# 2024 ANNUAL FISHWAY STATUS REPORT

# THE DALLES DAM

The Dalles fisheries;

Eric Grosvenor, Jeff Randall, Jim Day, Aaron Young

Operations Project Manager; Ron Twiner

# INTRODUCTION

The Dalles Dam has specific requirements for Columbia River fish passage included in the annual Fish Passage Plan. The Dalles Dam has two fish ladders for upstream adult fish passage, as well as an ice trash sluiceway and spillway used for juvenile fish and downstream steelhead kelt passage. The following document is a summary of all fish passage system operation that occurred at The Dalles Dam in 2024 In addition Northern Wasco Co PUD owns and operates a small turbine that supplies auxiliary water to the north fishway, which has a complete juvenile bypass system. Information on this system can be acquired through Pacific States Marine Fish Commission weekly and annual monitoring reports. The following are dates fish passage systems were in service during 2024

***East Adult Fishway – In service 1/12/ thru 11/29***

***North Adult Fishway – OOS 2/10-2/28***

***Ice/Trash Sluiceway – Open for fish passage 3/1/2 thru 12/15/2***

***Spillway - Open for fish passage 4/10/2 thru 8/31/2***

## FISHWAY DEWATERING PROCEDURES

Dewatering fishways allows for maintenance and inspection. Exit bulkheads are installed and the ladder is allowed to drain. Dewatering pumps used to drain fishways below tailwater elevation. Fisheries personnel enter these areas trapped fish upon water levels required to allow for safe entry. Fish are pushed toward tailwater or captured. Captured fish are transported to forebay or tailwater, depending on location, fish species, age class and stress levels. Efforts are made to provide continual water supply during the entire operation to reduce fish stranding and stress. Fishway areas that cannot be dewatered are inspected by ROV underwater camera.

## Dewatering Fish Salvage Results

Navlock Dewatering -No fish
North Fish ladder -1 juvenile chinook, 2 juvenile steelhead, and 15 lamprey released to river
North Fish ladder entrance - not dewatered
East Fish ladder -1 juvenile and 1 adult chinook, and 1 adult lamprey released to river.
East Lower Channels- 176 lamprey and 71 sturgeon released to river

## MAINTENANCE ACCOMPLISHMENTS AND PLANS

-East exit weirs 156 and 157 lamprey orifices (1.5”x12”) cut into bottom of weirs per PDT direction
-Planning removal of JP2 and JP4 weirs and gearboxes due to lack of need. Investigating need for JP6
-North fishway rock wall reinforcement repair awaiting budget approval.
-Annual vegetation removal north fish ladder postponed. Possible contractor
-West and south entrance weir motors replaced
-East entrance gearbox seal repaired
-East entrance grating repaired following midseason dive repair.
-Count station brush system repaired
-Weir 158 seal repaired
-Finish SCADA output to fisheries office

# Historical Overview of Fishway Modifications

1985 – East fishladder count station and weir modified
1985 – North fishladder exit and weir modified
1990 – N Wasco PUD turbine installed for generation from attraction flow
1997 – North AWS plunge pool rock reinforcement mining straps
1997 – South and north unused side entrances poured concrete wall
2000 – Occlusion plates installed on sluicegates FU1-MU3 (failed passage improvement)
2000 – Fishway automation PLC installed
2000 – Sluiceway surface collector tested
2000 –Closure of all powerhouse floating orifice gates
2001 –Grating replacement north fishway entrance
2002 – spillway vortex suppression device tested
2000 – East Fishway Dewatering Improvements (added pumps, new dewater bulkheads, new entrance weirs)
2003 – J frame modification to occlusion plates (failed passage improvement again, removed several years later)
2005 – Entrance weir extensions to prevent continued cable failures
2006 – Spillway 1-9 new wire ropes and gearboxes
2007 – Spill wall 7/8
2010 – Spill wall 8/9
2010/11 – Grating replacement east fishway Junction pool, east entrance, west entrance, south entrance
2010 – Count stations pickets raised 1.5" (lamprey improvement)
2012 – East exit weir 159 weir rehabilitation
2012 – Floor ramps for lamprey installed in floor of 2 east ladder weir steps
2013 – East exit weir 158 replaced with 2 leaf design
2014 – Floor plating over grating for lamprey improvement installed in orifices of lower east ladder weirs
2015 – East fishway Auxiliary Water System backup system
2017 – East ladder exit FCQ7 power supply replacement
2017 – Entrance weir rounded caps for lamprey improvement
2019 – East exit derelict guides plated for lamprey improvement
2020/23 – Fishway automation PLC and level sensor replacement
2022/23 /24– Exit weir 154-157 lamprey orifices added and passage LPS installed east ladder junction pool

# Inspection Discussion

The following inspection results show a relative steady state for most fishway areas in 2024.

Of note, the PUD intake experienced a large amount of milfoil buildup this past summer, leading to a heightened percentage of "out of criteria" differentials, at 13.8%. The Wasco County PUD and The Dalles Dam staff plan to install a debris boom to help combat this issue.

| Inspection Criteria Comparison Chart | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2024 | | 2023 | | 2022 | | 2021 | |
| **The Dalles Dam** | **Total #** | **%** | **Total #** | **%** | **Total #** | **%** | **Total #** | **%** |
| Number of inspections | 640 | 100% | 636 | 100% | 641 | 100% | 691 | 100% |
| **NORTH FISHWAY** | **out of criteria** | | | | | | | |
| Exit differential | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Count station differential | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Weir crest depth | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Entrance differential | 2 | 0.3% | 1 | 0.2% | 0 | 0.0% | 0 | 0.0% |
| Entrance weir N1 | 0 | 0.0% | 2 | 0.3% | 0 | 0.0% | 0 | 0.0% |
| Entrance weir N2 | NA | NA | NA | NA | 0 | 0.0% | 0 | 0.0% |
| PUD Intake differential | 88 | 13.8% | 10 | 1.6% | 31 | 4.8% | 100 | 14.0% |
| **EAST FISHWAY** | **out of criteria** | | | | | | | |
| Exit differential | NA | NA | NA | NA | NA | NA | 1 | 0.1% |
| Removable weirs 154-157 | 0 | 0.0% | 6 | 0.9% | 2 | 0.3% | 9 | 1.3% |
| Weir 158-159 differential | 0 | 0.0% | 0 | 0.0% | 15 | 2.3% | 16 | 2.3% |
| Count station differential | 1 | 0.2% | 1 | 0.2% | 38 | 5.9% | 0 | 0.0% |
| Weir crest depth | 0 | 0.0% | 0 | 0.0% | 17 | 2.7% | 10 | 1.4% |
| Junction pool weir JP6 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| East entrance differential | 1 | 0.2% | 7 | 1.1% | 8 | 1.2% | 6 | 0.8% |
| Entrance weir E1 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Entrance weir E2 | 5 | 0.8% | 27 | 4.2% | 7 | 1.1% | 18 | 2.6% |
| Entrance weir E3 | 5 | 0.8% | 17 | 2.7% | 5 | 0.7% | 14 | 2.0% |
| Collection channel velocity | 0 | 0.0% | 2 | 0.3% | 16 | 2.4% | 2 | 0.3% |
| West entrance differential | 1 | 0.2% | 5 | 0.8% | 0 | 0.0% | 10 | 1.5% |
| Entrance weir W1 | 1 | 0.2% | 25 | 3.9% | 5 | 0.8% | 12 | 1.7% |
| Entrance weir W2 | 1 | 0.2% | 50 | 7.9% | 2 | 0.3% | 10 | 1.5% |
| Entrance weir W3 | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| South entrance differential | 0 | 0.0% | 5 | 0.8% | 9 | 1.4% | 8 | 1.1% |
| Entrance weir S1 | 1 | 0.2% | 14 | 2.2% | 17 | 2.6% | 20 | 3.0% |
| Entrance weir S2 | 1 | 0.2% | 24 | 3.8% | 26 | 4.0% | 22 | 3.1% |
| **JUVENILE PASSAGE** | **out of criteria** | | | | | | | |
| Sluicegate operation | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Turbine trashrack drawdown | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Spill volume | NA | NA | NA | NA | NA | NA | NA | NA |
| Spill Pattern | NA | NA | NA | NA | NA | NA | NA | NA |
| Turbine Unit Priority | NA | NA | NA | NA | NA | NA | NA | NA |
| Turbine 1% Efficiency | NA | NA | NA | NA | NA | NA | NA | NA |

## Gatewell/Intake Trash Rack Debris Monitoring

Gatewell drawdowns are a measurement of water level differential among the forebay and gatewells. This measurement is used to determine turbine intake trashrack debris loads. As in previous years, all maintained well within the criteria limit of +/- 1.5'. The Dalles Lock and Dam is unique to other dams in that gatewell drawdown measurements have usually not been found out of criteria, nor has gatewell debris been a problem. However, the Fish Passage Plan requires that we periodically check for drawdown. While measuring these drawdowns, gatewells are also checked for fish mortalities. For the 2024 passage season, one juvenile salmonid mortality and one adult lamprey mortality were discovered.

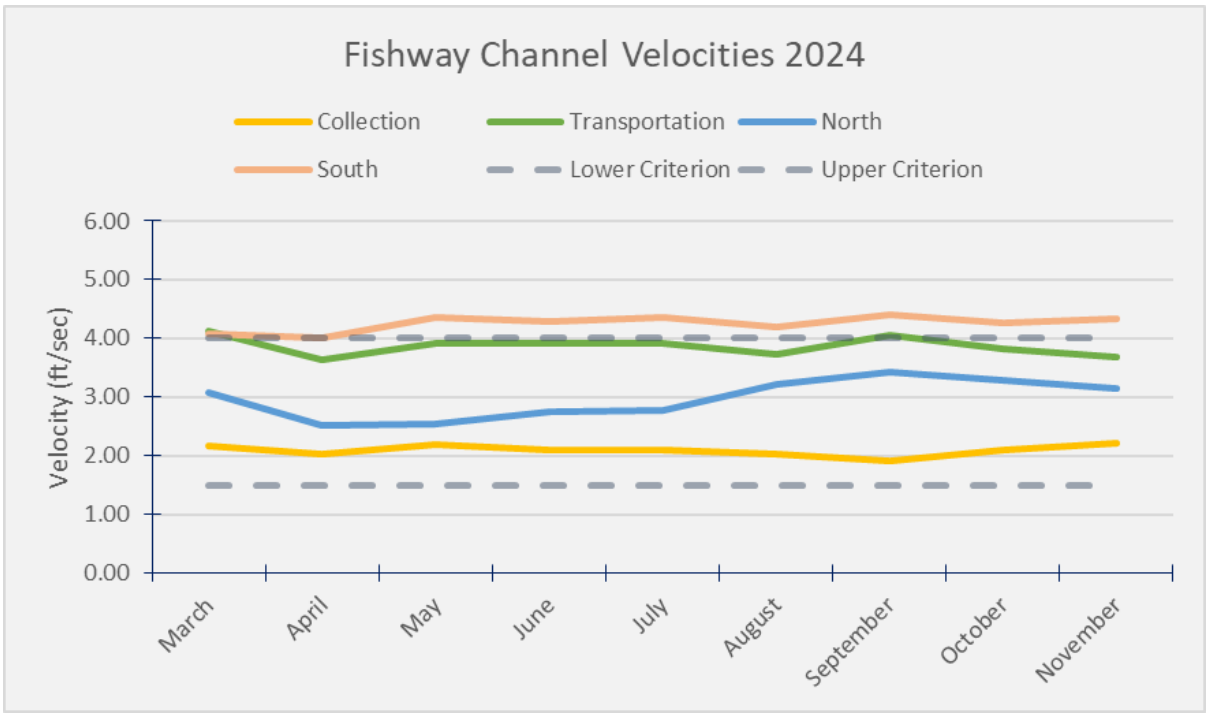
Gatewell orifices are being permanently closed due to the absence of screens and conservation of water. This is done as units become available and workload allows.

In addition, intake trashracks are ROV checked twice yearly per Fish Passage Plan for debris accumulation.

## Water Velocity

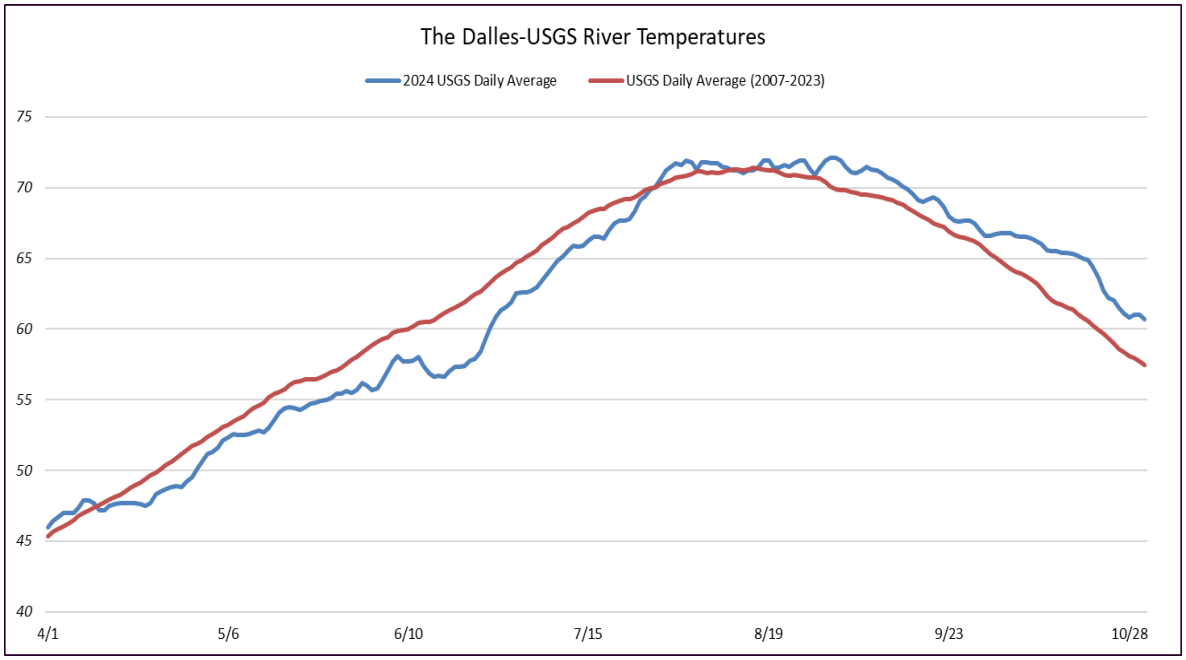
Fishway channel water velocities were measured weekly during the adult fish passage season (March 1 – November 30). The following visual displays averaged weekly velocities from each month for our several fishway channels. Most fall within the flow criteria of 1.5 fps – 4 fps (feet per second).

Notably, the South Channel was generally at or slightly above 4 fps (upper criterion), while the remaining channels were within the ideal range over the duration of the season. These slight deviations from the criteria have not affected fish passage.



# WATER QUALITY

Temperature monitoring with data loggers in each fishway is provided weekly in the fishway status reports. Additional monitoring will be done to determine differences from upper to lower ladder as analyzed by FPC. Stillwell's will be added to west and south entrances. Readings are taken immediately upstream of the count stations and the lower entrance area of each ladder. Refer to link using The Dalles as destination. The Dalles River/Water Temperatures




# Calibration

Calibration checks on fishways were completed weekly at The Dalles Dam to ensure the accuracy of digital readings (derived from mathematical programming for the movable weirs; VEGA sensors for channels/tailrace) and staff gauges. These calibrations involve comparing the digital readings and staff gauges against a handheld laser distance meter.

Maintenance is notified when the laser calibration measurements are out of criteria for several consecutive weeks. Out of criteria means the laser measurement is different from the digital display or staff gauge measurement by more than + or - 0.3'. Those calibrations out of criteria for a likely maintenance issue are shown highlighted in yellow. At times, human error can contribute to an OOC calibration. These are also marked in yellow highlight but did not require service because the calibration was not out of criteria for consecutive weeks, or the calibration was just slightly OOC.

Additionally, environmental conditions (high tailwater, wind, spill, etc.), can lead to an out of criteria calibration. Out of criteria calibrations affected by these conditions are shown highlighted in blue. Those below shown in blue are from the North ladder entrance tailwater and were likely caused by spill slop.

The 2024 season had 75 out of criteria calibrations. Prior seasons OOC totals include: 2023 = 70, 2022 = 94, 2021 = 58

While some calibrations were marginally OOC, the entrances/exits and water levels remained well within the normal operating range throughout the season.

| The Dalles | 1/11 | 1/23 | 2/17 | 3/9 | 3/20 | 3/30 | 4/18 | 4/24 | 5/2 | 5/20 | 5/27 | 6/3 | 6/12 | 6/21 | 7/12 | 8/2 | 8/22 | 9/12 | 9/16 | 10/4 | 10/9 | 10/16 | 10/26 | 11/13 | 11/25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E1 no criteria | NA | NA | 0.5 | 0.7 | 0.6 | 0.6 | 0.6 | 0.7 | 0.7 | 0.6 | 0.9 | 0.6 | -0.7 | 0.6 | 0.6 | 0.7 | 0.7 | 0.6 | 0.6 | 0.5 | 0.6 | 0.5 | 0.6 | 0.6 | 0.5 |
| E2 | NA | NA | 0.6 | 0.6 | 0.6 | 0.3 | 0.3 | 0.7 | 0.6 | 0.2 | 0.8 | 0.6 | 0.6 | 0.6 | 0.3 | 0.5 | 0.6 | 0.3 | 0.5 | 0.5 | 0.5 | 0.4 | 0.3 | 0.4 | -0.2 |
| E3 | NA | NA | 0.3 | 0.2 | 0.3 | 0.1 | 0.1 | 0.4 | 0.1 | 0.2 | 0.5 | 0.4 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 | 0.0 | 0.0 |
| W1 | NA | NA | -0.2 | -0.5 | -0.4 | -0.1 | 0.3 | -0.5 | -0.5 | -0.3 | -0.4 | -0.5 | -0.4 | -0.4 | -0.3 | -0.5 | -0.5 | -0.3 | -0.5 | -0.5 | -0.4 | -0.6 | -0.3 | -0.5 | -0.4 |
| W2 | NA | NA | -0.2 | -0.3 | -0.3 | -0.3 | 0.3 | -0.2 | -0.4 | -0.3 | -0.1 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.3 | -0.4 | -0.4 | -0.5 | -0.4 | -0.4 | -0.6 |
| W3 closed | NA | NA | -0.8 | -0.8 | -0.7 | -0.7 | -0.6 | -0.7 | -0.8 | -0.8 | -0.7 | -0.8 | -0.9 | -0.8 | -0.7 | -0.7 | -0.8 | -0.8 | -0.8 | -0.9 | -0.7 | -0.9 | -0.8 | -0.8 | -0.9 |
| S1 | NA | NA | 0.1 | -0.1 | -0.1 | -0.1 | 0.0 | 0.2 | 0.4 | 0.0 | -0.4 | 0.0 | -0.2 | -0.3 | 0.2 | 0.2 | 0.1 | 0.4 | -0.1 | 0.0 | -0.1 | 0.0 | 0.0 | 0.0 | 0.1 |
| S2 | NA | NA | 0.0 | 0.0 | 0.1 | -0.1 | 0.2 | 0.3 | 0.2 | 0.2 | -0.1 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.4 | 0.2 | 0.0 | 0.2 | 0.2 | 0.2 | 0.0 | 0.2 |
| N1 | 0.1 | 0.2 | NA | 0.1 | 0.3 | 0.2 | 0.3 | 0.2 | 0.4 | 0.2 | 0.5 | 0.2 | -0.5 | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| 159 | NA | NA | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | -0.1 | 0.0 | 0.0 | 0.0 | -0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| 158 | NA | NA | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | 0.2 | -0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 |
| E Chan | NA | NA | -0.4 | -0.2 | -0.2 | -0.2 | 0.1 | -0.2 | -0.3 | -0.1 | 0.1 | -0.2 | 0.0 | -0.2 | -0.2 | -0.1 | -0.4 | -0.3 | -0.2 | -0.3 | -0.2 | -0.2 | -0.2 | -0.4 | -0.3 |
| E TW | NA | NA | 0.0 | -0.3 | 0.0 | 0.1 | 0.2 | -0.2 | -0.1 | 0.1 | -0.1 | 0.0 | -0.1 | -0.1 | 0.2 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.0 | -0.3 | -0.3 |
| W Chan | NA | NA | -0.1 | -0.2 | 0.0 | -0.2 | 0.2 | -0.2 | -0.1 | 0.0 | -0.1 | -0.1 | -0.2 | -0.1 | -0.2 | -0.1 | -0.1 | -0.1 | -0.2 | -0.2 | -0.1 | 0.0 | 0.0 | -0.1 | -0.1 |
| W TW | NA | NA | 0.0 | 0.0 | -0.1 | -0.2 | 0.0 | -0.1 | 0.1 | 0.1 | -0.1 | -0.2 | -0.1 | -0.1 | 0.0 | -0.1 | 0.0 | 0.0 | -0.2 | -0.1 | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 |
| S Chan | NA | NA | -0.4 | -0.3 | -0.3 | -0.3 | 0.1 | -0.2 | -0.3 | -0.2 | -0.1 | -0.2 | -0.3 | -0.4 | -0.3 | -0.2 | -0.2 | -0.3 | -0.2 | -0.2 | -0.2 | -0.2 | -0.1 | -0.3 | -0.3 |
| S TW | NA | NA | -0.4 | -0.5 | -0.4 | -0.3 | -0.1 | -0.2 | -0.5 | -0.4 | -0.6 | -0.1 | -0.5 | -0.3 | -0.2 | -0.3 | -0.5 | -0.4 | -0.3 | -0.3 | -0.4 | -0.3 | -0.2 | -0.3 | -0.4 |
| N Chan | -0.2 | -0.2 | NA | -0.2 | 0.3 | 0.3 | -0.1 | -0.2 | -0.2 | -0.4 | 0.0 | -0.2 | -0.3 | -0.1 | -0.3 | -0.2 | -0.3 | 0.6 | 0.5 | 0.7 | 0.7 | -0.1 | -0.1 | 0.1 | 0.0 |
| N TW | 0.0 | 0.0 | NA | 0.0 | 0.1 | 0.2 | 0.4 | 0.1 | 0.2 | 0.0 | 0.1 | -0.2 | -0.2 | 0.3 | 0.0 | 0.1 | -0.4 | 0.3 | 0.4 | 0.3 | 0.4 | 0.3 | 0.3 | 0.3 | -0.3 |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| E FB | NA | NA | 0.0 | 0.0 | -0.1 | 0.1 | 0.0 | -0.1 | 0.1 | 0.2 | 0.2 | -0.1 | -0.1 | 0.0 | 0.0 | -0.1 | -0.1 | 0.1 | 0.0 | 0.0 | -0.1 | -0.2 | -0.1 | 0.0 | 0.0 |
| N FB | 0.1 | 0.0 | NA | 0.0 | 0.1 | 0.0 | 0.0 | -0.1 | 0.2 | 0.1 | 0.2 | 0.0 | -0.1 | -0.1 | 0.1 | 0.0 | 0.1 | 0.1 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 |

## AVIAN PREDATION

The three main piscivorous birds observed at The Dalles during juvenile salmonid migration are California gulls (CAGU), double crested cormorants (DCCO) and American white pelicans (AWPE). General increases were seen since ~2000, until increased abatement from falconry in 2022 began to reverse this trend.

## USDA HAZING

The United States Department of Agriculture (USDA) was contracted again to provide avian hazing abatement by boat via pyrotechnics and lethal take for gulls and cormorants when conditions permitted. Generally, pyrotechnic hazing by boat occurred in the first half of the day (8hrs) 7 days a week, and lethal take began in SW4 after 930AM.

USDA staff performed avian counts in all zones once a day prior to hazing (~7am -9am) and after hazing in early afternoons. Few counts were performed during hazing, though reductions in gulls foraging were noticeable during pyrotechnics and lethal take, gulls continued to return after take. USDA and USACE staff alternated between AM/PM counts each week. USDA did not target pelicans due to increasing evidence pelicans do not target salmon and displace gulls. USDA hazers concentrated deterrents in zones upstream and downstream of the US-197 bridge, with brief periods when staff shortage, weather and vessel breakdowns limited hazing efforts. In general no afternoon/evening USDA hazing is possible due to high wind/wave conditions at TD. Displacement of gulls to evening feeding can potentially be addressed with falconry abatement.

## FALCONS

Due to expectation that USDA would be performing lethal take in SW4, falconry abatement was limited to 20 days of coverage in 2024 and to focus on pre-nesting DCCO to avoid spacial conflict with lethal take. Contractor Sky Guardian began targeting DCCO in late April 2024, to deter them from nesting on BPA towers at the north Navlock guidewall. All days were dedicated to the towers, including falconry, trained dog, and other audio deterrents used at the base of towers during daylight hours.

These techniques were successful in deterring DCCO from the towers. USDA staff also made regular visits to the base of the towers on foot with pyrotechnics. These combined techniques generally caused birds to abandon the towers for up to 12 hours. Abatement efforts continued through May. In early June it was apparent that DCCO nesting had again been reduced by roughly half to about 15 active nests. Observers noted that the towers several miles downstream near Murdock, WA were now occupied for nesting. PIT tag recoveries in 2024 at these DCCO nesting sites indicate significant continued salmon predation. Two trials with a great horned owl were performed on DCCO on BPA towers at TD and on the PH superstructure at JD with very promising results at deterring them in near dark conditions.

| Year | Number peak nests TD BPA Towers, ODFW Waterbird DCCO Database |
|---|---|
| 2018 | 20 Prior to falconry abatement. |
| 2019 | 25 Prior to falconry abatement. |
| 2020 | 35 Prior to falconry abatement. |
| 2021 | 65 Prior to falconry abatement. |
| 2022 | 65 Prior to falconry abatement. |
| 2023 | 32 With 15 days falconry abatement. |
| 2024 | 15 With 20 days falconry abatement. |

## GULL AND CORMORANT LETHAL TAKE

USDA staff performed lethal take of gulls in SW4 in late April after deployment of all other deterrents proved ineffective. All specimens were collected and prepared according to USFWS permit for eDNA stomach removal according to protocols provided by Yakama Nation staff and Cramer Fish Science. 18 DCCO were also taken to deter predation and collected.

USACE staff took basic morphometric data from all birds, scanned for PIT tags and extracted stomachs from some and preserved whole remains for effigy deterrence work by FFU, at TD and by USDA. Examinations showed that a large percentage of gulls were immature and males were roughly 2 two times more likely to be taken than females. All stomachs were transferred to Cramer Fish Science staff and early results showed very usable data. The Yakama Nation had their own permit to take gulls on the Klickitat river and at Miller Rocks colony. They supplied birds to USACE who dissected samples and provided them to Cramer Fish Sciences.

| | CAGU Taken JD/TD | DCCO Taken JD/TD | RBGU Taken JD/TD | Other Take | Total Take Numbers a | | Stomach Sampled as of 8/28/24 | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | includes ALL stomach samples (JI | | |
| JD PH3 | 45 | 2 | 2 | 0 | 49 | | Y | 318 | |
| TD SW4 | 333 | 16 | 8 | 1 | 358 | | N | 151 | |
| Totals | 378 | 18 | 10 | 1 | 407 | | Not yet sa | 0 | |
| | | | | | | | | | |
| | | | CAGU | RBGU | Totals | | | | |
| | | MIL | 30 | 0 | 30 | | | | |
| | | KLI | 21 | 5 | 26 | | | | |
| | | YAK | 6 | 0 | 6 | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

## AVIAN EXCRETA (SCAT, FECES) SAMPLING

As part of the Lamprey Predation study undertaken in 2024 roughly 65 scat samples were collected by project staff using materials supplied by Yakama Nation and Cramer Fish Sciences. Initial samples taken in July confirmed that AWPE are not eating salmonids at that time. Protocols were developed to identify and collect clean samples from target avian predators. Initial results greatly informed project biologist and led to an expansion to other target species for scat sampling to include gulls and DCCO and to continue to sample up to 5 from each species at JD and TD projects each month throughout the year. There is some indication that these sampling activities disturb and deter avian predators from project fishways so this effort should be considered a functional deterrent to predation near projects.

## RC BOATS

A brief trial with remote control boat was attempted but resulted in loss of the boat.

## TORI LINES

Tori lines were installed to discourage predators from east, west and south fishway entrances. Consistent results showed very effective deterrence, with almost all Pelicans and Cormorants avoiding the entrance areas when supplemented with audio or personel presence. This method was expanded to east exit effectively stopping DCCO foraging. Challenges exist with keeping the lines in place during variable flow conditions. Anchor and float modifications to lines and attachments will require continuous maintenance.

## SOUND SYSTEMS

There are various sound bird deterrent systems on the market. Bird Gard Pro system was purchased and deployed at various locations around project during spring and summer 2024. There appears to be some deterrence, when supplemented. Foxpro audio predator call system was also purchased and has shown the ability to deter gulls and cormorants near project fishways when combined with other deterrents..

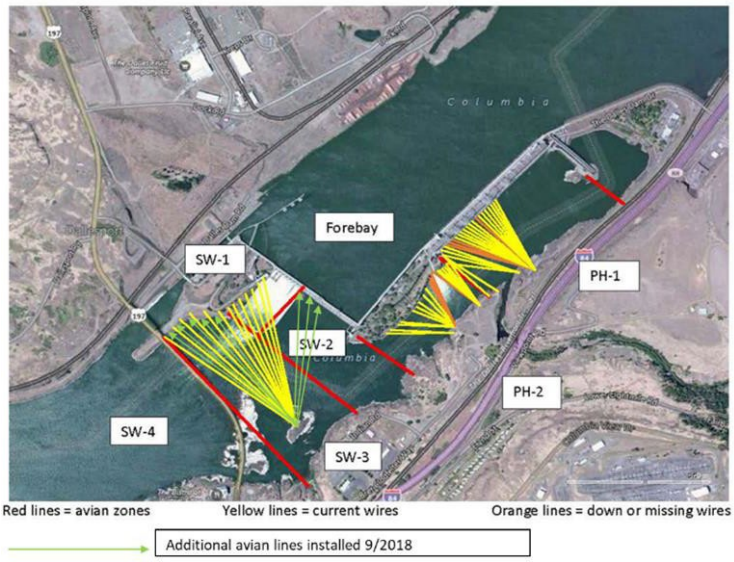
## AVIAN (GULL) LINES

Avian lines have been used for decades with mixed results. Effectiveness is dependent on river flows and many other factors. The typical daily spill pattern at The Dalles is to reduce spill in mid morning, then increase spill volume mid afternoon. This coincides with a normal decrease in gull foraging at mid day. As spill volume often increases further by 6pm, gull foraging increases in SW4, outside of lined areas in SW3. The addition of new lighting on the 197 bridge allowed many gulls to forage into dark hours under bridge lights. ODOT turned bridge lights off after 11pm and indications were no gulls persisted foraging after that time but incidental observations through most of May 2024 saw large flocks of gulls potentially extending predation rates on salmonids in unlined areas.

There was some indication that pelicans also fed after dark but monitoring was sporadic and not part of daily counts. Fixed lines do not deter pelicans, cormorants, mergansers, eagles, grebes and Bonaparte's gulls from feeding. While lines may move gulls away from feeding hotspots, this may only serve to enable pelicans and cormorants to dominate in hotspot feeding areas.

No avian lines were repaired or maintained in 2024, as mylar or other streamers have a short life span and cannot be replaced without removing the lines. All of the north side attachment points for lines were labeled in December and 4 lines at ITS outfall were found missing as well as lines at the spillway and north peninsula.

In addition, partial netting was effectively maintained over a small section of east fishladder weirs downstream of the 180 bend to help deter great blue herons during peak of the adult shad run.




## GREEN LASER

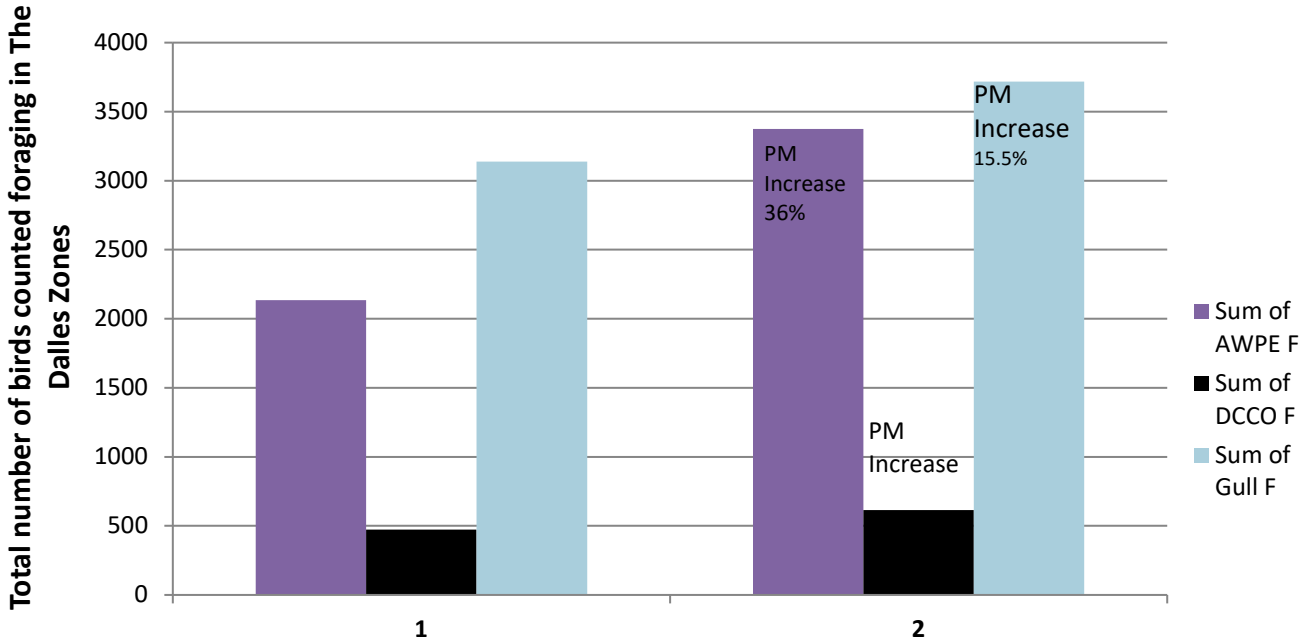
Agrilaser 300mW(handheld laser) was used infrequently, again in March/April and October, limited to targeting cormorants. Agrilaser use continued during the winter months to deter breeding cormorants from forebay towers. After June, nests on BPA towers appeared to fledge young but reduced by about ½ from previous year.

## DETERRENT SUMMARY

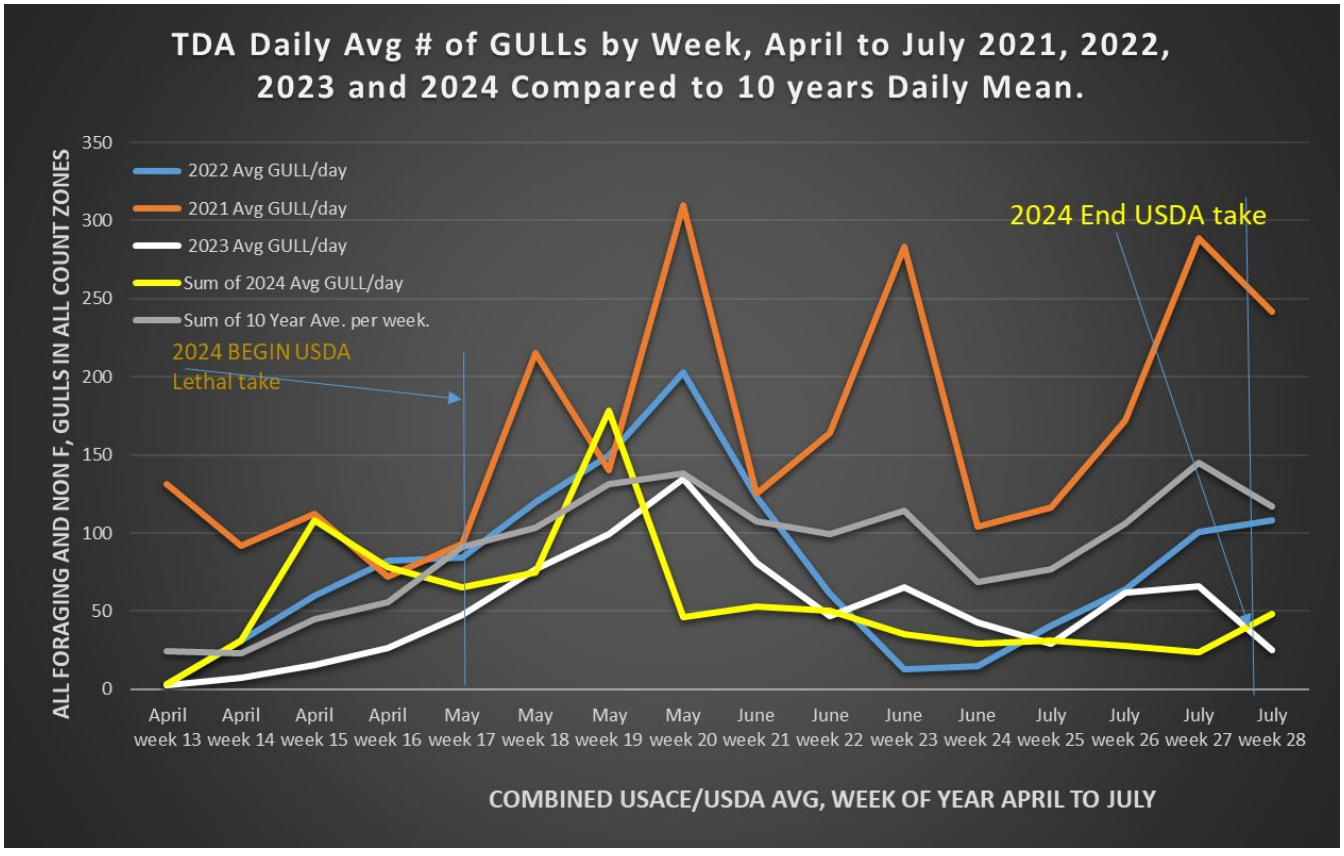
Many factors control avian predators access to particular locations and hungry birds are very adaptable to opportunities. Unfortunately the combination of environment and operations in 2024 may have led to opportunities for evening and nocturnal foraging by gulls and possibly other bird species, to feed on salmonids after dark under ODOT bridge lights on US 197 bridge at TD before 11pm. As the graph below shows, there was significant increase in the number of all species of avian predators in afternoon hours, when active deterrents ceased due to wind, safety and staff limitations. The intention is to apply falconry 2025 in these afternoon hours to disrupt this feeding cycle from developing further.

## TRENDS

Once daily counts were performed by USACE fisheries staff alternating morning and afternoons each week. USDA performed alternating count each day before and after their deterrent activities. Counts were then combined to create a daily mean avian count consistent with identical method in use at JD project in 2024. In addition, USDA staff performed counts once a day, and generally found more cormorants in certain areas due to their boat access. The following graph shows the stabilization in the GULL daily counts trend during falconry abatement of 20 days with 7 days a week USDA boat pyro with lethal reinforcement of CAGU and DCCO.




1=AM count, 2=PM count. All Foraging Birds April to July 2024. Twice daily counts. AM count generally completed prior to pyro/lethal take. PM count generally completed after pyro/lethal take before 5pm.




Graphic above shows reduction in June/July, and stabilization of daily average number of gulls during the past 2 years.

## PIT Tag Recovery / Data Uploads

To study the impact of predatory birds on juvenile salmon, a biomark PIT tag scanner was used to search areas in SW4, PH1 and along walkway under BPA towers with nesting DCCO at the navlock approach.. Areas west of count zones around 3 mile creek mouth known to have tags recovered in previous years were scanned in 2024. Two avian recovery sites were established west of TD tailwater, (TDLPI-Lone Pine Islands) and (TDTMI-Three Mile Islands).

Further analysis of the tag histories and locations are underway to assist project managers. Tag recovery locations and density can inform project biologist of avian predation patterns and complement PIT tags recovered from avian lethal take. Small numbers of tags were found on downstream island (TDTMI) which was seeded with 50 test tags to measure detection efficiency in 2023.

Ground scanned recoveries are uploaded to sites TDTMI, TDLPI and TDBPAT (The Dalles BPA Towers) on PTAGIS.org to indicate close association with avian predation at TD. COLR4 has records associated with the pikeminnow dam angling program recoveries including tags recovered from small-mouthed bass, etc sampled for eDNA in lamprey predation study. PIT tags recovered from lethal take of gulls and DCCO will be uploaded to COLR4 which will make data available to the Lamprey predation study.

PIT tags were recovered under osprey nest platform near the north count station and in osprey roosting areas. PIT tags were also obtained from live sturgeon during dewatering east ladder in December 2024.

PIT tags were recovered 3 times in 2024 along the walkway under the BPA towers along the north upriver guidewall to the navigation lock, first time prior to nesting in Feb. 2024. In March, 2024 BPA maintenance crew removed nest material, scanned nests for PIT tags and installed audio deterrent. These BPA towers are a known cormorant breeding colony with ~65 nest attempts in 2022 reduced to ~15 nests in 2024. The area was scanned again in Oct. 2024 to recover new tags resulting from recent avian predation.
The walkway is only 8' wide and is unbounded on the north side. A small percentage of the PIT tags migrate out of the nests onto the walkway and then are carried by wind and water into the river bottom. The vast majority of area under the towers is over water and not recoverable. DCCO displaced from these towers were likely relocated to a tower on an island several miles downriver near the community of Murdock, WA. Large numbers of PIT tags were recovered by RTR in a ground scan in late 2024, indicating a new nesting colony with substantial salmonid predation.

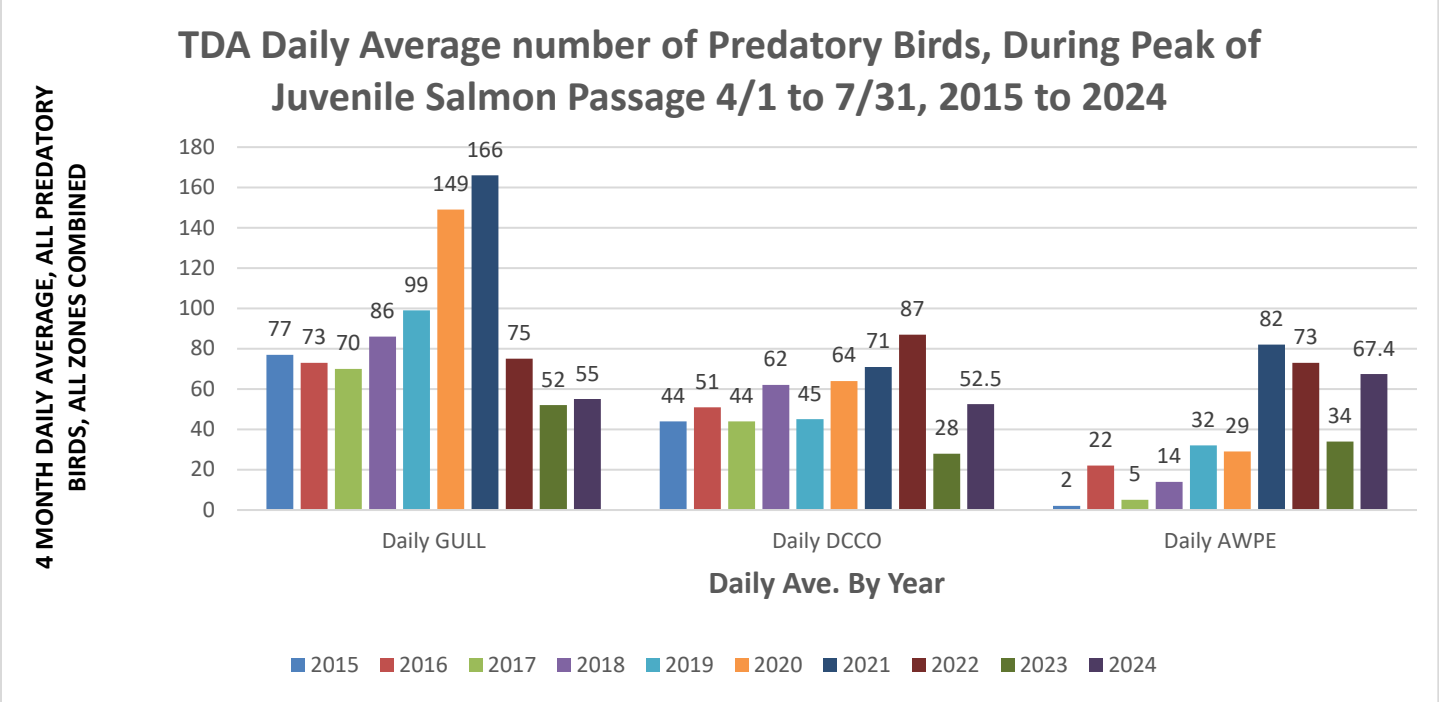



Table above compares average number of three main piscivorous birds counted daily. Deterrent efforts did not result in a decline in cormorants, and gulls in spite of lethal removal. Pelicans were not targeted with deterrents in 2024 except as incidental to other species.

# Avian Discussion

Project fisheries staff provided daily avian counts for most of the year 2024. The highest bird counts were on the spillway side of the dam downstream of The Dalles US-197 bridge (SW4). The majority of resting birds were cormorants in the forebay (FB) often perched on the forebay transmission towers near the Washington shore and pelicans perched on the rock islands downstream of the bridge (SW4). Daily counts were highly variable, but gulls and cormorants were significantly reduced compared to the 2015 daily average observed during fish passage season (4/1-7/31). California and ring-bill gulls daily average for 2024 was nearly identical to 2023 at 55 but predation rate in evening hours are unknown and significant numbers of CAGU (many first year) returned to project to feed on immature shad in Nov./Dec.indicating good fledging success in 2024. Daily mean number of cormorants increased to 52.5 from 28 in 2023. BPA maintenance may again remove nest material and/or install wire deterrents to nesting on their towers in 2024.

Pelicans daily mean numbers increased to 67.4 in 2024 from 34 in 2023 likely due to tori lines and reduced pyro from USDA staff reducing noise complaints from Oregon shore residents. Other fish-eating birds in small numbers included: great blue herons, grebes, mergansers, osprey and bald eagles. Great blue herons have some salmonid predation as PIT tag recoveries at Avery island indicate. 20-30 grebes were observed in the fall feeding in the forebay, and mergansers fed in the fall and winter months during the juvenile shad outmigration.

There continue to be high numbers of bald eagles overwintering in Westrick Park, feeding primarily on post-spawn adult shad. Previous studies have shown no interaction with gull lines.in PH2. Monitoring in 2024 attempted to evaluate interactions of gull lines and gulls as well as falconry abatement and pyrotechnic deterrence. Efforts are being made to increase the avian abatement success within agency guidelines. Avian lines were inspected by engineering and fisheries staff, hazing schedule is scrutinized and other means, such as falconry abatement are being pursued to reduce salmonid predation.

The use of lethal removal at the dam has been permitted and is expected to continue on gulls and cormorants in spring 2025, with continued take by USDA to be included in Lamprey Predation eDNA study. The relationship between rate of take of CAGU over 8 per day correlates strongly with reductions in total gulls on project at TD. In 2024, due to start up process only 2-3 gulls were taken each day during peak of salmon outmigration in May weeks 1-3 at TD. Significant effort will be made to increase the rate of CAGU taken in early May weeks to provide sufficient deterrent to reduce total gull numbers in TD count zones.

## NEARBY GULL BREEDING COLONY

Little Miller Island (Miller Rocks), Columbia River, RKM 331 is a well known nesting colony of 5-6000 breeding California gulls and to lesser extent ring-bill gulls located east of Miller Island upstream of the mouth of the Deschutes river. Daily counts of gulls at The Dalles and John Day likely reflect breeding adult numberss from April to June each year. Since 2015, PIT recovery efforts from the island revealed substantial predation on ESA listed salmonid species, a proportion of which come from below The Dalles and John Day Dams. Tribal efforts were made to reduce the number of breeding birds on Miller rocks in March/April 2024 with unknown success. Significant numbers of CAGU take at TD were subadult birds, likely not associated with the breeding colony on Miller Rocks. Expectation is to repeat this effort in 2025 with adult lethal removal.

# Zebra/Quagga Mussel Monitoring

Eight mussel samples were collected in 2023. No *Dreissena* mussels were detected during USACE and PSU early detection monitoring throughout the Columbia River Basin in 2024. Monitoring was focused on water bodies with a high to medium likelihood of *Dreissena* mussel introduction and/or establishment during the period of expected peak mussel spawning (June – September).

Product Development Teams

**Backup Auxiliary Water System Debris Management** – Installed in 2016 as a backup to the east fish ladder fish unit attraction flow, the AWS experiences problem trash rack plugging when operated. A PDT was developed to determine an alternative to maintaining a clean trashrack during operation. This is especially need when Fish Units undergo rehabilitation, requiring each to be out for a full season. Alternatives reviewed include debris boom barrier, trash rake system, trash rack replacement.

**Lamprey Improvements** – A Lamprey Passage System installation in the junction pool of the east fish ladder started the winter of 2023/24. This includes a flume to the floor of each side of the channel leading a holding tank under the east ladder. Also included are modified extensions for the entrance weirs to have a plate covering several wall guides allowing lamprey attachment points through higher velocity areas. Onsite maintenance crews also completed lamprey orifices in 154-157 as part of this program.

## RESEARCH

The following are a list of fish related research and contract personnel that were on site during the 2023 passage season;

Avian Solutions – Falconry contractor conducted avian abatement.

4 Peaks – Fish counting contractors performed fish counts at the north and east fishways via count stations.

Washington Dept of Fish and Wildlife – Conducted Pikeminnow dam angling primarily from powerhouse tailrace deck.

Oregon Dept of Fish and Wildlife –Captured, tagged, and collected biological data from northern pikeminnow as part of an evaluation of the Northern Pikeminnow Management Program.

Oregon Department of Fish and Wildlife and Fish Passage Center – Continued to provide once monthly fishway inspections of adult and juvenile systems.

Pacific States Marine Fish Commission – FERC required sampling at the Northern Wasco County PUD intake structure as per the Cooperative Agreement between Pacific States Marine Fisheries Commission and Wasco County PUD.

Pacific States Marine Fisheries Commission PTAGIS Information System – monitored Thin Wall PIT Tag detection system in The Dalles east and north count stations.

U.S. Dept of Agriculture – Provided boat only avian hazing of piscivorous birds to reduce avian predation on juvenile salmonids May to August via pyrotechnics during juvenile passage season.

U. S. Geological Survey – Total Dissolved Gas (TDG) and water temperature monitoring.

CTUIR - Captured adult Pacific lamprey as part of the on-going project to restore lamprey to various tributaries.

Zebra and Quagga Mussel Monitoring in the Columbia River Basin by the U.S. Army Corps of Engineers and Portland State University 2023 Final Report for *PSMFC Grant 23-150* **2023 Final Report**

END OF REPORT

Approved by; Ron Twiner, Operations Project Manager, The Dalles Dam