2022 Fish Passage Plan

Appendix J

Smolt Monitoring Facility Operating Protocols at Lower Columbia and Lower Snake River Dams

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1. BONNEVILLE DAM JUVENILE MONITORING FACILITY

This Appendix describes operating protocols that will be implemented by agencies conducting research in the Bonneville Dam (BON) Juvenile Monitoring Facility (JMF) to avoid or minimize delayed fish mortality resulting from stress during handling. These protocols were coordinated with fish agencies and tribes in the Fish Passage Operations & Maintenance (FPOM) workgroup.

1.1. General Facility Protocols.

a) Sample rates should not exceed 25% unless collecting research fish when water temperatures are < 70°F.

b) Personnel conducting research or monitoring must be present at the facility to monitor the separator bars for debris and stranded fish.

c) The Corps reserves the right to terminate trapping operations at any time.

d) Project Biologists will use the Corps temperature probe reading as the official temperature. Temperatures are taken in the general holding tank and are both instantaneous readings and 24-hour averages (0000-2400 hours).

1.2. BON JMF Requirements for Users.

All personnel conducting research or monitoring in the JMF will implement the following:

a) Users must have appropriate documentation for conducting research at the dam (see *Guide for Researchers at Bonneville Dam*).

b) Users must have valid State and Federal permits that cover all ESA-listed species that may occur at the project during the collection period. Users shall comply with all permit conditions, even if more restrictive than protocols herein.

c) JMF personnel will be trained in the proper operation of the JMF to insure fish and personnel safety. Users may request training through the Project Biologists.

d) Hard hats worn outside at all times.

e) Long pants or raingear worn at all times. Shorts not permitted in the lab.

f) Steel-toed shoes or rubber boots worn at all times. Tennis shoes or sandals not permitted.

g) If JMF users supply the Project Biologists with a season schedule, it will not be necessary to notify Project Biologists upon arrival and departure.

h) Users may coordinate sample rates with Smolt Monitoring Program (SMP) personnel.

i) Users are permitted to routinely operate flushing valves, fish lifts, and release pipes/valves within the monitoring building.

j) Any modifications to the building or equipment will first be approved by Bonneville Project through Project Fisheries.

k) All anesthetic water will be emptied into the sewage lift station after running through the activated charcoal filters.

l) Project Biologists will operate the upper switchgate at the start and end of each season. Users may operate the upper switchgate as necessary when separator bar monitoring is not available.

m) The lower switchgate is in automatic control. Users will monitor and report to Project biologists any problems with the lower switchgate.

n) On seasonal ascending tailwater elevations, the transition from low to high outfall should be between tailwater elevations at the upper end of 16' to 18' range.

o) On seasonal descending tailwater elevations, the transition from high to low outfall should be between tailwater elevations at the lower end of 18' to 16' range.

p) Avian cannons will be operated 24 hours per day from March 1 through November 1.

q) Project operators and mechanics are responsible for starting/stopping avian cannons.

1.3. BON JMF Sample Mode Operations (typically Fish Passage Season Mar 1 – Nov 30).

a) Smolt monitoring personnel will operate the sampling facility as part of the SMP and to collect fish for regionally approved research.

b) Research updates and equipment or sampling trouble reports will go through Project Biologists to FPOM.

c) JMF personnel will monitor the JMF continuously while in sample mode to ensure proper functioning and to provide quick response to an emergency while JMF is in sample operation.

d) JMF personnel will perform a walk-through inspection of the entire facility (except the 2-mile transport flume) every two hours to ensure safe fish passage conditions.

e) During August, avian cannons may be shut off if Project Biologists observe no predatory birds at the outfall and coordinate through FPOM.

f) To prevent injury and/or mortality to passing fish, particular attention will be paid to the following: dewatering facilities including the PDS, SDS, PDS screen cleaner system, adult transport flume, juvenile hopper, all valves and auxiliary water systems, flushing water systems and their perforated plates, all gates including switch and diverter gates, PIT-tag detectors, and all monitoring building systems including holding tanks, valves and conduits.

g) JMF personnel will observe video monitors at least every $^{1}/_{2}$ hour or continuously, and manually inspect every 2 hours or more frequently according to trash sweep operation or other debris potential.

h) JMF personnel shall monitor kelt passage over the separator.

1.4. BON JMF Sampling at Water Temperature > 70°F.

a) Daily average river temperatures will be obtained from the Corps website for Lower Columbia River projects[1]. Project Fisheries will use the Project thermometer in the sample holding tank for official reporting requirements, instantaneous temperatures and when online data are unavailable.

b) Daily index sampling will be reduced to every-other-day index/condition monitoring.

c) The upper switchgate is used to select between sample and bypass mode.

d) Sample sizes will be reduced to approximately 100 fish per day.

e) Monitoring for gas bubble trauma (GBT) symptoms will continue.

f) An instantaneous temperature of ≥ 70°F taken from 0630–0700 hours will trigger a change in sampling mode after Project Fisheries notify SMP Biologists.

g) Normal index sampling may resume when daily average temperatures are ≤ 69.5°F.

h) If there is a research need to sample at temperatures > 70°F, coordination with FPOM will be initiated by the researcher through the Corps District POC.

i) If SMP and Project Fisheries biologists suspect a bypass system problem during high temperature sampling, additional sample collection may occur. FPOM will be notified ASAP and provided with updates as problem resolution attempts proceed.

1.5. BON JMF Bypass Mode Operation (or when no PDS Monitors).

a) The upper switchgate will be in bypass mode.

b) The Emergency fish release valve will be open.

c) All rotating gates will be set to bypass.

d) The bypass flume gate will be raised.

e) Project Biologists will inspect the facility daily.

1.6. BON JMF System Failure Protocols.

a) Any system failure or abnormality will be reported to a Project Biologist immediately. If a Project Biologist is unavailable, the control room will be contacted at ext. 2221 or 2222.

b) If a high or low water situation occurs in the PDS area, operate as follows:

i) Contact the control room immediately.

ii) Switch the upper switchgate to bypass mode until the problem is corrected.

iii) Immediately open the emergency fish release valve.

iv) Raise bypass flume gate. *DO NOT ADJUST ANY WEIRS***.**

[1] Corps temperature data for Lower Columbia River projects: pweb.crohms.org/tmt/documents/ops/temp/

c) If a monitoring facility failure occurs, operate as follows:

i) Open the emergency fish release valve.

ii) Switch the upper switchgate to bypass mode until the problem is corrected.

iii) Raise the bypass flume gate.

iv) Begin fish salvage operations.

d) If a lower switchgate failure occurs and releases are sent to the wrong high or low outfall, and repairs cannot be made within 24 hours, a special operation will be coordinated via FPOM.

e) In the event of a problem with either the 2-way or 3-way rotating gates (e.g., stuck open or partially open), the response protocol is as follows:

i) Switch the upper switchgate to bypass.

ii) Open the emergency fish release valve.

iii) Turn off air to rotating gate and manually rotate half-round pipe section to bypass position.

iv) Inspect the affected areas for stranded fish and return them to the flume. *Dead fish should be held in a bucket for processing by research personnel.*

v) Contact the Project Biologist, or if that is not possible, the control room operator. Project personnel will request maintenance crews. Repairs should commence within 4 hours of discovering the problem.

f) Once all fish safety issues have been addressed and repairs requested, document the problem in an e-mail to Project Biologists prior to sending to other interested parties.

2. JOHN DAY DAM SMOLT MONITORING FACILITY

The following protocols will be implemented by agencies conducting research in the John Day Dam (JDA) Smolt Monitoring Facility (SMF) as precautionary measures to avoid or minimize delayed fish mortality resulting from stress during handling. These protocols were coordinated with fish agencies and tribes in the Fish Passage Operations & Maintenance (FPOM) workgroup.

2.1. General Facility Protocols.

a) Sample rates should not exceed 25% unless collecting research fish at water temperatures below 70°F.

a) The Corps reserves the right to terminate trapping operations at any time.

2.2. JDA SMF Requirements for Users.

All personnel conducting research or monitoring in the JDA SMF will implement the following:

a) Users must have appropriate documentation for conducting research at the dam (see *Guide for Researchers at John Day Dam*).

b) Users must have valid State and Federal permits that cover all ESA-listed species that may occur at the project during the collection period. Users shall comply with all permit conditions, even if more restrictive than protocols herein.

c) Hard hats are to be worn outside at all times.

d) Long pants or raingear worn at all times. No shorts or sweats permitted.

e) Steel-toed shoes or rubber boots worn at all times. No tennis shoes, sandals permitted.

f) If users provide Project Biologists with a schedule, it will not be necessary to notify Project Biologists upon arrival and departure.

g) Users may coordinate sample rates with Smolt Monitoring Program (SMP) personnel.

h) Users are permitted to routinely operate SMF flushing valves and release pipes/valves.

i) Any modifications to the building or equipment will first be approved by The Dalles/John Day/Willow Creek Project through Project Fisheries.

j) All anesthetic water will be emptied into the activated charcoal filters tanks.

2.3. JDA SMF Sample Mode Operations (typically Fish Passage Season Apr 1 – Sep 15).

a) Smolt monitoring personnel will operate the facility as part of Condition Monitoring at John Day Dam.

b) Condition monitoring sampling will occur Monday through Friday (5 days/week) during the spring, April 1–June 15, and Monday, Wednesday, and Friday (3 days/week) after the end of spring spill (June 16–September 15), except during warm water conditions described below.

c) Research updates and trouble reports will go through Project Biologists to FPOM.

2.4. JDA SMF Sampling at Water Temperatures > 70°F.

a) Daily average river temperatures will be obtained from the Corps website for Lower Columbia River projects[1]. Project Fisheries will use the Project thermometer in the sample holding tank for official reporting requirements, instantaneous temperatures, and when online data are unavailable.

b) 24-hour index sampling will be reduced to twice per week (preferably Mondays and Thursdays) condition monitoring from 0700–1300 hours.

c) The switchgate is used to select between sample and bypass mode.

d) Sample sizes will be reduced to approximately 100 fish per day.

e) An instantaneous temperature of ≥ 70°F taken between 0630–0700 hours will trigger a change in sampling mode after Project Fisheries notifies SMP Biologists.

f) Normal index sampling may resume when daily average temperatures are ≤ 69.5°F.

g) If there is a research need to sample at temperatures > 70°F, coordination with FPOM will be initiated by the researcher through the Corps District POC.

h) If the SMP and Project Fisheries biologists suspect a bypass system problem during a high temperature sampling period, additional sample collection may occur. FPOM will be notified ASAP and provided with updates as problem resolution attempts proceed.

2.5. JDA SMF Bypass Mode Operation.

a) All rotating gates will be set to bypass.

b) Project Biologists will inspect the facility every two hours.

c) If the full-flow PIT-tag detector is effective, the switch gate will be moved to bypass.

2.6. JDA SMF System Failure Protocols.

a) Any system failure or abnormality will be reported to a Project Biologist immediately. If a Project Biologist is unavailable, the control room will be contacted at ext. 4211.

b) In the event of a problem with either the 2-way or 3-way rotating gates (e.g., stuck open or partially open), the response protocol is as follows:

i) Contact the Project Biologist, or if unavailable, the control room. Project personnel (SMF Biologist) will request maintenance crews. Repairs should commence within 4 hours of discovering the problem.

ii) Once all fish safety issues have been addressed and repairs requested, document the problem in an e-mail to Project Biologists prior to sending to other parties.

3. McNARY DAM JUVENILE FISH FACILITY

Agencies conducting research in the McNary Dam (MCN) Juvenile Fish Facility (JFF) will implement the following protocols as precautionary measures to avoid or minimize delayed fish mortality resulting from stress during handling. The Fish Passage Operations & Maintenance (FPOM) workgroup coordinated these protocols with fish agencies and tribes.

3.1. General Facility Protocols.

a) Sample rates should not exceed 25% unless collecting research fish at water temperatures < 68.0°F.

b) The Corps reserves the right to terminate trapping operations at any time.

3.2. MCN JFF Requirements for Users.

All personnel conducting research or monitoring in the MCN JFF shall:

a) Have appropriate documentation for conducting research at the dam.

b) Have valid State and Federal permits that cover all ESA-listed species that may occur at the project during the collection period.

c) Comply with all permit conditions, even if more restrictive than protocols herein.

d) Always wear hard hats when outside, in, under, or around the JFF or the dam.

e) Always wear long pants or raingear. No shorts or sweats permitted.

f) Always wear steel-toed shoes (or rubber boots when likely to enter water). No tennis shoes or sandals permitted.

g) If users provide the project biologists with a schedule, it will not be necessary to notify them upon arrival and departure.

h) Users shall coordinate sample rates with Smolt Monitoring Program (SMP) or MCN project biologists.

i) Users are not permitted to routinely operate JFF flushing valves and release pipes/valves without the permission of project biologists.

j) The Project Biologist must approve any proposed modifications to the building or equipment.

3.3. MCN JFF Sample Mode Operations (typically April 6 – September 30).

3.3.1. Sampling Procedures.

a) *In 2022, the McNary bypass system will begin operations March 1 and screens will be installed in at least the first three available priority units. Additional units may be screened before April 6 if maintenance schedules allow. Sampling during the early start-up will occur every other day.*

b) Personnel will normally conduct sampling in accordance with smolt monitoring program guidelines recommended by the PSMFC. Project and SMP personnel may occasionally alter sampling guidelines if fish research activities require it. Normal

alterations of sampling guidelines are to adjust the number of fish sampled to meet approved research needs or to minimize the handling of fish during warm water temperature periods.

c) Electronic counting tunnels count sampled fish and staff verify and adjust the counts by hand counts. Staff will base all fish number estimates and rates on the size of the sample of fish collected. Staff will take samples hourly for 24-hours every-other-day. Project biologists will coordinate with SMP personnel to set sample rates.

d) SMP and project personnel will take and use species composition and weight samples to determine loading densities for raceways (if fish are being collected for research needs). Project personnel will keep a running total of hourly estimates of fish numbers and raceway totals. Samples for monitoring descaling will include a minimum of 100 fish of the predominant group(s) for which descaling information is recorded. SMP and project staff will monitor descaling every-other-day for facility operations. SMP and project personnel may conduct full sample descaling instead of 100 fish subsamples if it does not adversely affect other facility operations.

e) Where SMP activities are conducted at collector dams, project biologists may utilize daily total information gathered by those personnel.

f) Research updates and trouble reports will go through project biologists to FPOM.

3.4. MCN JFF Sampling at Water Temperatures > 68.0°F.

a) Personnel will obtain daily average river temperatures from the Corps website at: www.nwd-wc.usace.army.mil/ftppub/water_quality/tempstrings/.

b) Staff will conduct daily 24-hour index sampling every-other-day, 0700–0700 hours. If juvenile salmonid populations experience high mortality after personnel implement the above procedures, the project will cease fish collection for regular sampling, but SMP and project staff shall continue to collect for fish condition sampling for up to 8 hours per day.

c) The switchgate selects between sample and bypass mode.

d) If populations experience high mortality, staff will reduce sample sizes to approximately 100 fish per day, within sampling limitations.

e) Project or SMP personnel will use a thermometer in the sample holding tank for official reporting requirements, instantaneous temperatures or when online data are unavailable.

f) An instantaneous temperature of 68.0°F or greater taken between 0630 and 0700 hours will trigger a change in sampling mode after a project biologist notifies SMP biologists.

g) Normal index sampling may resume when daily average temperatures are ≤ 68.0°F.[1]

h) If there is a research need to sample at temperatures >68.0°F, the Corps District POC will initiate coordination with FPOM.

i) If the SMP and project fisheries biologists suspect a bypass system problem during a high temperature sampling period, additional sample collection may occur. Project or

District biologists will notify FPOM as soon as possible and provide updates as they attempt to resolve the problem.

j) For additional measures to take when sampling at water temperatures above 68.0°F, see **FPP Chapter 5 - McNary Dam**.

3.5. MCN JFF Bypass Mode Operation.

a) Project personnel will set the switchgate to the appropriate bypass mode.

b) Project personnel will inspect the facility as necessary.

3.6. MCN JFF System Failure Protocols.

a) Personnel shall immediately report any system failure or abnormality to a project biologist, or if unavailable, the control room at ext. 231.

4. ICE HARBOR DAM JUVENILE FISH FACILITY

Agencies conducting research in the Ice Harbor (IHR) Juvenile Fish Facility (JFF) will implement the following protocols as precautionary measures to avoid or minimize delayed fish mortality resulting from stress during handling. The Fish Passage Operations & Maintenance (FPOM) workgroup coordinated these protocols with fish agencies and tribes.

4.1. IHR JFF Sampling at Water Temperature > 70.0°F.

a) An instantaneous sample/holding temperature of 70.0°F or greater taken within the JFF between 0630 and 0700 hours will trigger the suspension of condition sampling at IHR. The Project biologist will notify condition monitoring personnel when this has occurred.

b) Condition sampling at IHR may resume if/when the instantaneous sample/holding temperature taken within the JFF between 0630 and 0700 is ≤ 70.0°F.

c) If there is a research need to sample at temperatures > 70.0°F, the Corps District POC will initiate coordination with FPOM.

d) If the condition monitoring or project biologists suspect a bypass system problem during a high temperature sampling period, additional sample collection may occur. Project or District biologists will notify FPOM as soon as possible and provide updates as they attempt to resolve the problem.

5. LOWER MONUMENTAL DAM JUVENILE FISH FACILITIES

Agencies conducting research in the Lower Monumental (LMN) Juvenile Fish Facilities (JFF) will implement the following protocols as precautionary measures to avoid or minimize delayed fish mortality resulting from stress during handling. The Fish Passage Operations & Maintenance (FPOM) workgroup coordinated these protocols with fish agencies and tribes.

5.1. LMN Sampling.

a) Condition samples will be taken if fish are being sampled for barge transport loading purposes (see **Appendix B**); the following criteria will apply when barge transport samples are not taken for any reason.

b) Condition sampling will begin April 1 to monitor descaling and other fish condition parameters and to ensure sampling systems are operating correctly prior to transport. From April 1 through April 14, condition sampling will occur at least twice per week, with no more than three days between samples.

c) From April 15 through July 31, condition sampling will occur every other day.

d) From August 1 through September 30, condition sampling will occur at least twice per week with no more than three days between samples.

e) The sample goal should be 100 fish of the predominant salmonid species.

f) Sampling frequency may be increased if injuries are observed or suspected (e.g., during high debris conditions).

g) Full 24-hour samples may be taken to determine species composition to inform a decision on starting transport at this project.

h) Fish condition reporting will follow the standardized SMP protocol and sent to FPC within 12 hours of sampling.

i) When not condition sampling, the JFF will return to primary (full-flow) bypass and juvenile fish will be routed to the primary outfall and full-flow PIT-tag detection system.

5.2. LMN Sampling at Water Temperature > 68.0°F

a) An instantaneous sample/holding temperature of 68.0°F or greater taken within the JFF between 0630 and 0700 hours will trigger the following changes in sampling after a project biologist notifies SMP biologists:

i) If transportation <u>is not</u> occurring, daily index sampling will be reduced to every-other-day index/condition monitoring. Daily sampling may resume up to 3 days prior to beginning fish transport to estimate loading densities.

ii) If transportation <u>is</u> occurring, daily index sampling will continue but sample rates will be reduced to target approximately 100 fish per day.

iii) Monitoring for gas bubble trauma (GBT) will continue (where/when applicable).

b) Normal index sampling may resume when the instantaneous sample/holding temperature taken within the JFF between 0630 and 0700 is ≤ 67.5°F.

c) If there is a research need to sample at temperatures > 68.0°F, the Corps District POC will initiate coordination with FPOM.

d) If the SMP or project biologists suspect a bypass system problem during a high temperature sampling period, additional sample collection may occur. Project or District biologists will notify FPOM as soon as possible and provide updates as they attempt to resolve the problem.

6. LITTLE GOOSE DAM JUVENILE FISH FACILITIES

Agencies conducting research in the Little Goose (LGS) Juvenile Fish Facilities (JFF) will implement the following protocols as precautionary measures to avoid or minimize delayed fish mortality resulting from stress during handling. The Fish Passage Operations & Maintenance (FPOM) workgroup coordinated these protocols with fish agencies and tribes.

6.1. LGS Sampling.

a) From April 1 until the start of transport (see **Appendix B**), condition sampling will occur every other day to monitor descaling and other fish condition parameters, to ensure sampling systems are operating correctly prior to transport, and to train personnel on facility operations and sampling protocol.

b) The sample goal should be 100 fish of the predominant salmonid species.

c) Sampling frequency may be increased if injuries are observed or suspected (e.g., during high debris conditions).

d) Full 24-hour samples may be taken to determine species composition to inform a decision on starting transport at this project.

e) Fish condition reporting will follow the standardized SMP protocol and sent to FPC within 12 hours of sampling.

f) When not sampling, the facility will return to primary (full-flow) bypass and juvenile fish will be routed to the mid-river outfall and full flow PIT-tag detection system.

6.2. LGS Sampling at Water Temperature > 68.0°F

a) An instantaneous sample/holding temperature of 68.0°F or greater taken within the JFF between 0630 and 0700 hours will trigger the following changes in sampling after a project biologist notifies SMP biologists:

i) If transportation <u>is not</u> occurring, daily index sampling will be reduced to every-other-day index/condition monitoring. Daily sampling may resume up to 3 days prior to beginning fish transport to estimate loading densities.

ii) If transportation <u>is</u> occurring, daily index sampling will continue but sample rates will be reduced to target approximately 100 fish per day.

iii) Monitoring for gas bubble trauma (GBT) will continue (where/when applicable).

b) Normal index sampling may resume when the instantaneous sample/holding temperature taken within the JFF between 0630 and 0700 is ≤ 67.5°F.

c) If there is a research need to sample at temperatures > 68.0°F, the Corps District POC will initiate coordination with FPOM.

d) If the SMP or project biologists suspect a bypass system problem during a high temperature sampling period, additional sample collection may occur. Project or District biologists will notify FPOM as soon as possible and provide updates as they attempt to resolve the problem.

7. LOWER GRANITE DAM JUVENILE FISH FACILITIES

Agencies conducting research in the Lower Granite (LWG) Juvenile Fish Facilities (JFF) will implement the following protocols as precautionary measures to avoid or minimize delayed fish mortality resulting from stress during handling. The Fish Passage Operations & Maintenance (FPOM) workgroup coordinated these protocols with fish agencies and tribes.

7.1. LWG Sampling.

a) Normal 24-hour sampling for the SMP shall occur.

b) When not sampling, juvenile fish will be bypassed via normal separator operations and routed to the mid-river release outfall and PIT-tag detection system.

7.2. LWG Sampling at Water Temperature > 68.0°F

a) An instantaneous sample/holding temperature of 68.0°F or greater taken within the JFF between 0630 and 0700 hours will trigger the following changes in sampling after a project biologist notifies SMP biologists:

i) If transportation <u>is not</u> occurring, daily index sampling will be reduced to every-other-day index/condition monitoring. Daily sampling may resume up to 3 days prior to beginning fish transport to estimate loading densities.

ii) If transportation <u>is</u> occurring, daily index sampling will continue but sample rates will be reduced to target approximately 100 fish per day.

iii) Monitoring for gas bubble trauma (GBT) will continue (where/when applicable).

b) Normal index sampling may resume when the instantaneous sample/holding temperature taken within the JFF between 0630 and 0700 is ≤ 67.5°F.

c) If there is a research need to sample at temperatures > 68.0°F, the Corps District POC will initiate coordination with FPOM.

d) If the SMP or project biologists suspect a bypass system problem during a high temperature sampling period, additional sample collection may occur. Project or District biologists will notify FPOM as soon as possible and provide updates as they attempt to resolve the problem.