-managers and LSRCP in producing revised HGMPs to reflect for implementation of additional spring Chinook salmon production in the Clearwater Basin and at Sawtooth Fish Hatchery for submission to NOAA-Fisheries and USFWS.

The Proposed Actions and ultimately the Biological Opinions were updated to reflect the increased production for these programs.

Part 2- Summer Steelhead

Work Element 1- Evaluation of Hatchery Production Programs

Tasks:

1. Summarize and report the steelhead adult return data by age class for all LSRCP hatchery facilities operated by IDFG. This information will either be submitted to the LSRCP office by December 31 (90 days after the end of the current contract), via the LSRCP generated Excel spreadsheet templates or in the Calendar Year Report submitted in the following fiscal year. Data will include:

Data for items a-c will be included in the excel spreadsheet submitted to the LSRCP office by March 1, 2018

- a. Yearly summary of steelhead trapping and disposition data for each hatchery facility (reported in the LSRCP spreadsheet).
- b. Harvest estimates from recreational fisheries conducted by IDFG in the Snake River, Clearwater River, Little Salmon River, and Salmon River for the current contract year (reported in the Calendar report).
- c. Harvest estimates from non-tribal commercial and recreational, and tribal fisheries conducted downstream of Idaho for the fisheries that occurred two years prior to the current contract year. Data will include escapement estimates from fish recovered at hatchery traps and spawning ground surveys in areas downstream of Idaho (reported in the LSRCP spreadsheet).
- d. Yearly summary of estimated escapement by release group and age at Lower Granite Dam based on PIT tag detections and PBT samples collected at Lower Granite Dam (reported in the Calendar report).

This task associated with PIT tag estimates was completed and provided in the in-season PIT tag estimation spreadsheets that are posted on the following website (<https://collaboration.idfg.idaho.gov/InSeason%20Run%20Documents/Forms/AllItems.aspx>). PBT stock composition estimates will be reported in the 2017 Calendar Year Report.

2. Work with hatchery staffs to facilitate the summarization and reporting of steelhead spawning and rearing data for all LSRCP hatchery facilities operated by IDFG for the current contract year. This information will be submitted to LSRCP office by December 31 (30 days after the end of the current contract), via the LSRCP generated Excel spreadsheet templates. Data will include:
 - a. Release location, lifestage and number of juveniles released in the current contract year including the number of marks and tags, and size of the fish.
 - b. The estimated survival rate of juvenile steelhead from each release site to Lower Granite Dam.

- c. Spawning and early rearing data including: prespawn mortality, number of males and females spawned by origin, fecundity, number culled, estimated green egg take, and green-egg to eyed-egg survival rates.

Data for items a-c will be included in the excel spreadsheet submitted to the LSRCF office by March 1, 2018.

3. Submit Brood Year 2010 Completion Report to LSRCF office by October 1. This report will include lifestage specific survival components of the specified brood year from adult spawning through the return of all recruits. Specific information provided in this report will include:
 - a. Spawning and broodstock management protocols of parent group including prespawn mortality and fecundity.
 - b. On station survival (green-egg to juvenile release).
 - c. Summary of marking and tagging.
 - d. Number of juveniles released by life stage and location including size of fish released
 - e. Estimated survival from release sites to Lower Granite Dam.
 - f. Cohort reconstruction (returning progeny across three return years).
 - i. Harvest in Ocean, Columbia River, Snake River, and terminal fisheries
 - ii. Returns to hatcheries (including dispositions)
 - iii. Estimated number of strays
 - iv. Estimated number of dropouts and unharvested escapement.
 - g. Estimated smolt-to-adult survival rates and progeny: parent ratios

A draft of the BY2010 report is not currently available but all of the data that will be presented in the brood report is in the Excel template spreadsheet that will be submitted by March 1, 2018.

4.

Work Element 2- Pre-season and In-season fisheries management

Task:

1. Hatchery Evaluation staff will maintain and update in-season estimates of adult steelhead at Bonneville, McNary, Ice Harbor and Lower Granite dam that are based on the detections of PIT tagged fish. This will help to facilitate inter-agency and tribal teleconferences that are used to manage harvest share, and broodstock management for all hatchery programs in Idaho.

In-season PIT tag spreadsheets were updated weekly during the steelhead adult migration in 2016/2017. Updates were posted to the website and summarized by evaluation staff at each of the weekly teleconference calls. A summary of the PIT tag estimates at LGD will be provided in the 2017 Calendar Year Report.

Work Element 3- Juvenile Mark, tag and release planning and associated data management

Tasks:

1. Organize and convene an annual inter-agency mark/tag committee meeting in October – December to facilitate coordination of marking and tagging activities that will occur the following year (May-Nov).

A coordination meeting was held at the IDFG Nampa Research office on November 28, 2017 to discuss marking/tagging coordination for 2017 as well as the upcoming activities for 2018.

2. Coordinate and submit mark and tag plans for LSRCP steelhead hatcheries operated by IDFG and Hagerman National Fish Hatchery. Marking and tagging plans will be distributed to hatchery staffs, LSRCP and the PSMFC marking crew around the end of May of the current contract year for marking that will occur in the following contract year.

Mark and tag plans were developed and distributed to hatchery and marking staffs. A summary of all marking and tagging that was completed in 2017 will be summarized in the 2017 Idaho Anadromous Fish Marking Program Report produced by PSMFC. The report will be available during the first quarter of 2018 and is available from IDFG.

3. Work with IDFG-LSRCP hatchery staff to develop loading plans that ensure representation of tags (PIT and CWT) across family groups and rearing containers and to track family units as part of Parental Based Tagging.

M&E staff worked cooperatively with hatchery staffs to develop representative CWT and PIT loading and tagging plans. All plans were distributed to the marking crew and hatchery staffs.

4. Enter, validate, and maintain all marking, tagging and release data in the IDFG database and/or FINS as juvenile rearing and release modules are implemented.

All 2017 marking and tagging data were entered into the IDFG database and are available on request.

5. Manage, validate, and upload, all PIT tag files to the PTAGIS regional database for steelhead released in the current contract year.

All PIT tag files for migration year 2017 were validated and uploaded to the PTAGIS database. Tagging files for migration year 2018 from the fall 2017 tagging have been uploaded to PTAGIS. After releases are completed in the spring of 2018, all tag files will be re-uploaded with the associated release information.

Work Element 4- Operation of Coded Wire Tag Laboratory

Tasks:

1. Assemble and distribute snout sample bags as necessary to LSRCP hatcheries and IDFG research staff.

This task was completed.

2. Coordinate the delivery of all snouts collected in the current contract year to the CWT laboratory in Nampa.

This task was completed.

3. Excise CW tags, read, enter and validate all CWT information into the IDFG database.

This task was completed.

4. Upload all CWT recovery information into the RMIS database. This data upload will occur on or before December 31 and will include CWTs recovered in Idaho by IDFG.

This task will be completed before the end of January, 2018

Work Element 5- Harvest monitoring for steelhead recreational fisheries conducted in Idaho

IDFG staff funded by LSRCP is responsible for all recreational harvest monitoring in the Clearwater River drainage, Snake River, and Salmon River,

Tasks

1. Conduct harvest surveys/cwt/PBT recovery for all recreational steelhead fisheries in Idaho.
2. Maintain electronic records of all harvest data.

The Idaho Statewide steelhead harvest survey for the fall of 2016 and the spring of 2017 has been completed. A summary of harvest by major river section in the Salmon, Clearwater, and Snake rivers for each of the fall and spring fisheries is provided below. Once the PBT analysis from the fishery sample is complete, the Excel spreadsheet template will be updated to reflect the estimated catch from each rearing facility, stock and cohort. Results will also be provided in the 2017 Calendar Year Report.

Drainage	Fall	Spring	Total
Clearwater River	6,980	6,586	13,566
Salmon River	8,166	2,944	11,110
Snake River	3,826	258	4,084
Total	18,972	9,788	28,760

Work Element 6 – Electronic Database Systems

M&E staff will continue to collaborate with the PSMFC database development team, Fisheries Bureau staff, and Hatchery O&M staff in a guidance role for the development of a comprehensive relational database to house IDFG LSRCP hatchery information. Data elements will include the accounting of LSRCP hatchery production facilities over the complete life cycle of program fish.

Tasks:

1. Participate in hatchery database committee meetings, trainings for staff and help steer the database development process.

A representative from the M&E staff is on the Hatchery Database Technical Advisory Committee and attended all committee meetings. While regularly scheduled technical committee no longer occur, M&E staff continue to stay involved in the database development process through impromptu meetings with the development team and a smaller core set of users.

Work Element 7 – ESA Compliance

To implement LSRCP programs, M&E staff will assess hatchery operation and evaluation actions to determine potential effects on species listed under the Endangered Species Act; represent IDFG during formal ESA consultation; coordinate and integrate Idaho's anadromous fish management and research with the assessments or applications for Section 7/10 or Section 4d, subsequent Biological Opinions, Permits and Management Plans, NOAA Fisheries Recovery Plans, USFWS Bull Trout recovery plans and develop and submit Hatchery and Genetic Management Plans (HGMPs) for stocks produced at State of Idaho facilities, or co-managed by the State of Idaho, that are funded by LSRCP.

IDFG will help the USFWS-LSRCP Office ensure that the Section 7 Biological Assessments, Section 10 permit applications, and HGMP documents are coordinated and reflect currently operated programs. Further, IDFG will continue to provide data for ESA concerns to other agencies, and program tasks and objectives will be modified as necessary to minimize adverse impacts to listed species. IDFG will be involved in the USFWS/NOAA Fisheries consultations and USFWS/USFWS consultations for the LSRCP Program under the ESA.

Tasks

1. Assess LSRCP hatchery evaluation actions to determine potential effects on species listed under the Endangered Species Act.
2. Assist USFWS-LSRCP staff with quantitative analysis for the development or modifications of Biological Assessments, Permits and HGMPs.

M&E staff provided data and assisted with development of Biological Assessments for the hatchery programs. Biological Opinions were completed by the end of 2017

3. Assess effects of all proposed actions and estimate direct and indirect takes of listed species using tasks and results listed in this Statement of Work.

This data will be provided as part of the yearly reporting requirements for the Biological Opinions

4. Develop and recommend alternatives to reduce deleterious effects of the LSRCP programs on all listed species.
5. Provide necessary annual reports, evaluations, or “take summaries” to NOAA Fisheries and USFWS Ecological Services to comply with ESA reporting requirements for takes resulting from hatchery operations, evaluation actions and permits. For individual facility take summarization, coordinate annually with Mark Robertson (mark_robertson@fws.gov) on reporting for programs within the LSRCP.

Reporting will be initiated starting with the juvenile releases in 2018.

6. Review special conditions of Section 10 permits and special requirements for Section 7 coverage through HGMPs and coordinate with IDFG personnel who will implement the actions to ensure that all actions are permitted and consistent with permit requirements.
7. Provide IDFG responses to the NOAA Fisheries and USFWS draft and/or final Biological Assessments, Opinions, and Recovery Plans related to implementation of the LSRCP programs in Idaho.

M&E staff provided data and assisted with development of the Proposed Actions, updated HGMPs as necessary for all hatchery programs operated by IDFG. Biological Opinions were completed by the end of 2017

Part 3- PBT Sampling and Analysis for Estimating the Harvest Contribution of Snake River Origin Spring/Summer Chinook Salmon and Summer Steelhead in the Columbia River and Snake River basins

Results from this work will be reported as follows:

For Fiscal Years 2014 through 2016, two summary reports have been developed that account for Zones 1-5, and Zone 6 fisheries sampling (Byrne et al. 2015, 2016) and one is outstanding for the period covering June 2015 to March 2016. That report will be provided in FY 2017. For Snake Basin fisheries analyses, results will be part of pending calendar year reports.

The 2015 report is in draft format and will be available in 2018.

For Fiscal Year 2017, catch contribution based on the recoveries of PBT for the spring/summer Chinook sport fisheries in Idaho occurring during the spring and summer of 2017 and the summer steelhead fisheries occurring during the fall of 2016 and spring of 2017 will be included in the 2017 Calendar Year Report submitted to LSRCP by IDFG.

Results of the PBT based catch composition from steelhead fisheries in the Columbia River and in the Snake River downstream of the ID/WA border during the fall of 2016 and spring of 2017 will be reported in a joint report produced by IDFG, CRITFC, PSMFC, WDFW, and the Yakama Nation in FY2018.

Part 4- Anadromous Hatchery Data Management

1. Data Summarization and Reporting.

- Provide data summaries and technical assistance to IDFG fishery managers in order to facilitate in-season management of Chinook fisheries.
- Assist with developing data summaries and responding to data requests from intra- and inter-agency managers
- Assist with developing and maintaining IDFG web based summaries and reports for hatchery data.

2. Data Management and Compilation

Provide assistance in the development and updating of annual operating plans (AOPs)

- Continue to refine web based data entry for both Clearwater R and Salmon R AOPs.
- Assist managers with updating data tables for Clearwater AOP
- QA/QC for hatchery database- compare queries to annual reports and in-season summaries to verify data are being entered and displayed correctly