U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#28-2013

Project: McNary
Biologists: Carl Dugger and Bobby Johnson
Dates: September 6 - 12, 2013

Turbine Operation

McNary had 10 units available for power generation this week. On April 1, the hard constraint one percent criteria began and no units ran outside the criterion this week.
Unit outages are recorded in Table 1.

Table 1. Unit Outages at McNary Dam.

Units	Outage Dates	Outage Length	Reason
4	Jun 24 – Jan 30, 2014	About seven months.	Rewind contract.
11	Jun 28 – Jan 30, 2014	About seven months.	Rewind contract.
3	Jun 4 – Sep 27	About four months.	Turbine bearing issue.
13	Sep 3 – 26	24 days.	Above water overhaul.
7	Sep 10	Eight hours.	Install turbine bearing cooling equipment.
6	Sep 11	Seven hours.	Tap the hub.

Adult Fish Passage Facilities

On September 6, 8 and 11, the McNary fisheries biologists performed measured inspections of the adult fishways. Visual fish and video lamprey counting continues. On September 10, a new heat pump was installed at the Oregon ladder PIT tag station. On September 15, temperature monitoring will conclude.

When the juvenile facility is in primary bypass, the fisheries staff helped to monitor the picketed leads. Twice times this week, the fisheries staff found the Oregon count station differential out of criteria due to milfoil on the leads which the general maintenance staff cleaned in the morning.

Lowering the Oregon ladder entrance weirs, SFEW1, SFEW2, NFEW2 and NFEW3, nightly for adult lamprey passage continues. Monitoring of the weirs has revealed no problems.

Fish Ladders' Exits: The project cleaned the exits' picketed leads regularly including the weekends. Eurasian milfoil continues to be a problem. During the inspections, all Fish Passage Plan criteria were met on both ladders' exits except as described here.

At the Washington exit, on September 11, the head over weir was 0.9 feet. The biologist asked for a set point adjustment.

On September 6 and 8, at the Oregon exit, the head over weir measured 0.8 and 0.9 feet, respectively. The biologist asked for a set point adjustment. On September 11, the count station differential was 0.9 feet. The biologist asked for the picketed leads to be cleaned.

Due to encoder issues, weir 340 remains in manual. The electrical staff cleared the alarm lights for weirs 335 to 339. Our differential monitoring of the traveling screens revealed no problems.

Fishway Entrances and Collection Channel: At the Washington ladder entrance, all inspection points were in criteria. Weir, W2, is operating well with the digital encoder. The LED remains unplugged. Weir, W3, remains in manual until new parts arrive. Once the weir is repaired it will be recalibrated.

At the Oregon ladder entrances, all points were in criteria. At times, north powerhouse entrance, NFEW2, has slight amount of slack in its south cable. This week, no calibration drifts were noted at any of the Oregon entrance weirs. Possibly the end of spill season has improved entrance calibration.

The Oregon ladder's collection channel velocity average 1.3 feet per second from surface readings.

Auxiliary Water Supply System: For the report week, the Wasco county PUD in the Washington ladder had one interruption. The unit was down from September 5 at 1654 to September 6 at 1157 for maintenance issues. During the outage, the bypass system operated well.

For the Oregon ladder, fish pumps 1 and 3 operated all week with blade angles of 30 degrees with no interruptions. Fish 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 season continues with alternating days of primary and secondary bypass with the switch occurring every morning at 0700. No deviations from this schedule occurred. We bypassed 1,520 smolts and 44 juvenile lampreys.

Forebay Debris/Gatewell Debris/Oil: For the week, forebay debris along the powerhouse was very light to light consisting of Eurasian milfoil and wood. Thunderstorms and wind direction effected the debris's distribution.

The fisheries staff found no problems when measuring trash rack differentials. The project did not clean any racks.

We noted no problems in the gatewell slots. On September 8, we remained the ESBS rope at 10A slot from the orifice inflow.

On September 9, the project installed bulkheads at 13A and 13B slots. Later, we dewatered unit 13's gatewell slots so above water maintenance could begin. At 13A slot, an oil leak was noted but this had no ill affect as the slot was dewatered.

ESBSs/VBSs: All ESBS's are installed all units except at unit 11and 13 which are out of service. The screens at 2A, 3A, 7B, 8C and 10C slots remain in timer mode. On September 8, camera inspections at units 2 and 10 revealed no problems. The units were in standby for a dive on the interstate highway's bridge piers.

VBS differential monitoring revealed four screens out of criteria. On September 7 and 10 to 12, the project cleaned these screens and 14 others. When cleaning the VBS's, we observed no juvenile lamprey or smolt mortalities. We only noted juvenile shad lost.

We will use the slots at unit 11 to cycle in rehabilitated VBS's over time.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: For the week, we had 42 orifices open with no problems observed except the ESBS rope mentioned above. We noted no harm to fish. The orifices at unit 13 remain closed with spare orifices at unit 12. For the VBS rehabilitation, we will close orifices unit 11 as needed with spares being opened nearby. Finally, we adjusted the north orifice operator at 1B slot.

All systems operated well in automatic mode. On September 7, at 2130, the side screen cleaning device had a timing alarm. When checked, the roving operator found no problem. Possibly, debris had briefly stalled the device. On September 10, at 0445, the device stalled going upstream. The operator turned it off. At 0645, project maintenance staff returned the device to the parked position. After which, the mechanism functioned properly with no other issues. Again, the device probably stalled on woody debris.

On September 11, the mechanics did scheduled maintenance on the side dewatering valves. The fisheries staffs tightened the liner in the side screen device's electrical cable tray and added a section of liner.

The fisheries staff monitored the channel during VBS cleaning along with primary bypass. We are also checking the channel at midnight on secondary bypass days.

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

We turned the sample gates on and off every other day to be on with secondary. 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 lines. Also, PSMFC preformed the weekly test of the PIT system. The secondary PIT/bypass gates remain off and open for bypass season.

On September 12, we noted the downstream edge of the porosity unit's perforated plate was warping. The fisheries staff flattened the plated, smoothed the area and covered it with silicone. No obvious harm to fish was noted. The project has begun plans to have a contractor rebuild the perforated screens in the coming winter.

Transport Summary: Transport will not occur at McNary this year.

River Conditions

River conditions during the week are outlined in Table 2 as provide the smolt monitoring staff, PSMFC. The data day runs from 0700 to 0700. On September 10, for 13 hours, spill occurred due to flow in excess of powerhouse capacity.

Table 2. 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
128.8	66.9	6.5	0.0	71.4	70.4	6.0	6.0

*****Control room data.

Other

Inline Cooling Water Strainers: On September 10, the cooling water strainer examination revealed only one juvenile lamprey lost. The only other fish observed were juvenile shad.

Invasive Species: The next zebra mussel station examination will be in late September.

Avian Activity: We continue bird counts with each zone being observed once a day usually in the morning. In the forebay area, we observed an occasional cormorant, grebe or osprey. We noted cormorants and gulls on the rocks by the Washington boat dock.

We observed no grebes elsewhere on project.

In the tailwater area, we had high counts of 141 gulls, 16 cormorants and six terns with an occasional pelican observed. Most of the feeding birds were in powerhouse area with others roosting on the navigation lock wing wall. Bird numbers maybe fluctuating with juvenile shad numbers. Also, the birds may have begun outmigration themselves.

We observed high counts of six gulls and four cormorants by the bypass outfall.

On September 9, the pump or motor for the hazing water sprinkler developed a bearing issue. The sprinkler system was removed from service. A new system will be install in early fall. The fisheries staff continues to work with the propane cannons to keep them functioning well. The gull distress calls we installed appear to have very little affect on the birds.

Research: The adult lamprey passage study continues.

Project: Ice Harbor
Biologist: Mark Plummer
Dates: September 6 - 12, 2013

Turbine Operation

Turbine units 1, 2, and 4 were available for operation the entire reporting period. Turbine unit 3 returned to service September 12 at 1335 hours. Turbine unit 5 returned to service September 9 at 0934 hours. Turbine unit 6 went out of service September 9 at 1038 hours for annual maintenance.

Adult Fish Passage Facilities

Fish facility personnel inspected the adult fish ways September 9, 11, and 12.

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: The center fish way weir 2 remains out of service. The south adult fish pumps will need to be shut down to remove the bulkhead in front of the weir. This will be accomplished during the winter maintenance period. Currently, center fish way weir 1 is being operated. Fish way entrance criterion is 8 feet depth, greater than 8 feet depth, or on sill. All fish way entrances were within criteria on sill or greater than 8 feet of depth. All channel/tail water differentials were in criteria. Channel/tail water 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 were operated without problems. All are available for operation.

Juvenile Fish Passage Facility

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

STSs/VBSs: STSs are in cycle run operation. STS/VBS inspection were performed August 20 and 22. No problems to report. Turbine strainer inspections were done at this time, results are listed below. September inspections are scheduled for 23 and 25.

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: Juvenile fish sampling began April 8 and concluded on July 15.

Removable Spillway Weir: The RSW is not in operation. Spill for fish began April 3, 2013 and ended August 31 at 2359 hours.

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
23.7	18.3	0.0	0.0	70	69	8.2	8.0

*Unit 1 scrollcase temperature.

Other

Inline Cooling Water Strainers: Results of the main turbine cooling water inspections for August are outlined below.

Date	Unit	Number of Lamprey Recovered
20-Aug	6	zero
20-Aug	5	Un-watered for blade repair (not inspected).
20-Aug	4	Zero
20-Aug	3	zero
22-Aug	2	1 Juvenile Lamprey Mortality
22-Aug	1	Zero

Invasive Species: No new 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. Fish facility personnel are conducting bird observations when possible.

Research: No on-site researchers are present at this time.

Project: Lower Monumental
Biologists: Bill Spurgeon and Elizabeth Holdren
Dates: September 6 - 12, 2013

Turbine Operation

The units are being operated in hard constraint of the 1% operation criteria. Unit 2 was taken out of service for annual maintenance at 0800 hours on September 9. Units were rotated out of service on September 10 and 11 for STS inspections.

Adult Fish Passage Facility

The adult fishway was inspected by Corps and PSMFC/State biologists on September 6, 7, 8, 9, and 11.

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 7.3', 6.6', 7.0', 7.5', and 7.0 feet. South powerhouse channel/tailwater head was in criteria (1'-2') on all inspections.

SSE1 weir gate was in depth criteria (criteria: ≥ 8' or on sill) on all inspections. 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 September 30.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was an average of 8.0 square yards of forebay debris observed during this period. Gatewell debris ranged from 0-15% surface coverage. No oil was observed in gatewells.

STSs/VBSs: STS's are operating in cycle mode. STS's were inspected on September 10 and 11. All screens passed inspection.

Orifices, Collection Channel, Dewatering Structure, Flume: The collection channel is operating with 18 orifices open.

Collection Facility: The facility is alternating between primary bypass on even numbered days and collection for transport on odd numbered days.

Transport Summary: Alternate day transport is occurring with trucks departing on odd numbered days.

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
25.0	20.2	0.0	0.0	70.5	68.0	5.0+	4.6

*Scrollcase temperatures.

Other

Spill for fish passage ended at 0000 hours on September 1.

Inline Cooling Water Strainers: Cooling water strainers were inspected on September 11. One live lamprey was recovered. Mortalities included 5 juvenile lamprey, 1 juvenile salmon, 2 juvenile catfish, 16 Siberian prawns, and 1 unknown juvenile species.

Invasive Species: No zebra mussels were observed at the monitoring stations on September 1.

Avian Activity: Bird hazing has ceased for the season.

Research: No researchers are present on site at this time.

Fish Salvage: Unit #2 scrollcase was dewatered on September 11. Fish salvage removed one clipped steelhead mort and one juvenile lamprey mort.

Project: Little Goose
Biologists: George Melanson and Richard Weis
Dates: September 6 - 12, 2013

Turbine Operation

Turbine units 5 and 6 were available for most of this report period. Main Transformer 1 (T1) doble testing was performed September 9 - 13. T1 and turbine units 1 – 4 were removed from service September 9 at 0510 hours and returned to service September 13 at 1618 hours. Main Transformer 2 (T2) was also removed from service on September 9 in support of T1 disconnects and to perform maintenance inspections. T2 and turbine units 5 and 6 were removed from service September 9 from 0510 to 1541 hours. Turbine units were operated within the 1% criteria.

Adult Fish Passage Facility

USACE and ODFW fisheries biologists performed measured inspections of the adult fishway on September 7, 10 and 12.

Fish Ladder: The ladder exit head differentials ranged between 0 and 0.2 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 feet (criteria $\leq$ 0.3 ft.). No debris was observed at the picketed leads or 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 1.4 and 2.2 feet (criteria 1.3 to 2.0 ft.). SSE weir depths ranged between 8.3 and 8.5 feet (criteria $\geq$8.0 ft). NPE weirs ranged between 7.0 and 7.7 feet (criteria $\geq$7.0 ft or on sill). NSE weirs are at fixed elevations of 532.0 feet and depths ranged between 7.0 and 7.4 feet (criteria $\geq$ 6.0 ft.). Collection channel surface water velocity measured near NPE ranged between 2.0 and 2.6 (criteria $\geq$1.5 fps). Collection channel subsurface water velocity was measured on September 10 using the Rickly Hydrologic Current Meter. Three measurements were conducted from near surface, mid depth and near bottom. The subsurface velocity average was 3.2 fps with 3 fish pumps operating and all weirs in open positions.

Auxiliary Water Supply System: All Fish pumps operated within criteria ranging between 72 and 78 rpm. On September 9 fish pumps were increased in rpm to improve adult fish guidance during the turbine unit outages. On September 10 from 0930 to 0950 fish pump 3 was forced out of service to change bearing oil. Pumps 1 and 2 were increased in RPM for the outage. All pumps were then returned to 75 rpm.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: Woody debris gradually increased to approximately 800 square feet in the immediate forebay area. Gatewells for the most part, remained clear of debris. Trash racks were cleaned on unit 6 on September 12. No debris was found.

Spillway Weir: Spill for summer fish season ended on September 1.

ESBS/VBS: All ESBS operated within criteria this report period. All brushes operated as designed. Drawdown inspections were performed on units 5A thru 6C on September 10. Units were in criteria.

Orifices, Collection Channel, Dewatering Structure, and Flume: The juvenile collection system was operated throughout this period with 21 open orifices.

Transportation Facility: The facility continued collection for transport. The facility switched back to 100% sample rate on September 9 at 0700 hours. Daily fish collection for the week ranged between 402 and 1,949 and totaled 6,800. The descaling and mortality rate was 0.9% and 1.5% respectively. Fish with columnaris disease continued to increase and 20 juvenile chinook were bypassed this report period with severe infection. The facility operated on backup power, diesel generator from September 9 to 13 in support of doble testing. No problems were encountered.

Transport Summary: Lower Granite transported Little Goose fish on September 7 and 9 using the 3,500 gallon fish transport trailer in response to increased fish collection. Fish numbers decreased on September 9-11 and the project transported fish in the midi-tank September 11. On September 12 daily trucking started as fish numbers again increased and exceeded every-other-day midi-tank transport capacity. In addition holding conditions beyond 24 hours increased the risk of mortality due to warm water temperatures and fish exhibiting columnaris disease. Fish continued to be transported below Bonneville Dam to the Smolt Monitoring Facility and released to the river via the outfall flume. A total of 6,679 fish were transported. All loading and transport operations were completed satisfactorily.

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
23.2	19.2	8.0	0	71.1	69.5	6.0+	4.3

*Ladder temperature.

Other

Cooling Water Strainers: Cooling water strainers on all units were checked on September 11. No fish were found.

Invasive Species: The zebra mussel substrate monitor was last inspected on September 2. No mussels were observed. The next inspection is scheduled for October 2.

Avian Activity: Maximum bird counted from single survey included 21 cormorants, 33 gulls and 2 Caspian terns.

Research: UC Davis is performing underwater video monitoring of the new lamprey orifices in the adult fish ladder. University of Idaho is performing Adult Salmon Passage Studies using radio telemetry.

Project: Lower Granite
Biologists: Mike Halter and Ches Brooks
Dates: September 6 - 12, 2013

Turbine Operation

Lower Granite had turbine units #2, 3, 4 and 5 available for power generation at the beginning of the report period. Turbine unit #6 was removed from service on June 24 for cavitation repair, followed by annual maintenance. The expected return to service date is December 7. Turbine unit #1 was removed from service on September 3 hours for annual maintenance. The expected return to service date is now September 13.
Special unit operations to improve adult passage continued with the project equally splitting the powerhouse flow between turbine units #2 and #3 from 0400 through 0930 hours or until the daily line outage begins for roof repair work. The goal of this operation is to provide improved passage conditions for adult Fall Chinook during hours of peak passage. Roof repair requires a powerhouse outage from approximately 0930 to approximately 2100 hours Monday thru Saturday. The expected completion date for roof repairs is now September 19. During this outage turbine unit #5 is run at speed no-load (5 kcfs) for station keeping.

Adult Fish Passage Facility

On September 6, 7 and 8 COE fish biologists conducted 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 met criteria during all weekly inspections with depths ranging from 8.0 to 8.4 feet (criterion $\geq$ 8.0 feet). Weir depths at the north powerhouse fishway entrances also met criteria during all weekly inspections with depths ranging from 8.3 to 8.5 feet (criterion $\geq$ 8.0 feet). Weir depths at the north shore entrances ranged from 4.7 to 6.8 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 0.87 to 1.00 feet per second and averaged 0.93 feet per second.

Auxiliary Water Supply System: Fish pumps one and three were run during the week without any problems. Fish pump two is now in standby mode.

Juvenile Fish Passage Facility

The sample rate was increased from 50% to 100% at 0700 hours on September 10 because of a decrease in smolt collection.

Forebay Debris/Gatewell Debris/Oil: Due to concerns over elevated descaling rates the trash racks associated with turbine units #1, #3, and #4 were raked on September 10. Some light debris was removed with the highest concentration being found in front of gatewell slot 4B. Turbine units #2 and #5 were raked on August 27.

ESBSs/VBSs: VBS/ESBS video inspections last took place on August 23. No issues of note were reported. The next inspections are planned for late September.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe: Orifices are being backflushed every three hours around the clock in an attempt to keep them free of materials that might impact fish passage. Debris levels were very light during the report week.

Transportation Facility: The JFF operated smoothly during the week. There were no operational problems of any kind with fish collection, fish sampling, or fish transportation equipment. Fish collection numbers at Lower Granite increased during the week with an average daily collection of smolts of 877 (versus a daily average of 691 last week). Of note is for the last four days of the report week the daily collection of smolts averaged only 375.

Transport Summary: Every other day fish barging operations concluded on August 16. All fish barges have been returned to Lower Granite and are docked for maintenance work and winter storage. Fish trucking operations began on August 18 using the pickup midi-tanker. Collected fish numbers had been relatively low and within the capacity of this transport vehicle. Due to an increase in smolt collection here and at Little Goose it was necessary to use the semi tractor – trailer on the mornings of September 5, 7 and 9 to transport the fish from Lower Granite and Little Goose. On September 11 fish numbers had dropped to within the capacity of the midi-tanker and each project transported their own fish.

Removable Spillway Weir: Mandatory summer spill operations ended at 0001 hours on September 1. At 1600 hours on August 23 the project was directed to close the RSW and operate the spillways in accordance with Table LWG -11 of the FPP. The goal of this operation is to increase fish passage at the adult ladder. On September 9 the spill pattern was modified so that during the hours of roof repairs (approximately 1030 – 1700 hours) only spillways 6 thru 8 will be utilized. This was done to reduce the amount of mist that is adversely impacting roof repairs.

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
25.0	19.7	7.7	2.8	65.3	65.1	5.0+	4.5

*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 last inspected for lamprey entrainment on August 27. A total of 0 lamprey were found in the strainers over a combined run time of 394.9 unit hours. The next cooling water strainer inspections are scheduled for late September.

Invasive Species: The zebra mussel substrate near the adult fishway exit was examined for zebra mussels on September 6. No evidence of zebra mussels was found. The next inspection will take place in early October.

Avian Activity: Formal bird counts and hazing started on April 1. Avian hazing activities concluded for the season on June 30.

Adult Fish Trap: The NOAA adult ladder fish trap did not operate during the week due to low water supply during auxiliary pump operations.

There are three auxiliary pumps that draw water from elevation 705 feet (about 30 feet down); these pumps were designed to supply water to the fish ladder during the reservoir drawdown test in 1992. Emergency auxiliary pumps #1 and #2 were run for the duration of the report week to supply cooler water to the fish ladder.