2013 ANNUAL FISHWAY STATUS REPORT

THE DALLES DAM

Date: Jan, 2014
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INTRODUCTION

The Dalles Dam has specific requirements for Columbia River fish passage, which are specified in the annual Fish Passage Plan. The Dalles Dam has two fish ladders for upstream adult fish passage, and an ice trash sluiceway and spillway that are used for downstream juvenile fish passage. The following document is a summary of all fish related activities that occurred at The Dalles Dam in 2013. In addition Northern Wasco Co PUD has a turbine that supplies auxiliary water to the north fishway, which has a complete juvenile bypass system. Information on this systems operation can be acquired through Pacific States Marine Fish Commission.

FISHWAY OPERATING SCHEDULE

The following information includes fish passage system operation for calendar year 2013. Total length of time for annual fishway outages can be determined by referring to previous years' annual reports. These fishways were closed or dewatered for maintenance when they were not in operation.

East Fishway in operation; Jan 22 – Dec 3
East Fishway attraction water off half day for midseason ROV grating inspection Aug 6

North Fishway in operation, Jan 1- Jan 27 and Mar 1 – Dec 30
North Fishway attraction water off half day for midseason ROV grating inspection Aug 6

Ice Trash Sluiceway (6 sluicegates) open for juvenile passage Mar 1 – Dec 1
Ice Trash Sluiceway (4 sluicegates) open for juvenile passage Mar 1 – Mar 31 and Dec 1 – Dec 15

Spillway open for juvenile passage Apr 10 – Aug 31

DEWATERING FISH SALVAGE

FISHWAY DEWATERING PROCEDURES

Dewatering fishways provides the best opportunity for maintenance and inspection. To dewater the fishladders, exit bulkheads are installed and the ladder is allowed to drain. Entrance bulkheads are installed and dewatering pumps operated to dewater all areas of fishways below tailwater elevation. Fisheries personnel enter these areas to salvage trapped fish when water levels allow 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. A follow up inspection is made to capture any missed fish. 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.

THE DALLES DAM FISH LADDER DEWATERING RESULTS

Key; adult=a, juvenile=j, carp=cp, catfish=ca, sculpin=sp, shad=sh, small mouth bass=smb, crappie=cr, pikeminnow=pm, whitefish=wf

Date	Event	Chinook	Steelhead	Sockeye	Coho	Lamprey	Shad	Sturgeon	Other	Comments	Morts
2/4/13	N. upper	10j	1a,7j	0	0	7	0	0	0	none	0
12/3/13	E upper	1 + 3j	9j	0	0	3	179	0	0	a)	all shad
12/5/13	E lower	1	0	0	2	47	0	21	0	cold	0

a) All lamprey to river. Nez Perce did not come to pick up.

TURBINE DEWATERING PROCEDURES

Turbines are dewatered for routine overall maintenance or occasional forced outages. These usually entrap low numbers of fish, due in part to unit operational guidelines, which include running unit at full load and immediate tail log installation after unit shut down. If a turbine unit fails, dewatering guidelines cannot always be followed, which can result in higher numbers of fish entrapment. Fish removal from these areas has a greater fish stress risk due to handling. Procedures are continually analyzed to determine the best method for preventing fish stress or loss. Fish are removed from scroll case (sc) and draft tubes (dt) by fish bags. If numbers of fish require more than three bags, transport tanks are placed in the draft tube gallery for transport by crane. Fish are released to tailwater as soon as possible.

THE DALLES DAM TURBINE DEWATERING RESULTS

Key; adult=a, juvenile=j, scroll case=sc, draft tube=dt, catfish=ca, sculpin=sp, crappie=cr, small mouth bass=smb

Date	Event	Chinook	Steelhead	Sockeye	Coho	Lamprey	Shad	Sturgeon	Other	Comments	Morts
2/12/13	MU 2 sc	0	0	0	0	0	0	0	0	1.)	4
2/12/13	MU 2 dt	0	0	0	0	0	0	0	0	None	0
3/13/13	MU 4 sc	0	0	0	0	0	0	0	0	None	0
3/14/13	MU 4 dt	0	0	0	0	0	0	0	0	None	0
4/30/13	MU21sc	0	1j	0	0	0	0	0	0	none	0
4/30/13	MU21dt	0	0	0	0	0	0	0	0	none	0
6/27/13	MU19sc	0	0	0	0	0	0	4	0	2)	0
6/27/13	MU19dt	0	0	0	0	1a	0	3	1ca	3)	0
7/15/13	MU5sc	0	0	0	0	0	0	1	0	4)	0
7/16/13	MU5dt	0	0	0	0	0	0	1	0	5)	0
9/17/13	MU15 sc	0	0	0	0	0	0	0	0	0	0
9/18/13	MU15dt	0	0	0	0	0	0	7	1 ca	0	0

1.) Four adult shad, and one western grebe morts. Returned to tailwater.

2) Four sturgeon released to tailrace.

3) Three sturgeon and one channel catfish release to tailrace; one adult lamprey release to forebay.

4) One sturgeon ~ 3' released to tailrace.

5) One sturgeon ~ 4' released to tailrace.

THE DALLES DAM NAVLOCK DEWATERING RESULTS

Key; adult=a, juvenile=j, catfish=ca, sculpin=sp, crappie=cr, small mouth bass=smb

Date	Event	Chinook	Steelhead	Sockeye	Coho	Lamprey	Shad	Sturgeon	Other	Comments	Morts
3/9/2013	Navlock	0	0	0	0	0	0	0	0	None	0

When a unit is taken out of service for maintenance, the cooling water strainers are sometimes disassembled. Due to the concern of juvenile lamprey entrainment and the threat of zebra/quagga mussels, this area is inspected. Fisheries staff was not always notified when these are disassembled. Therefore it has been put into the preventative maintenance program as a reminder to maintenance staff.

MAIN TURBINE UNITS THIRD FLOOR COOLING WATER STRAINERS

Date	MU	Lamprey	Quagga Mussels	Zebra Mussels	Comments
3/5/13	MU18	3 juv	0	0	2 morts, 1 released
5/14/13	MU11	5 juv	0	0	5 morts
6/27/13	MU19	2 juv	0	0	2 morts
8/5/13	MU21	0	0	0	None
9/23/13	MU15	0	0	0	None
9/24/13	MU20	0	0	0	None

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Dewatering Fish Salvage Discussion

Efforts are made to prevent any fish mortalities. When mortalities occur, procedures are analyzed to determine how to correct for future dewaterings. Due to large numbers of adult shad (179) present in the east ladder upper section, the adult shad were slow to recover and resulted in many morts. Sufficient water was available throughout the process.

2010 - 2013 FISHWAY INSPECTION COMPARISON

Two fishway inspections were conducted per day during the adult fish passage season (March 1 to November 30). One fishway inspection was conducted per day during the non- passage season. A status monitor was installed in the fisheries office showing real time and 24hour information of the operation of east entrances, east ladder and north ladder. This information is recorded as a third inspection. Equipment calibration, gatewell inspection and drawdown's are also part of the inspection program. Guidelines are provided by the COE Fish Passage Plan. Weekly fishway status reports are provided to fish managers throughout the year. Status information is also provided at monthly Fish Passage Operation and Maintenance meetings. Comparisons are made with prior 3 years to track how equipment has been performing.
Fishway inspection data:

Inspection Criteria Comparison Chart	2013		2012		2011		2010	
The Dalles Dam	Total #	% OOC	Total #	% OOC	Total #	% OOC	Total #	% OOC
Number of inspections	894		907		689		760	
NORTH FISHWAY	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Exit differential	0	0.0%	0	0.0%	1	0.1%	0	0.0%
Count station differential	1	0.1%	0	0.0%	0	0.0%	0	0.0%
Weir crest depth	5	0.6%	1	0.1%	3	0.4%	23	3.0%
Entrance differential	1	0.1%	0	0.0%	2	0.3%	3	0.4%
Entrance weir N1	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Entrance weir N2	0	0.0%	0	0.0%	0	0.0%	0	0.0%
PUD Intake differential	13	1.5%	2	0.2%	5	0.7%	2	0.3%
EAST FISHWAY								
Exit differential	1	0.1%	0	0.0%	0	0.0%	0	0.0%
Removable weirs 154-157	12	1.3%	5	0.6%	24	3.5%	57	7.5%
Weir 158-159 differential	1	0.1%	1	0.1%	5	0.7%	19	2.5%
Count station differential	1	0.1%	0	0.0%	4	0.6%	1	0.1%
Weir crest depth	5	0.6%	1	0.1%	5	0.7%	2	0.3%
Junction pool weir JP6	11	1.2%	13	1.4%	5	0.7%	18	2.4%
East entrance differential	8	0.9%	7	0.8%	12	1.7%	5	0.7%
Entrance weir E1	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Entrance weir E2	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Entrance weir E3	0	0.0%	0	0.0%	1	0.1%	0	0.0%
Collection channel velocity	0	0.0%	0	0.0%	0	0.0%	0	0.0%
West entrance differential	12	1.3%	5	0.6%	5	0.7%	1	0.1%
Entrance weir W1	1	0.1%	0	0.0%	2	0.3%	1	0.1%
Entrance weir W2	2	0.2%	0	0.0%	2	0.3%	0	0.0%
Entrance weir W3	1	0.1%	0	0.0%	0	0.0%	0	0.0%
South entrance differential	11	1.2%	9	1.0%	3	0.4%	4	0.5%
Entrance weir S1	7	0.8%	2	0.2%	13	1.9%	6	0.8%
Entrance weir S2	9	1.0%	4	0.4%	4	0.6%	4	0.5%
JUVENILE PASSAGE								
Sluicegate operation	27	3.0%	70	7.7%	10	1.5%	82	10.8%
Turbine trashrack drawdown	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Spill volume	50	5.6%	144	15.9%	81	11.8%	40	5.3%

Spill Pattern	0	0.0%	0	0.0%	1	0.1%	0	0.0%
Turbine Unit Priority	58	6.5%	125	13.8%	20	2.9%	180	23.7%
Turbine 1% Efficiency	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Inspection Discussion;

Areas with greater than 1% criteria violation are indicated in red. The following are details on these data;

-The PUD intake differential was out slightly more than previous years due to PUD rake malfunction. Repair was delayed due to budget constraints. Rakng was completed with mobile crane when available.

-Removable weirs 154 – 157 were out more than last year, but still considerably less than prior years. Weir 156 was primary problem and was usually only out of sequence by 0.1'.

- Junction pool JP6 was out similar to last year due to low tailwater in the fall. It will be pulled earlier to maintain criteria.

-West entrance differential was out more than previous years due to low tailwater during Oct/Nov. It was manually adjusted.

-South entrance differential and S1 weir was also out more than previous years due to low tailwater conditions during Oct/Nov.

-Sluicegate operation improved over last year, but still remained somewhat high. This was a result time between unit maintenance outages and crane crews able to move chaingates. A modification has been put in Fish Passage Plan to address this issue. There was also a period of time the unit 19 was expected back in service, but ran into delays.

-Spill volume was out less than last year due to more stable river flow and gas conditions, but still remained above 5%. This is controlled by RCC.

-Turbine priorty improved over last year due to operation clarifications. Synchronous condensing will no longer be considered an operating unit in the new Fish Passage Plan.

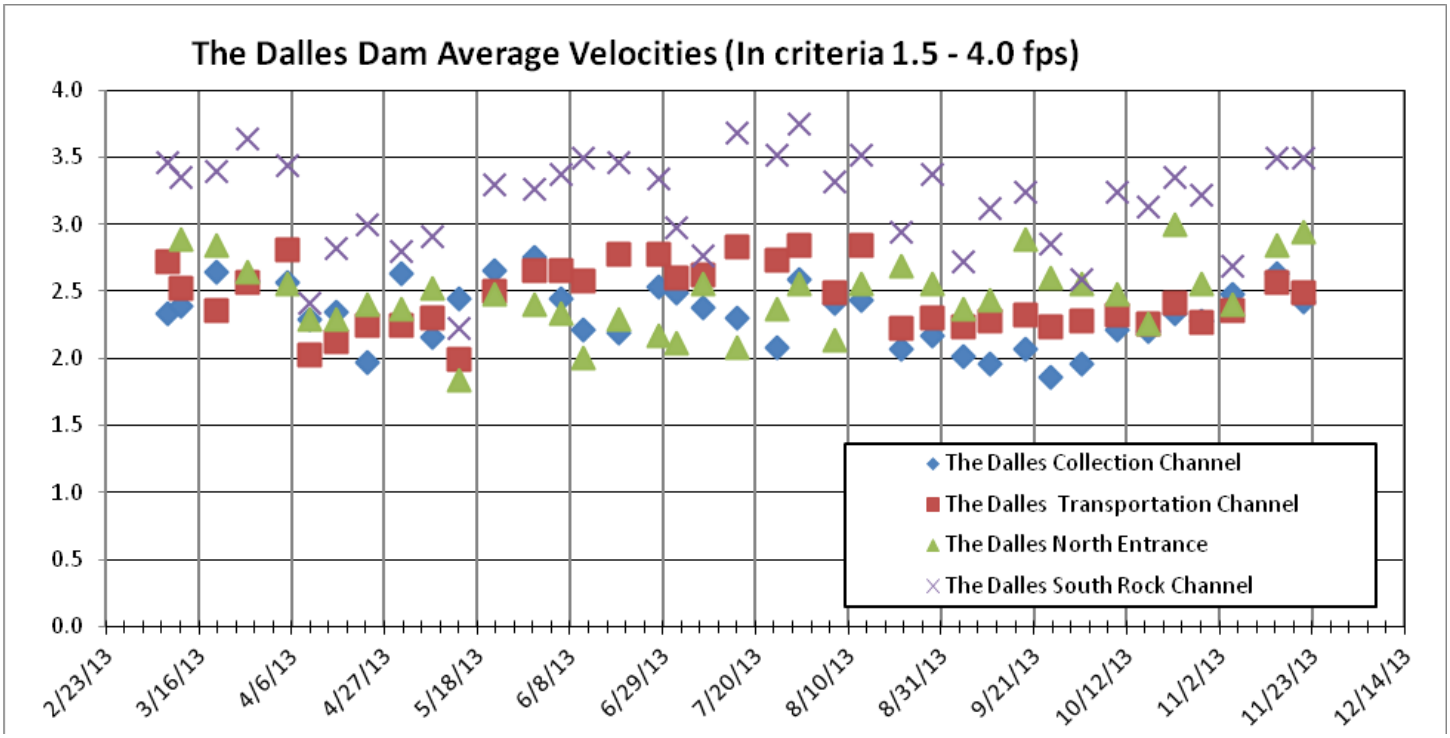
MAINTENANCE ACCOMPLISHMENTS AND PLANS

1) All entrance weirs, used diffusers and count station equipment has been inspection and had preventative maintenance as needed.
2) New diffuser grating was installed in the west and south entrances during '12/'13 winter outage season. Additional securing strapping was installed during '13/'14 winter outage season due to concerns with brittle brass attachement studs.
3) East count station window brush chain guard was damage mid season and repaired during the winter outage.
4) Entrance weir W1 wheels were replaced with new plastic composite wheels to reduce stainless/mild steel corrosion. This will reduce the weir guide wear that has been noticed over the past several years. These wheels will be used on other weirs as they become availabe.
5) Weir 159 was removed from slot for closer inspection. All weir wheels required replacement and the guides required added steel due to wear. One of the weir leafs was hanging up on a rubber seal. The rubber seals were replace and adjusted. Weir 158 is expected to be in the same condtion and will be removed next winter outage. Plans may include building a new weir due to high cost of rehab.
6) Collection channel dewatering pump #6 was not working and was removed. Damages electrical conduit was found. Collection channel pump #3 is stuck and cannot be removed, likely due to suspect electrical conduit as well. Plans are to remove all remaining 8 pumps to assure more do not experience the same problems.
7) Fish unit 1 mechanical governor was replaced with digital as part of the powerhouse digital governor upgrade.
8) Forebay deck leakage into gallery over electrical panel for east exit was partially repaired. Deck drains were flushed to decrease standing water. Expansion joints are being re sealed. Once all leakage is stopped, planning for replacing this antiquated electrical panel will resume, pending funding.
9) Collection channel diffusers (58) are all closed and no longer needed. Long term plan is for permanent closure and valve assembly removal. This is low priority and will depend on funding. No planning of design have been made to date.
10) North fishway rock walls are showing more sluffing. This is both a fishway concern as well as a personnel safety concern. Portland district Geotechs have been asked to look into condition and potential repairs. This will likely be a high cost item and will not be affordable under near term O &M budgets.
11) North fishway vegetation grown into rock walls require removal each year to prevent more rock sluffing. This usually takes 2 full weeks. Goats were contracted during spring and fall but were unsuccessful reaching all vegetation.

Calibration checks on all water level stillwells and weirs are done weekly to assure accuracy. Maintenance is notified when they found off by more than 0.3'. Human error and weather conditions is factored into the results. Overall, entrance weirs, channel stillwells and tailwater stillwells showed an improvement over last year.

Gatewell drawdowns to determine turbine intake trashrack debris loads are also checked weekly. As in previous years, all maintained well within the criteria limit. No gatewell drawdown measurements have been found out of criteria to date.

Weekly Water Velocity Measurements



Water Velocity Discussion

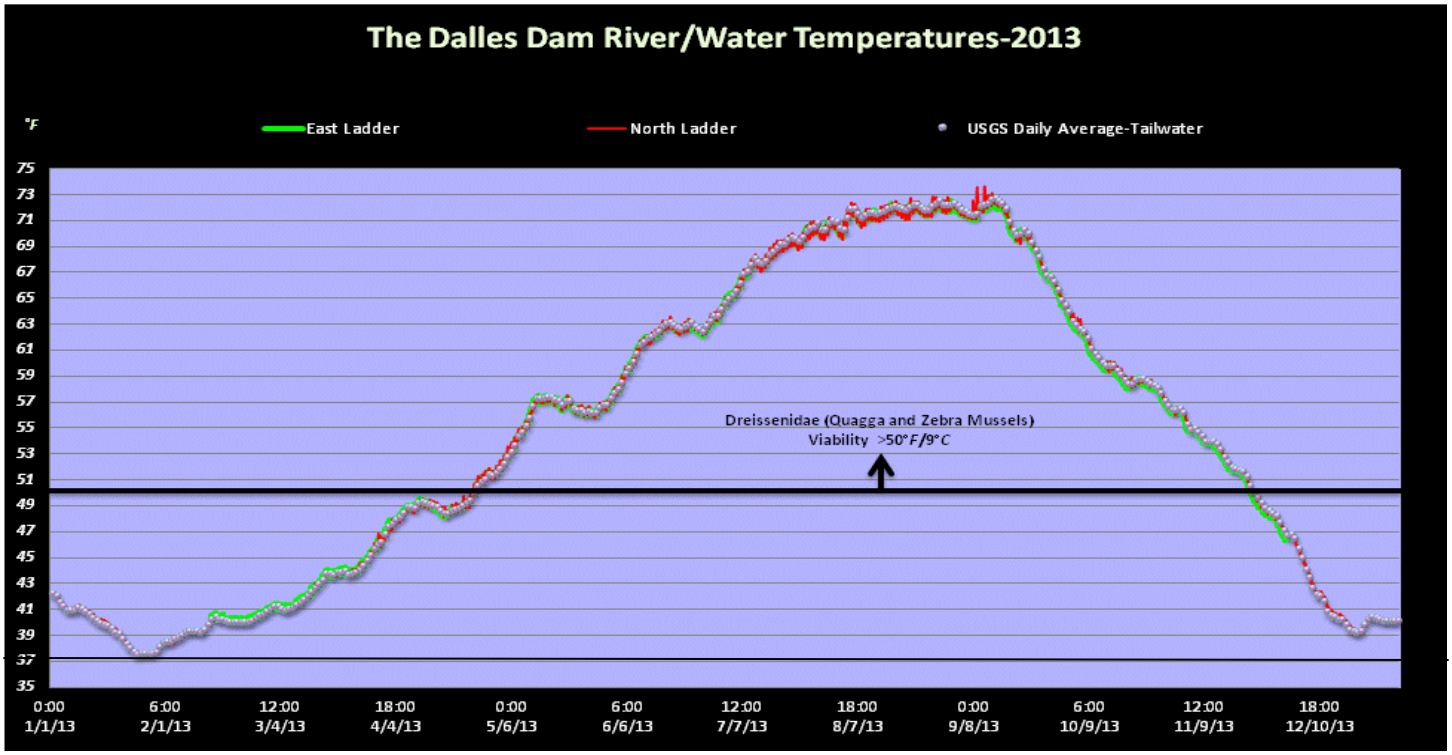
Fishway channel water velocities were measured three times weekly during Adult Fish Passage Season (Mar1 – Dec 1). Wood floats were timed through all fishway channels that are supplemented by auxiliary water and results were provided in the project weekly fishway status report. Criteria velocities of 1.5 to 4 fps were maintained throughout the fish passage season. Velocities were not always taken at unit 22 due to turbulence preventing float tracking. Velocity is generally slower from junction pool to unit 21. Past University of Idaho analysis did not reveal passage problems in this area.

FISH COUNTING

Visual fish counting was conducted 4/1/12 to 10/31/12 by Normandeau Environmental Consultants contract. Counts were loaded to the COE website. Video counting was performed during the off season. Refer to Corps of Engineers 'Annual Fish Passage Report' 2012 for fish count and comparison to previous years.

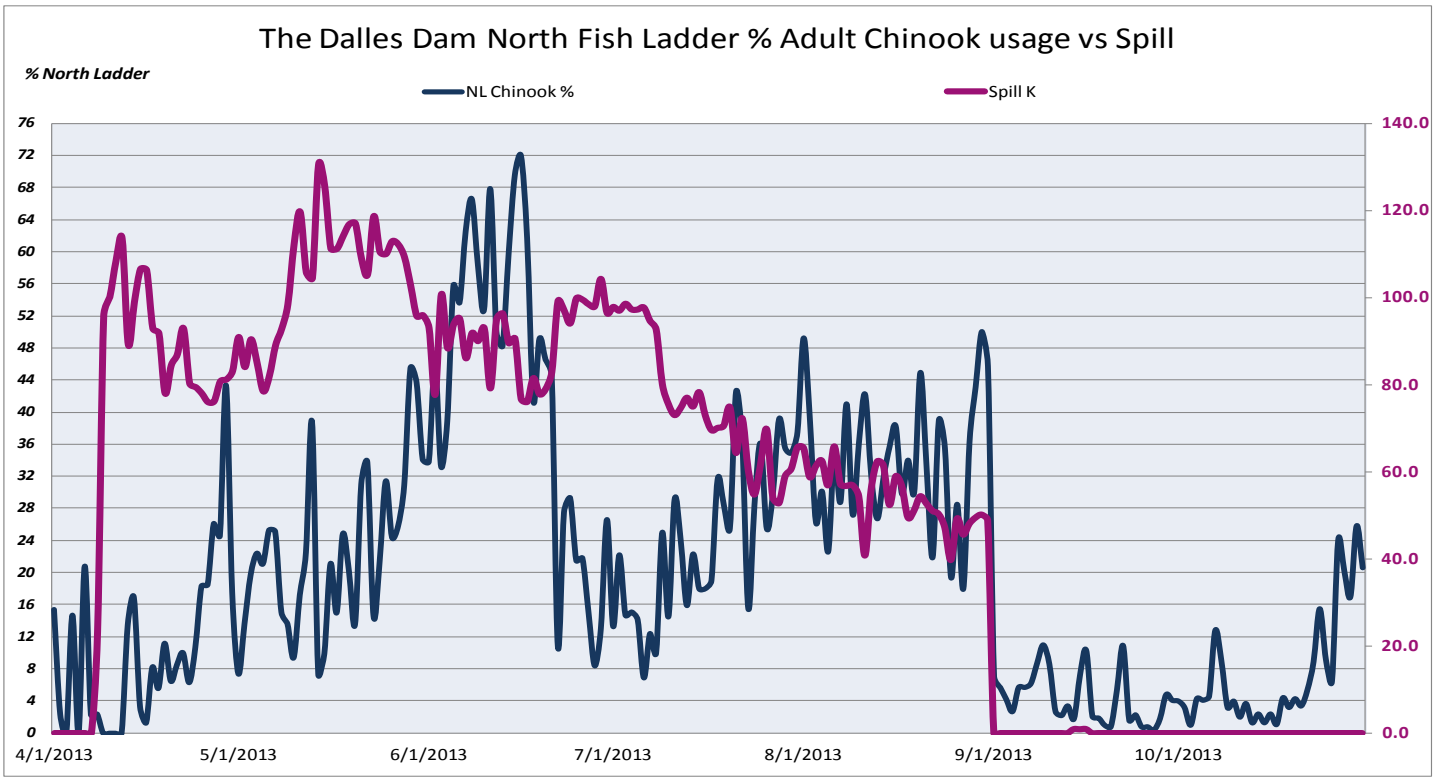
WATER QUALITY

Water clarity was read by secchi dish at the count stations. Water clarity data is not included in this report due to its questionable accuracy. This data was collected per regional request to maintain historical data base. Temperature monitoring with data loggers in each fishway is provided biweekly in the fishway status reports. The following graph is a compilation of weekly readings collected by data loggers in the east and north fishladders, immediately upstream of the count stations.



NORTH LADDER PASSAGE VS SPILL

Spill operation has been documented to affect north fishladder passage in the past several years. Spill >110KCFS tended to block salmonids from entering the north ladder. This was very apparent early May to early June 2012 when spill volume dropped below the 110KCFS and passage increased. In 2012, spill reached approached 200KCFS twice and passage remained low. It did not reach the 230KCFS mark as it did in 2011, so we did not see the return of passage after the ~220KCFS mark as we did in 2011. This was not evident for Chinook jacks or other salmonids. The theory remains that spill from ~110KCFS to ~220KCFS impedes north passage for adult Chinook. It was again clearly demonstrated that with no spill, salmonids are not attracted to the north entrance area either; hence the drop in north passage immediately after spill stops. Monitoring to north passage trends will continue.



AVIAN PREDATOR ABATEMENT

United States Department of Agriculture (USDA) was contracted to provide avian hazing abatement via pyrotechnics, from mid Apr – July 31. Fish Field Unit's avian predation study 2013 in progress. The following graphs are summaries of birds observations recorded during the twice daily fishway inspections.and locations of the avian lines zones (Figure 3).

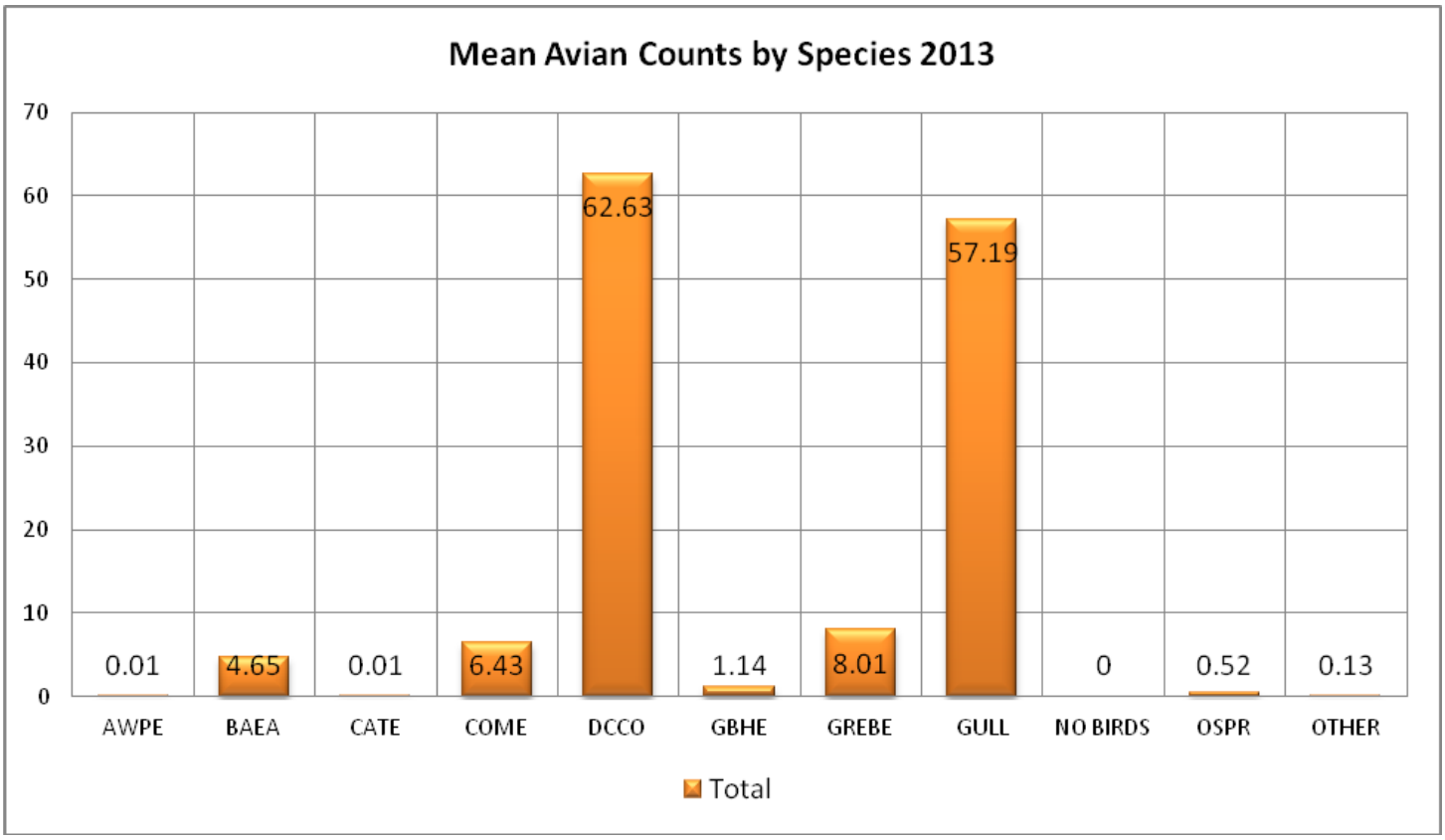


Figure 1. Avian Mean Counts by Species 2013

Bird Codes:

AWPE – American White Pelican

BAEA – Bald Eagle

CATE – Caspian Tern

COME – Common Merganser

DCCO – Double Crested Cormorand

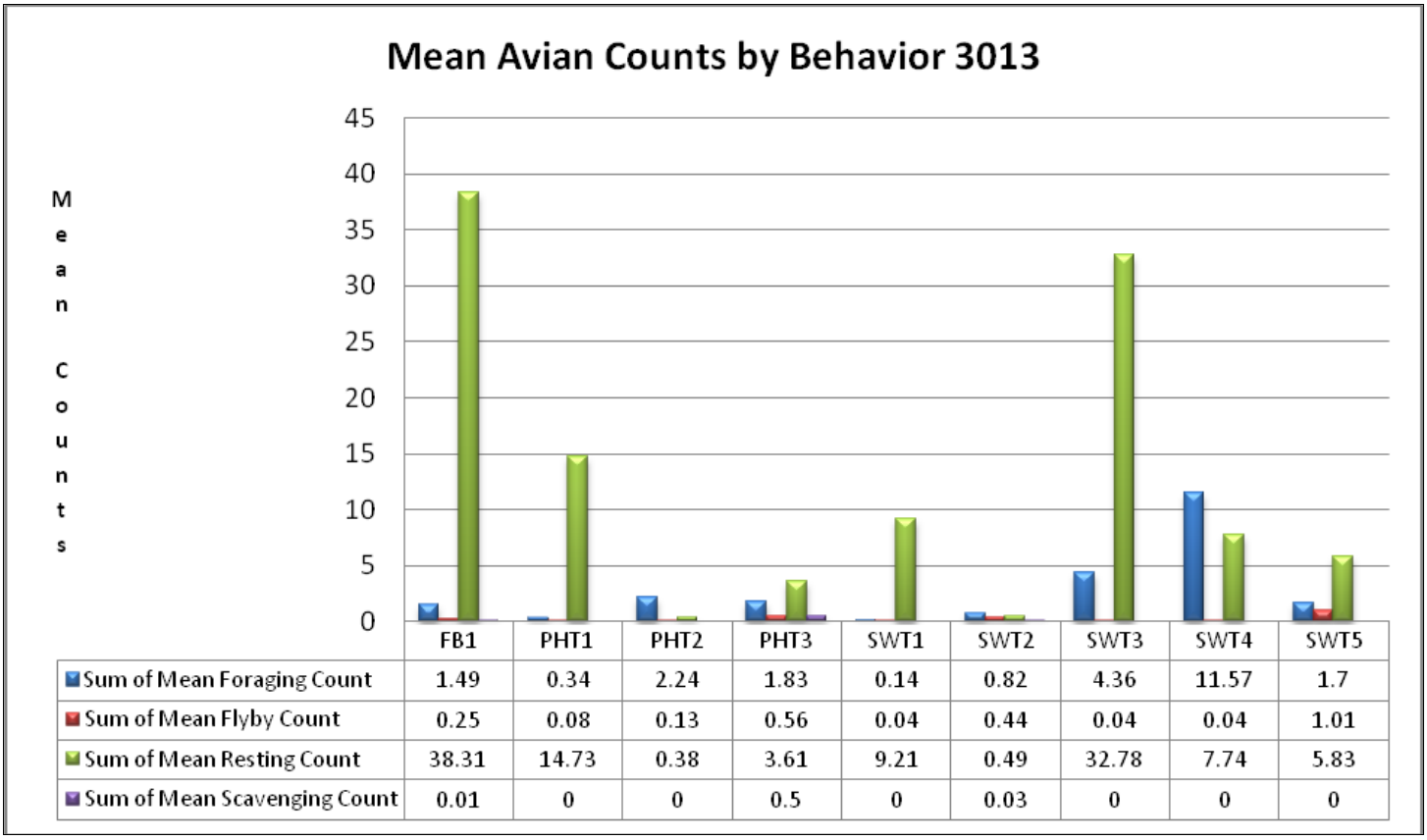
GBHE – Great Blue Heron

GULL – All Species

NO Birds – None of The Nine Species Present

OSPREY - Osprey

OTHER – None of These Nine Species Present



	FB1	PHT1	PHT2	PHT3	SWT1	SWT2	SWT3	SWT4	SWT5
Sum of Mean Foraging Count	1.49	0.34	2.24	1.83	0.14	0.82	4.36	11.57	1.7
Sum of Mean Flyby Count	0.25	0.08	0.13	0.56	0.04	0.44	0.04	0.04	1.01
Sum of Mean Resting Count	38.31	14.73	0.38	3.61	9.21	0.49	32.78	7.74	5.83
Sum of Mean Scavenging Count	0.01	0	0	0.5	0	0.03	0	0	0

Figure 2. Avian Mean Counts by Behavior 2013

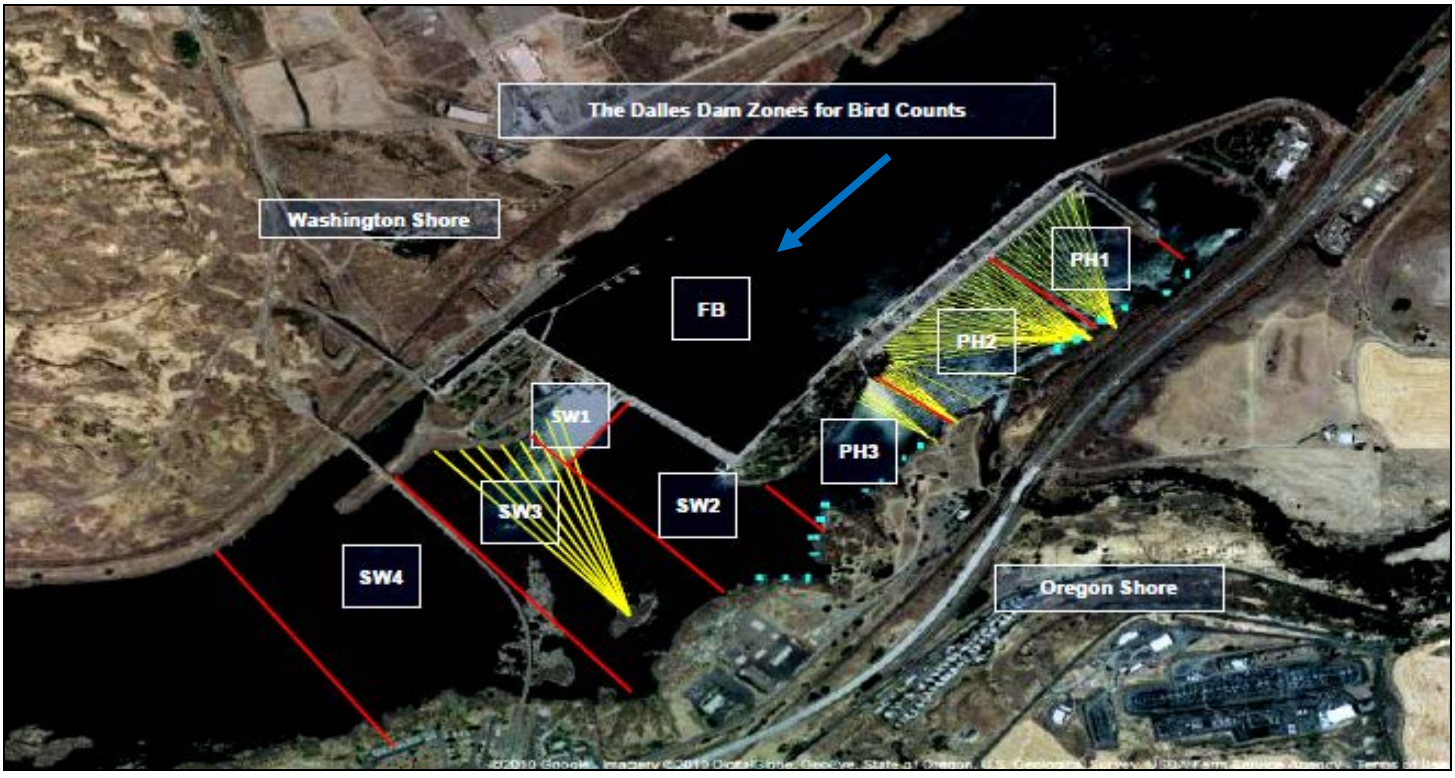


Figure 3. The Dalles Dam Zones for Bird Counts

Avian Discussion

The bird count data was collected from fishway inspections twice daily and once daily from Dec. 1 to March. For 2012, the hand held X-tablet uploading to the data base (Avian Consumption Study Data Portal) started mid-April and continued for all of 2013.

Most of the gull feeding activity occurred just up stream and down stream of The Dalles Bridge (SWT3 and SWT4). Due to the high cost of gull hazing by boat, shore hazing was selected for 2013. The high numbers of cormorant numbers is primarily roosting behavior. Cormorant near dam feeding behavior starts to occur in November and December when the shad juvenile outmigration peaks. The high numbers observed in the forebay are roosting in the power line towers and north side debris boom. There was a substantial gull number increase in May and Cormorant increase in September.

EAGLES

There have been high numbers of Bald Eagles overwintering in Westrick Park. The highest number (72) and weekly mean (37) were observed mid-January. They feed primarily on out migrating shad. Concerns have been raised on the potential impact with avian lines. Eagle observations are a continuation of Fisheries Field unit and project fisheries monitoring eagles to determine if avian lines interfere with this behavior. Results showed that eagles appear to avoid the present avian line array and feed primarily in the line free areas. It also appeared that eagles see the location of all the lines and there were no flinches or last second avoidance behavior while near the lines. Refer to Fisheries Field Unit "Evaluation of Interation Between Overwintering Bald Eagles and the Avian Line Array at The Dalles Dam 2013" report for further details.

SEA LIONS

Sea lions sightings have become more common from The Dalles Dam. To date, two (2) different sea lions have been identified from the dam. No sightings have been made inside the fishways to date, but several have been in close proximity to an entrance. The following is a log of all the sea lion sightings in 2013. Note: California sea lion (CSL); for locations see Figure 3.

Date	Time	Species	Activity	Location	Notes
01/07/13	1000	CSL	Swimming	PH2	
01/11/13	1012	CSL	Swimming	SW3	
01/14/13	0943	2X CSL	Swimming	PH3	
01/17/13	0830	CSL	Swimming	SW3	
01/24/13	0900	2X CSL	Swimming	PHT3	
02/01/13	1549	CSL	Swimming	PH2 - West ent	
02/27/13	0930	CSL	Swimming	PHT3	
02/28/13	1045	CSL	Swimming	PHT3	
03/14/13	0749	CSL	Took fish	SW2 Right in front of south entrance	
03/27/13	1421	CSL	Swimming	PH1 in front of east entrance	
03/29/13	1500	CSL	Swimming	MU5 tailrace	
04/04/13	0823	SL	Swimming	PH2 upstream of Ice/Trash Sluiceway	
04/05/13	0902	SL	Swimming	PH2 <20' from W2	
04/07/13	1508	SL	Swimming	~ 50' from PHT2	
04/15/13	1200	SL	Swimming	~ 20' from PH2	
04/16/13	1512	CSL	Took fish	~ 100' from PH2, salmonid	
04/18/13	1450	CSL	Swimming	~ 20' from PH2	
04/19/13	1028	CSL	Swimming	<20' from PH2	
04/20/13	~1700	SL	Swimming	S. Ent	
04/21/13	0932	CSL	Swimming	W. Ent.	
04/21/13	1319	CSL	Swimming	W. Ent.	
04/22/13	0926	CSL	Swimming	W. Ent.	
04/22/13	1500	CSL	Swimming	W. Ent.	
04/23/13	1440	CSL	Swimming	~ 300' from PH2 west entrance	
05/01/13	0730	(2) CSL	Took Salmon	PH2 two sealions near west entrance, one with salmon	
05/01/13	1300	?	took salmon	300' from west entrance	
05/01/13	1350	?	Swimming	East entrance near tower	
05/04/13	0900	CSL	Took salmon	SW2 near south entrance observed by USDA hazer.	
05/05/13	0930	(2) CSL	Swimming	PH2 near west entrance observed by USDA hazer.	
05/06/13	1243	CSL	Swimming	JR west ent.	

05/11/13	1510	CSL	Swimming	West entrance
05/12/13	0745	CSL	Swimming	West entrance
12/3/13	800	CSL	Took fish	Tailwater near main turbine unit 15; brand - C014
12/5/13	900	CSL	Swimming	Tailwater near main turbine unit 15; unable to determine brand.
12/9/13	900	CSL	Swimming	Tailwater near main turbine unit 15

PIKEMINNOW ABATEMENT

Washington Dept Fish and Wildlife gained access to The Dalles Dam and the Boat Restricted Zone (BRZ) for the purpose of hook and line dam-angling in support of the on-going BPA funded Columbia River Predator Control ProgramDam angling occurred from May through Sept, in conjunction with ODFW and PSMFC.

ZEBRA/QUAGGA MUSSEL MONITORING

Zebra mussel veliger sampling was conducted from June to August (Three samples total) via plankton tow. Samples were sent to Portland State University's Center for Lakes and Reservoirs for analysis. No mussels found to date. Program will continue in 2014.

RESEARCH

The following are a list of fish related research and contract personnel that were on site during the 2013 passage season.

University of Idaho – Downloading half-duplex PIT receivers and installing and maintaining radio telemetry equipment . Evaluated the effects of the extended spillwall and the resulting spill pattern on passage metrics of sockeye salmon and spring-summer Chinook salmon (adult and jack); monitored the movements of adult Pacific lampreys outfitted with half-duplex PIT tags and acoustic-tags (JSATS).

Oregon Dept of Fish and Wildlife – Ongoing BPA-funded research associated with the Northern Pikeminnow Management Program. The pikeminnow sampler worked closely with the WDFW/PSMFCnorthern pikeminnow angling crew that fished The Dalles tailrace in order to collect diet smpling and biological data from harvested pikeminnow.

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

Washington Department of Fish and Wildlife – Performed dam angling from various locations on the dam to remove northern pikeminnow.

Normandeau Environmental Consultants – Continued to perform fish counting at the north and east fishways via count stations.

Pacific States Marine Fish Commission – Sampled North Wasco PUD turbine juvenile bypass system per FERC requirement.

Pacific States Marine Fisheries Commission - Participated in the Northern Pikeminnow Management Program (NPMP) dam angling fishery. Angling activities in support of study included hook and line capture, holding, PIT-tagging, examination, and gastric lavage.

Fisheries Field Unit – Provided over site and standardization to the piscivorous bird monitoring program at the project.

Fisheries Field Unit – Second and final year evaluating interaction between overwintering bald eagles and the avian line array.

U.S. Dept of Agriculture – Provided avian hazing April 16 to July 31 via pyrotechnics during juvenile passage season.

U. S. Geological Survey – Partially removed old research equipment from the powerhouse and spillway intake deck from past telemetry studies. To be continued 2014.

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

Confederated Tribes of the Umatilla Indian Reservation – Captured adult Pacific lamprey as part of the on-going project to restore lamprey to various tributaries. CTUIR worked with the Nez Perce and Warm Springs Tribes, and Yakama Nation help with lamprey collection efforts.

THE END

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