U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#27-2013

Project: McNary
Biologists: Carl Dugger and Bobby Johnson
Dates: August 30 – September 5, 2013

Turbine Operation

McNary had 9 to 11 units available for power generation this week. The hard constraint one percent criteria has been in effect since April 1. 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.
2	Aug 26 – 30	Five days.	Annual maintenance.
13	Sep 3 – 26	24 days.	Replace current transformer & above water overhaul.
14	Sep 3 – 5	Three days.	Removed from service for unit 13 maintenance. Packing replaced.

Adult Fish Passage Facilities

On August 30, September 1 and 3, the McNary fisheries biologists performed measured inspections of the adult fishways. Visual fish and video lamprey counts continued as did temperature monitoring efforts. Project personnel continue to clean the picketed leads at both exits regularly, especially when the juvenile fish facility is operating in primary bypass mode. Three times this week at night, technicians found the Oregon count station differential out of criteria due to milfoil on the leads. In each case, the general maintenance staff cleaned the leads upon morning arrival. The nightly lowering of Oregon ladder entrance weirs (SFEW1, SFEW2, NFEW2 and NFEW3) in support of adult lamprey passage continued. Monitoring of the weirs revealed no problems.

Fish Ladder Exits: Project personnel cleaned the picketed leads at both exits regularly. Eurasian milfoil continues to be a problem. During the inspections, both ladder exits met all Fish Passage Plan criteria. Weirs at the Washington exit triggered an alarm once this week on September 1. Normal function resumed after the operators reset the alarms. At the Oregon exit, our differential monitoring of the traveling screens revealed no problems. Due to encoder issues, weir 340 remains in manual operation. Following last week's maintenance, weirs 335 to 339 all

had encoder alarms which the operators reset. Despite these resets, the control panel alarm lights would not clear. Electricians are examining this issue.

Fishway Entrances and Collection Channel: All inspection points at the Washington ladder entrance met in criteria. Weir, W2, is operating well with the digital encoder even though the LED remains unplugged. Weir W3 is still experiencing calibration drifts even though the spill season has ended. On September 1, the biologist found W3 constantly moving again. Operators switched the weir to manual operation where it will remain until the electrical staff can resolve the problem. This week, electricians installed the rehabilitated motor at W1. The project will rotate out the weir motors over time, having all of them eventually rehabilitated.

At the Oregon ladder entrances, all points were in criteria except on August 30 when the north powerhouse pool differential measured 0.9 feet. As in previous incidences, the tailwater elevation was low. On September 3, project staff conducted scheduled maintenance at the north powerhouse entrances. NFEW2's south cable continues to have a slight amount of slack at times. The south entrance weir, SFEW2, was occasionally out of calibration this week. Project Maintenance staff will continue to examine all weir issues. Oregon ladders collection channel velocities averaged 1.1 feet per second. All velocity measurements were taken from surface readings.

Auxiliary Water Supply System: For the report week, the Wasco County PUD turbine in the Washington ladder had three interruptions in service. On September 3 and 5, the unit was out of service for switching related to turbine units 13 and 14 for 22 and 45 minutes, respectively. The unit was also out of service from September 5 at 1654 hours to September 6 at 1157 hours. This outage became necessary after the PUD turbine unit encoutered issues following the restart.

Oregon ladder fish pumps 1 and 3 operated all week satisfactorily with blade angles of 30 degrees with no interruptions in service. 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 hours. No deviations from this schedule occurred. We bypassed 1,593 smolts and 108 juvenile lamprey.

Forebay Debris/Gatewell Debris/Oil: For the week, forebay debris along the powerhouse and spillway was very light to light consisting of Eurasian milfoil and wood. Following spill closure, changing winds related to thunderstorms dissipated the debris. On September 5, a tornado warning was issued for Umatilla County.

The fisheries staff found trash rack differential measurements satisfactory and no racks were raked. We noted no unusual problems in the gatewell slots. However some man-made debris were removed when observed.

Slots associated with turbine unit 13 were to be unwatered this week in support of scheduled unit maintenance. This work has been postponed until next week as the bulkheads returned from the offsite contractor with loose bolts. Project personnel needed to tighten these bolts before installation could begin. On September 5, project personnel dip-netted gatewell slots 13A – 13C. Juvenile shad were the only fish recovered. One bulkhead was installed in slot 13C the same day. The remaining bulkheads will be installed on September 9.

ESBSs/VBSs: ESBSs are deployed in all units except in units 11 and 13 which are out of service. The screens in slots 2A, 3A, 7B, 8C and 10C remain in timer mode. ESBSs associated with turbine unit 13 were removed and "dogged off" (stored out of the water) in the unit 14 gatewell slots. Although no ESBS camera inspections occurred this week, fisheries staff did find a proper o-ring and sealed the video camera cable. This repair will allow inspections to resume next week. A new camera is being manufactured by a contractor at this time.

VBS differential monitoring revealed no screens out of criteria. However, with spill closure and thunderstorms, debris loads did increase. On August 30, September 1, 4 and 5, project personnel cleaned 14 screens as a preventative measure. During VBS cleaning operations, no juvenile lamprey, smolt or juvenile shad mortalities were observed. We will use slots in unit 11 to cycle in rehabilitated VBSs over time.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: For the week, we had 42 orifices open with no problems observed. On September 5, we closed the orifices in unit 13 in anticipation of the gatewell slots being dewateried during the course of bulkhead installations. Spare orifices were opened in unit 12. During VBS rehabilitations, we will close orifices in unit 11 as needed with spares being opened nearby.

All systems operated well in automatic mode. On August 30, the rectangular screen cleaning device stalled when traveling downstream. The biologists used the controls to finish the cycle, reset the mechanism and ran the device again. The cleaner likely stalled on debris. We observed no other problems.

The fisheries staff monitored the channel during VBS cleaning operations, during spill closure and during primary bypass operations. The collection channel is also being checked at at midnight on secondary bypass days.

Transportation Facility: 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 operations and throughout the facility during secondary bypass operations. Smolt monitoring occurs only during secondary bypass days. Sample gates are turned on and off as need daily to insure that sample gates function only during secondary bypass operations. The primary PIT tag system remains off as the bypass lines provide a better route for the fish than the PIT lines. PSMFC personnel performed the weekly test of the PIT system as usual. The secondary PIT/bypass gates remain off and open for the bypass season. PSMFC preformed the weekly test of the PIT system as usual.

Juvenile shad and adult salmonid numbers have increased at the separator with the end of routine spill. Debris loads have also increased. After switching to primary bypass operations on September 2, we removed a debris blockage from the B-side separator exit. Fish did not appear to be harmed.

Transport Summary: Fish are not being transported at McNary this season.

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. The summer spill season and PSMFC temperature monitoring efforts ceased by September 1.

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
142.6	86.8	71.3	0.0	71.9	70.4	6.0	6.0

*****Control room data.

Other

Inline Cooling Water Strainers: The next cooling water strainer examination will occur on September 10.

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 a high count of 18 grebes with an occasional gull (or group of gulls), osprey, blue heron or cormorant. We also noted a few gulls on the rocks by the Washington boat dock. We observed no grebes elsewhere on project.

On September 4, we missed the count in the tailwater area. We had high counts of 15 gulls and 24 cormorants with an occasional tern, blue heron, osprey or pelican being observed. Most of the feeding birds were in the spill basin until spill closure at which time they moved to the powerhouse. Birds still roost on the navigation lock wing wall. Bird numbers maybe fluctuating with juvenile shad numbers. Bird outmigration may have also begun. We observed an occasional cormorant or tern by the bypass outfall.

The fisheries staff continues to work with the propane and water hazing cannons to keep them functioning well. This week, we installed a gull distress call to test its effectiveness.

Research: The adult lamprey passage study continues. GBT examinations concluded August 30.

Project: Ice Harbor
Biologist: Mark Plummer
Dates: August 30 – September 5, 2013

Turbine Operation

Turbine units 1, 2, 4, and 6 were available for operation. Turbine units 3 and 5 remained out of service. Turbine unit 3 went out of service August 26 at 0740 hours for annual maintenance. Turbine unit 5 remained out of service due to blade crack repairs.

Adult Fish Passage Facilities

Fish facility personnel inspected the adult fish ways September 3, 4, and 5.

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. The south fish ladder picketed leads require frequent cleaning due to aquatic vegetation fouling.

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 allow bulkhead removal 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 with less 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

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

STSs/VBSs: STSs are in cycle run mode operation. STS/VBS inspection were performed August 20 and 22. No problems to report. Turbine strainer inspections were conducted 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. One clipped adult steelhead mortality was found on the juvenile collection channel walkway September 3 in the vicinity of turbine unit 6. This fish appears to have jumped at the orifice flow and became stranded on the grating.

Juvenile Bypass Facility: No problems to report.

Fish Sampling: The first sample took place April 8 and the last sample was performed 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
21.9	10.1	11.9	0.0	70	69	7.0	6.9

*Unit 1 scrollcase temperature.

Other

Inline Cooling Water Strainers: Results of the main turbine cooling water inspections for August are listed in Table 2 below:

Table 2. Cooling Water Inspection Results, 20 August 2013, Ice Harbor Dam.

Date	Unit	Results
20-Aug	6	None
20-Aug	5	Not inspected – unwatered for blade repair.
20-Aug	4	None
20-Aug	3	None.
20-Aug	2	1 juvenile lamprey mortality
20-Aug	1	None.

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. The fish facility is 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: August 30 – September 5, 2013

Turbine Operation

The units are being operated in hard constraint of the 1% operation criteria. Unit 3 was out of service from 0800 hours on August 12 to 1554 hours on September 4 for annual maintenance. Unit 1 was out of service from 1557 to 2105 hours on August 30 due to a blown actuator tank lower seal on the entry hatch. Unit 3 was out of service from 0720 to 1018 hours on September 5 for operating gate cylinder removal.

Adult Fish Passage Facility

The adult fishway was inspected by Corps and PSMFC/State biologists on August 30, 31, and September 1, 4, and 5.

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 or sill criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill the gate depth readings were 7.9 feet. 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 5.0', 4.9', 5.5', 7.2', and 7.5 feet. South powerhouse channel/tailwater head was in criteria (1'-2') on all inspections.

SSE1 weir gate was in depth or sill criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill the gate depth readings were 6.0', 5.8', and 6.6 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 September 30.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was an average of 2.0 square yards of forebay debris observed during this period. Gatewell debris ranged from 0-10% surface coverage. No oil was observed in the gatewells.

STSs/VBSs: STSs are operating in cycle run mode.

Orifices, Collection Channel, Dewatering Structure, Flume: The collection channel is operating with 18-20 orifices open.

Collection Facility: On August 30 the facility mortality rate was 34.32% (93 mortalities out of 271 fish collected) and there was a sample columnaris rate of 25.4% (29 infected out of 114 sampled). Facility operation was changed to primary bypass with condition sampling on every third day at 1335 hours on August 30 due to these high fish mortality rates. Smolts being held in the sample holding tanks were bypassed to the river at that time.

Fish collected for condition sampling on September 2 had 0.0% mortality with no signs of columnaris. Collection resumed on an alternating day basis, at 0955 hours on September 4 with transport on the end of the collecting day. 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 (in September).

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
20.7	12.3	7.2	0.0	71.0	69.0	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 August 6. No live lamprey were recovered. Mortalities recovered included 1 juvenile lamprey and 2 juvenile catfish.

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.

Project: Little Goose
Biologist: Richard Weis
Dates: August 30 – September 5, 2013

Turbine Operation

Turbine units 1 through 6 were available for all of this report period. 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 3 and 5.

Fish Ladder: The ladder exit head differentials remained steady at 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 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 feet and 2.1 feet (criteria 1.3 to 2.0 ft.). SSE weir depths ranged between 8.3 feet (sill) and 9.7 feet (criteria $\geq$8.0 ft). NPE weirs ranged between 6.5 feet (sill) and 7.6 feet (criteria $\geq$7.0 ft or on sill). NSE weirs are at fixed elevations of 532.0 feet and depths ranged between 6.9 feet and 7.8 feet (criteria $\geq$ 6.0 ft.). Collection channel surface water velocity measured near NPE was 2.2 fps for both readings (criteria $\geq$1.5 fps). Collection channel subsurface water velocity was measured on August 5 using the Rickly Hydrologic Current Meter. Three measurements were conducted from near surface, mid depth and near bottom. The subsurface velocity average was 3.1 fps with 2 pumps operating and NPE 2 raised and closed.

Auxiliary Water Supply System: All fish pumps operated within criteria ranging between 72 and 74 rpm.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: Minimum operating pool elevations ended this report period and as a result, woody debris gradually increased to approximately 500 square feet in the immediate forebay area. Gatewells for the most part, remained clear of debris.

Spillway Weir: The spillway weir was removed from service on August 1. Spill for the summer fish season ended on September 1.

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

Orifices, Collection Channel, Dewatering Structure, and Flume: The juvenile collection system was operated throughout this period with 21 to 23 open orifices.

Transportation Facility: The facility continued collection for transport. Daily fish collection for the week ranged between 271 and 1,686 and totaled 5,410. The descaling and mortality rate was 0.4% and 1.0% respectively.

Transport Summary: Every-other-day trucking operations continue. Lower Granite, using the 3,500 gallon fish transport trailer hauled Little Goose fish on September 5 in response to increased fish collection. Fish are being transported to below Bonneville Dam and released at the Smolt Monitoring Facility outfall pipe. A total of 5,890 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
20.6	12.8	7.5	0.0	72.6	69.2	6.0	5.4

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers were checked on September 5. 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: The maximum number of bird counted from a single survey included 27 cormorants and 24 gulls.

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: August 30 – September 5, 2013

Turbine Operation

Lower Granite had turbine units 1, 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 at 0713 hours for annual maintenance. The expected return to service date is September 27.

Special unit operations for adult passage began again on September 5 with the project directed to equally split the powerhouse flow between turbine units 2 and 3 from 0400 hours 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 hours to approximately 2230 hours Monday thru Saturday for the next 2 to 3 weeks. During this outage turbine unit 5 is run at speed no-load (5 kcfs) to maintain station service.

Adult Fish Passage Facility

On August 31, September 1, 2 and 4 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 also met criteria during all weekly inspections with depths ranging from 8.0 to 8.1 feet. The north powerhouse fishway entrances were on sill during the first 3 inspections this week with depths ranging from 5.9 feet to 7.6 feet due to tailwater elevations below 636.0 feet (these gates bottom out at elevations below 636.0 feet), but was in depth criteria on the September 4 inspection with depths of 8.2 feet (criterion $\geq$ 8.0 feet). Weir depths at the north shore entrances ranged from 3.8 to 6.6 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 0.79 to 1.11 feet per second and averaged 0.94 feet per second.

Auxiliary Water Supply System: Fish pumps1 and 3 were run during the week without any problems. Fish pump 2 is now in standby mode.

Juvenile Fish Passage Facility

The sample rate was lowered from 100% to 50% at 0700 hours on September 5 because of a fairly significant increase in smolt collection.

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 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 3 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 691 (versus a daily average of 279 last week).

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 mounted midi-tank. Collected fish numbers had been relatively low and well within the capacity of this transport vehicle. Due to an increase in smolt collection here and at Little Goose it became necessary to use the semi tractor – trailer on the morning of September 5 to transport the fish from Lower Granite and Little Goose.

Removable Spillway Weir: Mandatory summer spill operations began at 0001 hours on June 21. 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 until the end of mandated spill on September 1. The goal of this operation is to increase fish passage at the adult ladder.

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
22.6	17.4	12.3	0.0	65.9	64.9	4.7	4.1

*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 last examined for zebra mussels on August 2. No evidence of zebra mussels was found. The next inspection will take place in early September.

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 operated adult ladder fish trap did not function during the week due to low water supply during auxiliary pump operations. There are 3 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. Auxiliary pumps 1 and 2 were run for the duration of the report week.