U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#09-2013

Project: McNary
Biologists: Carl Dugger and Bobby Johnson
Dates: April 26 – May 2, 2013

Turbine Operation

McNary had 12 units available for power generation this week. On April 1, the hard constraint one percent criteria began. No units ran outside the criteria. Unit outages are recorded in Table 1.

Table 1. Unit Outages at McNary Dam.

Units	Outage Dates	Outage Length	Reason
3	Jun 4, 2012 – Unknown	About one year.	After rewind, thrust bearing.
14	Sep 18 – Unknown	Over seven months.	Turbine bearing issues continue.
8 & 9	May 1	5.0 & 3.2 hours each.	Trash rack cleaning.
9, 10, 11, 12 &13	May 2	0.5, 0.8, 2.0, 0.9 & 0.8 hours each.	Trash rack cleaning.

Adult Fish Passage Facilities

On April 26 and May 1, the McNary fisheries biologists performed measured inspections of the adult fishways. On April 28 and 29, respectively, we did inspections of the Washington and Oregon ladders. When the juvenile facility is in primary bypass, the fisheries staff helped to monitor the picketed leads. Visual fish counts continued.

Fish Ladder Exits: Both ladders met all Fish Passage Plan criteria were during inspections. Picketed leads at exits are being cleaned regularly. At the Washington exit, weir 338 triggered an alarm once this week. Operators restored normal weir operation after resetting the alarm. The amount of debris along the Washington shore continues to fluctuate. The Oregon exit recorded 4 false traveling screen alarms this week. In each case, the operator reset the alarm and restored normal operation. Our traveling screen differential monitoring revealed no problems.

Fishway Entrances and Collection Channel: At the Washington ladder entrance, all inspection points were in criteria. Spill turbulence is causing calibration drifts which are very difficult to correct.

On April 28, the biologist found weir W3's the north cable disconnected. At 1430 hours, the operators removed the weir from automatic operation so it would not become further damaged.

On May 2, after regional discussion and planning, from 1008 to 1820 hours, the ladder was placed in orifice flow so the general maintenance crew could raise and replace both cable rods on W3. This work was completed at 1703 hours. In order to improve conditions for the work, spill bays 1 and 2 were closed with spill being redirected to other bays from 0958 to 1714 hours. Attraction water will be discussed below. Just after 1820 hours, the ladder returned to automatic operation.

At the Oregon ladder entrances, all points appeared to be in criteria. However, at the north power house entrance, the assistant biologist had been noticing slack in the weir cables. At NFEW3, the biologist noted slack four times this year. Each time the weir appeared to be in criteria.

At NFEW2, the biologist noted cable slack approximately six times before this report week. Looking back, the weir may have been out of criteria on approximately four occasions. This week, on April 29 and May 1, the biologist noted slack again. On April 28, the weir may have been in criteria. On May 1, by looking at the chain links, the biologist estimated the weir to be at 7.5 feet.

The project believes the issue is with the stainless steel rollers on the weirs. They appear to be jamming the weir as they roll in the metal guides. The project is discussing with district personnel about replacing the rollers with UHMW plastic ones.

We continue to note calibration drifts at SFEW1 at the south power house entrance. On April 29, the project calibrated the weir. During the work, the dial indicator was removed and the power to the LED readout was off. The biologist checked the weir's depth after the initial inspection. We are monitoring the drift issue and are looking into the possibility of replacing the current sensors with something else.

Oregon ladder collection channel velocities averaged 2.8 feet per second.

Auxiliary Water Supply System: For the report week, the Wasco county PUD turbine unit in the Washington ladder had one interruption in service on May 2 in support of the work on entrance weir, W3, described above. From 0958 to 1740 hours, the project had both the PUD turbine and the associated bypass system out of service.

For the Oregon ladder, fish pumps 1 and 3 operated all week with with 30 degree blade angles and no interruptions in service. Pump 2 remains out of service for major overhaul which will require a contract. The juvenile facility continues to supply the usual 450 cfs to the north powerhouse pool.

Juvenile Fish Passage Facility

The spring season with alternating days of primary and secondary bypass with the switch taking place every morning at 0700 hours continued. No deviations from this schedule occurred. We bypassed 172,082 smolts and 2,000 juvenile lampreys this week.

Forebay Debris/Gatewell Debris/Oil: For the week, forebay debris was light to heavy with most of it being at the powerhouse. Trash rack cleaning, weather, debris infusion and project operations affected debris dispersal.

The highest trash rack differential the fisheries staff measured this week was 1.5 feet at unit 8 for the A slot. On April 30, the project removed 2.8 ten-yard truckloads of debris (28 cubic yards) from the water surface by units 8, 9 and 10. On May 1 and 2, we cleaned racks at units 8 to 14 removing approximately 24 truckloads of debris (240 cubic yards), consisting mostly of tumble weeds. The project plans to continue cleaning trash racks next week. We cleaned unit 14 while it was out of service.

We observed 33 smolt mortalities and retrieved three live juvenile lamprey from the debris. Most of the mortalities were from slot 8A were the debris load was the highest. System data around the late April / early May trash cleaning operations are reflected in Table 2.

Table 2. System Data.

Date	Fish Numbers	Descaling Percentage	Mortality Percentage
Apr 29	62,712	5.5	0.03
May 1	79,060	10.2	0.09
May 3	106,532	3.6	0.03

It appears the trash, especially at unit 8, may have adversely affected the descaling rate.

We noted no problems in the gatewell slots except on April 27 when the ESBS rope had to be removed from the orifice inflow at 5C slot. Also, the fisheries staff removed spillage from the slots after trash rack cleaning.

ESBSs/VBSs: All ESBS are installed except those associated with units 3 and 14 which are out of service. This week the technical staff adjusted all the programable logic circuit controllers (PLCs). The ones at units 6 and 8 were checked twice. On April 26, the screen at slot 2A was switched to timer mode. Since it is a timing operation, the name was changed from bypass mode (ESBSs can be operated in 2 modes, one mode using proximity switches to stop brush movement and reverse direction. The other, "bypass" mode uses a timer to control the brush). On April 28 and 29, the biologist found the brush mechanism on slot 2A's ESBS short cycling. Each time the operators recalibrated the device. "Short cycling" means the cleaning brush reverses direction before the end of the normal travel distance. Camera inspections will begin in mid May. All VBS differentials met criteria this week and none were cleaned.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: For the week, we had 42 orifices open with no problems observed. During trash rack raking operations, we closed the orifices in affected units during the cleaning and opened additional orifices in adjacent units. On April 29, one collection channel water alarm occurred while a technician was cycling orifices. We reviewed protocols to prevent a reoccurrence. All systems operated well in automatic mode. The transition screen cleaning device remains out of service until it can be examined during a channel dewatering. The fisheries staff continued to monitor the channel during primary bypass.

Transportation Facility: During the spring fish passage season, both primary and secondary bypass modes return all fish are to the river. PIT tag detection occurs in the full flow pipe during primary bypass and throughout the facility during secondary bypass. Smolt monitoring continues to occur only on secondary bypass days.

The sample gates are on every other day during secondary bypass operations. The gates functioned well. The primary PIT tag system remains off as the bypass lines provide a better route for the fish than the PIT tag system lines. PSMFC employees performed the weekly test of the PIT system. The secondary PIT/bypass gates remain off and open for bypass season.

We continued to do ice block checks of the return to river lines, even though the bypass outfall is too far away to see the blocks exit the pipe even with binoculars.

This week, a contractor installed new doors for the facility shop.

Transport Summary: No fish transport is taking place at this time.

River Conditions

River conditions during the week are outlined in Table 3 as provided by the smolt monitoring staff (PSMFC). The data day runs from 0700 to 0700 hours.

The spring spill season which calls for 40 percent of river flow being spilled with both TSWs in operation continued. On May 2, the pattern was altered to allow repairs to the Washington ladder entrance weir as described above.

Table 3. River conditions at McNary Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature (^{o}F)		Water Clarity* (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
234.2	208.5	94.1	83.8	54.0	49.3	6.0	6.0

*****Control room data.

Other

Inline Cooling Water Strainers: The project will examine the cooling water strainers again on May 7.

Invasive Species: The next zebra mussel station examination will occur in late May.

Avian Activity: We continue bird counts with each zone being observed once a day usually in the morning. In the forebay, we observed a high count of 10 grebes and 6 gulls with an occasional pelican, cormorant or osprey seen. Also, we noted pelicans and gulls on the rocks by the Washington boat dock.

We noted 2 grebes in the gatewell slots. We removed one with other passing into the collection channel and out of the system.

In tailwater locations, we had high counts of 71 gulls and 20 terns with an occasional cormorant or pelican noted. Most of the birds were in the spill basin. We observed high counts of 25 terns and 25 gulls by the bypass outfall.

Hazing personnel continue to work 7 days a week with 2 shifts covering the daylight hours. Also, lethal take of gulls has been authorized for this year. This week, the fisheries staff adjusted the propane hazing cannons. Finally, the water hazing cannon continued to function well.

Research: The FGE study continues at units 6, 7, 12 and 13. GBT examinations continue. Next week, the Oregon exit traveling screen study will begin.

Project: Ice Harbor
Biologist: Mark Plummer
Dates: April 26 – May 2, 2013

Turbine Operation

Turbine units 1- 4 and 6 are in service. Turbine unit 5 remained out of service due to blade cracks.

Adult Fish Passage Facilities

Fish facility personnel inspected the adult fish ways April 29, April 30, and May 1.

Fish Ladders: The north and south shore adult fish ladder inspection areas (picketed leads, head differentials, fish way exits, and depth over weirs) were within criteria.

Fishway Entrances and Collection Channel (inspection date order): The south shore entrance (SFE) was off sill with a depth of 8.6 feet, off sill with a depth of 8.7 feet, and off sill with a depth of 8.9 feet. The north powerhouse entrance (NFE) was off sill with a depth of 8.8 feet, on sill with a depth of 10.7 feet, and on sill with a depth of 11.3 feet. The north shore entrance (NSE) was on sill with a depth of 7.8 feet, on sill with a depth of 7.8 feet, and on sill with a depth of 7.8 feet. Fishway entrance criterion is 8 feet depth, greater than 8 feet depth, or on sill. All channel/tailwater differentials were in criteria. Channel/tailwater differential criteria are 1 – 2 feet.

Auxiliary Water Supply System: Two of the 3 north shore fish pumps were operated without problems. Six of 8 south fish pumps are in service. All south fish pumps are available for operation.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: No problems to report. Fish ladder exits are clear of debris and the bubblers are operating satisfactorily.

STSs/VBSs: STSs are in operation. No problems were found on the April inspections. May STS/VBS inspections are scheduled for May 21 and 22. Turbine strainer inspections will be conducted at the same time.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: The juvenile bypass is watered up with 20 open orifices.

Juvenile Bypass Facility: No problems to report.

Fish Sampling: The first sample took place April 8. Sampling days alternate from Monday and Wednesday to Tuesday and Thursday each week.

Removable Spillway Weir: The RSW is in operation. Spill in support of fish passage began April 3, 2013.

Fish Sampling:

April 30:

Species	Sampled	#Descaled	Morts	Avian Marks
C-CH	3	0	0	0
UC-CH	7	1	0	0
C-CH-O	---	---	---	---
UC-CH-O	---	---	---	---
C-SH	39	1	0	2
UC-SH	---	---	---	---
C-COHO	---	---	---	---
UC-COHO	---	---	---	---
C-SOCK	---	---	---	---
UC-SOCK	---	---	---	---
TOTAL	49	2	0	2

May 2:

Species	Sampled	#Descaled	Morts	Avian Marks
C-CH	35	2	0	1
UC-CH	38	2	0	1
C-CH-O	---	---	---	---
UC-CH-O	---	---	---	---
C-SH	28	1	0	3
UC-SH	3	0	0	0
C-COHO	---	---	---	0
UC-COHO	---	---	---	---
C-SOCK	---	---	---	---
UC-SOCK	---	---	---	---
TOTAL	104	5	0	5

River Conditions

River conditions during the week are outlined in Table 1.

Table 1. River conditions at Ice Harbor Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature* (^{o}F)		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
66	47	47.9	19.5	50	50	4.9	4.6

*Unit 1 scrollcase temperature.

Other:

Inline Cooling Water Strainers: The next main turbine cooling water strainer inspections are scheduled for May 22 and 23.

Invasive Species: No invasive species were detected this week.

Avian Activity: Formal bird counts began April 8 and are in progress. Hazing activities by APHIS began April 1.

Research: Work on the adult south fish ladder trap continues. Sampling is tentatively scheduled to begin May 6.

Project: Lower Monumental
Biologists: Bill Spurgeon and Elizabeth Lindsey
Dates: April 26 – May 2, 2013

Turbine Operation

The units are being operated within hard constraint 1% operational criteria.

Adult Fish Passage Facility

The adult fishway was inspected by Corps and PSMFC/State biologists on April 26, 27, 28, 30, and May 1 and 2.

Fish Ladders: Fishway exit head differentials and depths over the weirs were within criteria (≤ 0.5' and 1.0'-1.3', respectively) on all inspections. Picketed lead head differentials were in criteria (≤ 0.4' and ≤ 0.3' for north and south shore fishways, respectively) on all inspections.

Fishway Entrances and Collection Channel: NSE1 and NSE 2 weir gates were in depth criteria (criteria: > 8' or on sill) on all inspections. North shore channel/tailwater head was in criteria (1'-2') on all inspections.

SPE 1 and SPE 2 weir gates were in sill criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill, the gate depth readings were 6.0', 6.3', 5.7', 6.7', 6.2', and 6.5 feet. South powerhouse channel/tailwater head was in criteria (1'-2') on all inspections.

SSE1 weir gate was in sill criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill, the gate depth readings were 6.2', 6.0', 6.0', 7.3', 6.8', and 6.5 feet. SSE 2 was in criteria (6' above sill) on all inspections. South shore channel/tailwater head was in criteria (1'-2') on all inspections.

Auxiliary Water Supply System: AWS pumps 1 and 3 were operated throughout this period. Two pump operation will continue until bearing repair and shaft alignment work is completed on pump 2, approximately July 15.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was an average of 13.2 square yards of forebay debris observed during this period. Gatewell debris ranged from 0-10% surface coverage. No oil was observed in gatewells.

STSs/VBSs: STS operation was changed to cycle run mode on April 30 due to no sockeye under 120mm in length occurring in the sample.

Orifices, Collection Channel, Dewatering Structure, Flume: The collection channel is operating with 19 orifices open.

Collection Facility: Collection for condition sampling began on April 1. Subsequent collection for condition monitoring occurs every third day. Collection for transport is scheduled to begin at 0700 hours on May 7.

Transport Summary: No fish transport in progress at this time. The first barge is scheduled to depart on May 8.

River Conditions

River conditions during the week are outlined in Table 1.

Table 1. River conditions at Lower Monumental Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature (^{o}F)*		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
65.6	52.2	31.2	26.0	50.0	49.0	4.4	4.0

*Scrollcase temperatures.

Other

Spring spill operation is occurring.

Inline Cooling Water Strainers: Cooling water strainers were inspected on May 1. No live lamprey were recovered. Mortalities included 5 juvenile lamprey, 16 juvenile salmon, and 3 juvenile steelhead.

Invasive Species: There were no zebra mussels observed at the monitoring stations on April 1.

Avian Activity: Formal bird counts have been in progress since April 1. Bird hazing activities also began April 1.

Research: There is no research is in progress at this time.

Project: Little Goose
Biologists: Richard Weis
Dates: April 26 – May 2, 2013

Turbine Operation

Turbine units 1 through 6 were available for service throughout most of this report period. Unit 4 was forced out of service on April 28 due to an exciter regulator problem. Turbine units were operated within the 1% efficiency criteria.

Adult Fish Passage Facility

USACE and ODFW fisheries biologists performed measured inspections of the adult fishway April 26, 27 and 30.

Fish Ladder: The ladder exit head differentials ranged between 0.0 and 0.1 feet (criteria $\leq$ 0.5 ft.). Water depths over the weirs ranged between 1.1 and 1.2 feet (criteria 1.0-1.3 ft.) and picketed lead head differentials remained steady at 0.0 feet (criteria $\leq$ 0.3 ft.). No debris was observed at the picketed leads or at the ladder exit. The air bubbler used to prevent debris from collecting near the ladder exit operated satisfactorily.

Fishway Entrances and Collection Channel: Channel to tailwater head differentials ranged between 1.5 and 2.3 feet (criteria 1.0 to 2.0 ft.). SSE weir depths ranged between 8.0 and 8.5 feet (criteria $\geq$8.0 ft). As a result of 2 pump operations and decreased channel to head differentials, NPE2 remained closed. NPE1 weir rested on sill and depths ranged between 5.0 feet and 5.6 feet (criteria $\geq$7.0 ft or on sill). NSE weirs are at fixed elevations of 532.0 feet and depths ranged between 5.0 and 5.7 feet (criteria $\geq$ 6.0 ft.). Collection channel surface water velocities (criteria 1.5 fps) measured 1.8 fps for the single reading near the NSE. Surface water velocities at the junction pool were not measureable due to up-welling from diffuser 2 that dominated over lateral laminar flows.

Auxiliary Water Supply System: Fish pumps 1 and 2 operated within criteria ranging between 74 and 77 rpm. Fish pump 3 remains out of service and is undergoing repairs.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: Woody debris observed this week ranged from 300 to 2,500 square feet inside the trash shear boom. Drawdowns measurements were performed on Turbine units 1, 2 and 3 on May 1. All measurements were within proper operating range and indicated no significant buildup of debris on the trashracks, ESBSs or VBSs.

Spillway Weir: The spillway weir operated in the high crest position.

ESBS/VBS: All ESBSs operated within criteria this report period.

Orifices, Collection Channel, Dewatering Structure, Flume: The juvenile collection system was operated throughout this period with 22 to 23 open orifices.

Transportation Facility: The facility switched from primary to secondary bypass operations on April 28 from 0700 hours to 0700 hours the following day to collect a 24 hour sample of fish for condition sampling. Total fish collection estimated was 28,707. All fish were bypassed. The descaling and mortality rate was 0.7% and 0% respectfully. Collection for transport started May 2 at 0700 hours.

Transport Summary: Direct loading operations commenced May 2 at 0700 hours. The first barge will depart Little Goose on May 03.

River Conditions

River conditions during the week are outlined in Table 1.

Table 1. River conditions at Little Goose Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature* (^{o}F)		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
63.7	48.7	19.2	14.4	50.0	47.3	4.7	3.6

*Ladder temperature.

Other

Cooling Water Strainers: On May 1, cooling water strainers were inspected. Recovered mortalities included 5 salmonids and 1 juvenile lamprey. No live fish were found.

Invasive Species: The zebra mussel substrate monitor was inspected on April 7. No mussels were observed.

Avian Activity: The maximum bird count from single survey included 18 cormorants and 53 gulls. USDA-APHIS bird hazing started on April 1 and continued through this report period.

Research: Gas Bubble Trauma research was conducted on May 2. No signs of GBT were observed.

Project: Lower Granite
Biologists: Mike Halter and Ches Brooks
Dates: April 19 - 25, 2013

Turbine Operation

Lower Granite had all turbine units except for unit 6 available for power generation at the beginning of the report period. Turbine unit 6 returned to service on May 2 at 0930 hours after the installation of its final ESBS fish screen.

Adult Fish Passage Facility

On April 26, 27 and 29 the Lower Granite fisheries biologists performed measured inspections of the adult fishway system.

Fish Ladder: All criteria were met.

Fishway Entrances and Collection Channel: Head differential readings remained within criteria at all fishway entrances during the period inspections.

Weir depths at the south shore fishway entrances also met criteria during all weekly inspections. The north powerhouse fishway entrances were on sill during all inspections this week with depths of 5.2– 6.0 feet due to tailwater elevations below 636.0 feet (these gates bottom out at elevations below 636.0 feet). Weir depths at the north shore entrances ranged from 3.2 to 5.2 feet (criterion $\geq$ 7.0 feet). Only north shore entrance 1 can adjust its depth relative to the tailwater elevation. North shore entrance 2 is manually set at a compromise depth of 630.0 feet. Normally, weir depth readings at the north shore entrances are sacrificed in order to maintain the requisite 1.0 foot of head differential.

Velocity readings in the adult fishway collection channel transition pool area ranged from 0.95 to 1.16 feet per second and averaged 1.02 feet per second.

Auxiliary Water Supply System: Fish pumps 1 and 3 were operated during the week. There were no problems.

Juvenile Fish Passage Facility

Sample rates varied between 1% and 2% during the report week. Fish numbers were relatively low during the week and the sample rate was increased to 2% on April 27-30 to accommodate research marking needs.

Forebay Debris/Gatewell Debris/Oil: The amount of forebay debris varied during the week due to wind strength and direction; none was removed.

ESBSs/VBSs: VBS/ESBS video inspections took place on April 19-20. The next video inspections are scheduled for May 17-18.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe: Orifices are being backflushed every 3 hours around the clock in an attempt to keep them free of materials that might impact fish passage.

Transportation Facility: General barge transport operations at Lower Granite began on April 28 with a barge departing every other day. Every day barge transport operations at Lower Granite began on May 2.

Transport Summary: The first daily barge left Lower Granite on May 2. The only research barge of the season (index barging) departed Lower Granite on April 26. Research fish are now being barged along with the general fish collection. Fish barging operations have been going smoothly. Every day fish barging is scheduled to continue through the month of May.

Removable Spillway Weir: Mandatory spill operations began at 0000 hours on April 3. The RSW was operated in support of general spill operations.

River Conditions

River conditions during the week are outlined in Table 1.

Table 1. River conditions at Lower Granite Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature* (^{o}F)		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
63.5	47.8	20.3	20.2	51.8	50.7	5.0	4.8

*Scrollcase temperature.

Other

Video counts in the adult fish ladder counting room began on March 1 and concluded on March 31. Visual counting between the hours of 0400 and 2000 began on April 1.

Inline Cooling Water Strainers: Cooling water strainers were inspected for lamprey entrainment on April 30. A total of 78 lamprey were found in the strainers over a combined run time of 2,007 unit hours. The next cooling water strainer inspections are scheduled for late May.

Invasive Species: The zebra mussel substrate near the adult fishway exit was last examined for zebra mussels on April 1. No evidence of zebra mussels was found. The next inspection is scheduled for early May.

Avian Activity: Formal bird counts and hazing started on April 1.

Adult Fish Trap: The adult fish trap was watered up and sampling began on March 4. The sample rate is now 25%. Since in 2013 adult trapping will only be conducted Monday thru Friday the 25% sample rate represents an overall weekly sample rate of 21%. Genetic samples will be taken from one out of every 10 hatchery steelhead. All wild steelhead captured will be PIT-tagged and scale and genetic samples taken. Any previously PIT-tagged steelhead (either hatchery or wild) will have both scale and genetic samples taken for verification purposes.

Research

Idaho Fish and Game (IDFG) Genetic Stock Identification: The goal of this study is to develop fine-scale genetic profiles for natural origin salmon and steelhead; develop genetic stock identification (GSI) techniques to estimate stock-specific escapement over LGR, monitor abundance, productivity and distribution of naturally produced adult and juvenile steelhead and salmon; research and monitor stock-specific life history characteristics. At LGR the goal of the study will be to enumerate and characterize the natural production of spring/summer Chinook salmon and steelhead above LGR with regards to age composition and genetic stock profiles. IDFG will sample Monday through Friday until the first part of July with the goal to collect between 2,000-5,000 genetic samples each from yearling spring/summer Chinook and steelhead and 500-3,000 genetic samples from subyearling fall Chinook.

Biological Evaluation of Prototype Overflow Weir and 14 inch Orifice: A prototype overflow weir and enlarged 14 inch orifice were installed into intake gatewell 5A during the winter. These structures will be evaluated by UC Davis, Biomark and Blue Leaf Environmental. Biological testing will take place from April 15-June 30; the goal is to release 350 hatchery steelhead and 350 hatchery yearling Chinook into the gatewells six days a week, beginning April 15. When yearling spring/summer fish numbers decline 350 hatchery subyearling Chinook will be collected and released.

Nez Perce Tribe (NPT)/U. of Idaho (UI)/Columbia River Intertribal Fisheries Commission (CRITFC) – Kelt Study: The goal of this research project is to study the physiology and endocrinology of steelhead kelts to evaluate the feasibility and success of several strategies for rehabilitating and handling steelhead collected at LGR. Also, to understand and identify the suite of physiological changes that occurs in Snake River steelhead during the process of sexual maturity, and to determine changes that occur post spawning that are associated with successful downstream migration and recovery to spawn again. As part of this collaborative study to investigate approaches to increase adult steelhead returns the NPT will select up to 150 fish for transport to the Dworshak National Fish Hatchery holding facility.

United States Fish and Wildlife Service (USFWS), United States Geological Service (USGS), Pacific Northwest National Laboratory (PNNL) and National Marine Fisheries Service (NMFS) –Holdover fall Chinook Study: This study is part of the regional discovery based research titled "Investigating passage of ESA-listed fall Chinook salmon at Lower Granite Dam during winter when the fish bypass system is not operated". This is a cooperative study of the survival and prevalence of the reservoir-type life history of juvenile fall Chinook salmon in the Snake River and the passage of subyearlings and reservoir-type fish through the lower Snake River. This part

of the study collects PIT-tagged yearling fall Chinook holdovers in the Sort by Code tanks at LGR from the 2012 release of Dworshak hatchery fish.

National Marine Fisheries Service (NMFS)-Monitoring the Migrations of Wild Snake River Spring/Summer Chinook: This study is done to monitor the migration behavior and survival of wild spring/summer Chinook salmon in the Snake River basin. The specific goals are to characterize the migration timing and estimate parr-to-smolt survival to LGR of different wild Chinook populations as they migrate from their natal rearing areas and determine migration patterns and what environmental factors influence those patterns. Fish were PIT-tagged during the summer of 2012 in natal streams and are diverted to the Sort by Code tanks at LGR.