

**APPENDIX B**

**CORPS OF ENGINEERS JUVENILE**

**FISH TRANSPORTATION PLAN**

## Corps of Engineers' Juvenile Fish Transportation Plan

### 1. Introduction:

a. The Juvenile Fish Transportation Plan describes operations and establishes criteria for the transportation of juvenile salmon and steelhead from Lower Granite, Little Goose, Lower Monumental, and McNary dams (collector dams) to release areas below Bonneville Dam. This work plan supplements normal operating criteria presented Sections 5,6,8, and 9 of the Fish Passage Plan for the collector dams.

b. Collection and transportation is accomplished by the Walla District, Corps of Engineers (CENWW), under an Endangered Species Act (ESA) permit from the National Marine Fisheries Service (NOAA Fisheries). On-site biological assistance is provided by fishery agencies through a contract with Pacific States Marine Fisheries Commission and subcontracts with Washington Department of Fish and Wildlife (WDFW) and Oregon Department of Fish and Wildlife (ODFW). On-site biological assistance is provided by WDFW at Lower Granite, Lower Monumental, and McNary dams and ODFW at Little Goose Dam.

c. The transport program will be coordinated with other fishery monitoring, research, and management activities by CENWW. Coordination will be achieved with the fishery agencies and tribes through NOAA Fisheries, the Fish Passage Center (FPC), Fish Passage Operations and Maintenance Coordination Team (FPOM), the Technical Management Team (TMT), and other agencies as required.

**2. Objective:** The objective of CENWW and the transportation program is to maximize survival of juvenile fish collected and transported by:

a. Providing safe and efficient collection and barge or truck transport of juvenile salmon and steelhead from collector dams to release areas below Bonneville Dam;

b. Identifying and recommending programs or facility changes that would benefit fish collection and transportation or bypass operations;

c. Assuring that collection, transport, and release site facilities are ready for operation prior to the beginning of transport operations;

d. Assuring that collection, transport, and release site facilities are properly maintained throughout the transport season;

e. Establishing operating criteria for facilities, barges, and trucks including fish holding and transport densities, sampling rates, and facility operations and maintenance;

f. Coordinating changes needed to accommodate fluctuations in the outmigration with projects, NOAA Fisheries, FPC, FPOM, and TMT personnel;

g. Coordinating transport evaluation and other research with the transportation program;

h. Providing the training of new personnel associated with collection and transport facilities and equipment;

i. Providing all parties involved a list of emergency points of contact and appropriate telephone numbers so that any emergency can be coordinated and corrected efficiently;

j. Preparing an annual report detailing transportation activities and results for the previous year, and identifying maintenance, replacement, or modifications needed for the next transport season.

### **3. Program Duration:**

a. Starting Operations: Transport operations will start on March 25 at Lower Granite Dam. Collection of juvenile fish for transportation at Little Goose and Lower Monumental dams will begin on April 1. McNary Dam will begin sampling for PIT tags, monitoring facility operations, and the Smolt Monitoring Program on April 1. Transport operations at McNary Dam will not begin until conditions specified under paragraph 4.a.(2) are met.

b. Summer Transport Operations: At McNary Dam, summer operations will begin when in-river migration conditions are no longer spring-like (see 4.a.(2) below). At Lower Granite, Little Goose, and Lower Monumental dams, summer operations will begin on June 21. Fish collected during summer operations will be held in shaded raceways or holding tanks. Sampling may convert to 100% when fish numbers at Snake River projects are below 500 fish per day or lower (per FPC sampling guidelines) and smaller pickup mounted transport tanks may be used. Steelhead, which state biologists determine are in poor condition or are reverting to the parr stage, may be bypassed to the river.

c. Ending Operations: Transport operations are anticipated to continue through approximately October 31 at Lower Granite and Little Goose, and through September 30 at Lower Monumental and McNary dams.

d. Emergency Notification Criteria: Project Biologists will report to the CENWW Transportation Coordinator when high water temperatures or other factors increase collection mortality to 6 percent of daily collection for 3 consecutive days or if daily collection mortality exceeds 10,000 fish. The Transportation Coordinator will evaluate the situation and shall notify NOAA Fisheries and may arrange a conference call, if needed, with FPC and/or TMT to discuss the options of continuing collection and transportation or to bypass fish. In the event of a fish loss exceeding conditions set forth in the ESA Section 10 Permit for the transportation program, the Corps shall notify NOAA Fisheries and reopen consultation as needed. If icing conditions threaten facility integrity or present unsafe conditions on the transport route, transport operations may be terminated early by the Project Manager. Emergency termination or modification of the transportation program will be coordinated by the CENWW Transportation Coordinator with NOAA Fisheries and FPC.

#### **4. Operating Criteria:**

a. Collection and Transportation: Juvenile fish shall be transported in accordance with the ESA Section 10 permit, the Biological Opinion prepared under ESA Section 7 consultation with NOAA Fisheries, and transportation program criteria. During transport operations, collected juvenile fish will be bypassed back to the river if the number of collected fish exceeds facility and barge holding capacities. Holding for transportation will resume when adequate capacities are available to hold and transport fish according to transportation program criteria. Maximum holding time and loading criteria will not be exceeded without CENWW review and approval. Marked or PIT tagged fish will be released to the river if they are part of an approved research study or smolt monitoring program travel time evaluation. Specifics of the transportation program may be altered during the transportation season based on recommendations from the TMT.

(1) At Lower Granite, Little Goose, and Lower Monumental dams, all juvenile fish collected shall be transported. Barging operations will begin on April 9 and continue through approximately August 15.

(2) At McNary Dam, fish collected during the spring shall be bypassed back to the river either through the main bypass pipe and full flow PIT tag detection system or through the transportation facilities in order to collect fish for transport research, fish condition information, and to obtain PIT tag data. The preferred operation when not collecting spring fish for transport research is full flow bypass to the river. Full flow

bypass may be alternated with every other day bypass through the transportation facilities to allow sampling of fish under the Smolt Monitoring Program. Transportation operations at McNary Dam for subyearling chinook shall not begin until inriver migratory conditions are deteriorating (i.e., no longer spring-like), usually not until around June 20. Spring-like conditions are defined as favorable flow and water temperatures; i.e., river flows are at or above the spring flow target of 220 to 260 kcfs, and ambient water temperatures are below 62°F. When transport operations begin, fish will be collected and held for transportation with all fish collected being transported. During the spring, juvenile fish may be periodically sampled for the Smolt Monitoring Program and for monitoring facility operations.

b. Peak Migration Periods: For the purpose of transport operations, the peak migration period is defined as beginning when total collection at an individual project reaches 20,000 fish per day (actual peak days may range from 250,000 to 830,000 fish per day). Normally, truck transportation will be used before and after the peak, and barge transportation will be used during the peak. Peak migration generally occurs between April 15 and June 10 at Lower Granite, Little Goose, Lower Monumental, and McNary dams. At McNary Dam, a summer peak of subyearling chinook salmon also occurs from late June through mid-August with a smaller peak occurring during this time period at Snake River projects

c. Collection Facility Operations:

(1) Once transport operations begin, collection facilities will be staffed 24 hours per day until transport operations cease.

(2) Flows and fish passage at juvenile fish separators will be monitored at least every 15 minutes throughout separator operations.

(3) When collection systems are not providing safe fish passage or meeting operating criteria, project managers and biologists will make operational changes that are in the best interests of the fish, then notify CENWW as soon as possible. The CENWW Transportation Coordinator will coordinate changes with NOAA Fisheries, FPC, and TMT.

d. Sampling Procedures:

(1) When sampling is being conducted, it will normally be accomplished in accordance with smolt monitoring program sampling guidelines recommended by the FPC. Sampling guidelines may occasionally be altered if transportation program or fish

research activities require it. Normal alterations of sampling guidelines are to adjust the number of fish sampled to meet approved research needs, to minimize the handling of fish during warm water temperature periods, or to meet deadlines for loading fish transport vehicles.

(2) Fish that are sampled will be counted by electronic counting tunnels and the counts verified and adjusted by hand counts. All fish number estimates, raceway, truck, and barge loading densities and rates will be based on a sample of fish collected. Samples will be taken hourly 24 hours per day. Sample rates will be coordinated with smolt monitoring program personnel and set by project biologists.

(3) Species composition and weight samples will be taken to determine loading densities for raceways, barges, and trucks. Project personnel will keep a running total of hourly estimates of fish numbers, raceway totals, and direct loading totals for barges based on these estimates. Daily samples for monitoring descaling will include a minimum of 100 fish of the dominant group(s) for which descaling information is recorded. During periods of low fish passage, descaling will be monitored daily for facility operations. Full sample descaling may be conducted instead of 100 fish subsamples as long as it does not impact other facility operations. During extended transport operations (after August 15 at Snake River projects), samples may be evaluated every other day to minimize handling stress and to allow all collected fish to be held in the sample holding tanks.

(4) Where smolt monitoring program activities are conducted at collector dams, project biologists may utilize daily total information gathered by those personnel.

e. Loading Criteria:

(1) Raceways: Maximum raceway holding capacity will be 0.5 lbs. of fish per gallon of water. Inflow to raceways is approximately 1,200 gallons per minute (gpm) at Lower Granite and Little Goose dams, and 2,400 gpm at Lower Monumental and McNary dams. Individual raceway volume is approximately 12,000 gallons of water at Lower Granite and Little Goose, and 24,000 gallons at Lower Monumental and McNary.

(2) The 0.5 pounds per gallon criterion is not to be exceeded without CENWW review and approval. Such decisions will be coordinated with NOAA Fisheries, FPC, and TMT and a joint decision whether to exceed criteria or bypass fish to the river will be made based on: (1) species composition; (2) total anticipated collection during the critical holding period; (3) in-river fish passage conditions; and (4) fish condition.

Project biologists will provide information to the CENWW Transportation Coordinator upon which to base these decisions.

(3) Distribution Among Raceways: Collected fish should be spread among raceways to minimize crowding and stress, and to reduce the risk of disease transmission. Additional groups should be added to each raceway at the discretion of the project biologist until holding capacity is reached. Whenever possible, small fish will be held in raceways separate from large fish.

(4) Holding Time: Maximum holding time in raceways will be 2 days.

(5) Truck and Barge Capacities: Loading criteria are 5 pounds of fish per gpm inflow for barges and 0.5 pounds of fish per gallon of water for trucks. Capacities per vehicle are shown in Table B-1.

Table B-1. Capacities for fish transport vehicles.

Barge	Capacity (gal)	Inflow(gpm)	Fish Capacity (lbs)
SOCKEYE (2127)	85,000	4,600	23,000
BLUEBACK (2817)	85,000	4,600	23,000
STEELHEAD (4382)	100,000	10,000	50,000
COHO (4394)	100,000	10,000	50,000
CHINOOK (8105)	150,000	15,000	75,000
KING SALMON (8106)	150,000	15,000	75,000
8107	150,000	15,000	75,000
8108	150,000	15,000	75,000
Truck	3,500		1,750
Midi-tank	300		150
Mini-tank	150		75

f. Summer (Extended) Transport Operations:

(1) During the summer, all fish collected at the projects will be routed to the raceways with the most effective shading for holding. Sampling efforts should be minimized, if possible, to limit handling stress on fish. Facility samples may be processed every other day if possible.

(2) At Snake River projects, all collected fish may be routed to the sample tanks when fish numbers drop to an acceptable handling level. At that time all fish collected will be handled as part of the daily sample per smolt monitoring program sampling guidelines. To minimize handling stress, facility samples may be processed every other day. When large trucks are used, fish may be loaded from either the raceways or labs. When mini or midi-tankers are used, Corps and agency

project biologists will select the best method of transferring fish from the lab to the tankers.

(3) During summer months at McNary Dam, from June 15 through August 31, water temperatures will be measured along the face of the powerhouse, in B-slot gatewells, and within the collection channel on a daily basis. These temperature measurements will be used for management of project operations per criteria contained in the Fish Passage Plan. During warm water periods, collected fish may be transported by truck or barge on a daily basis to minimize stress and mortality from warm water conditions. Other special operations may be required at McNary Dam during summer months to minimize impacts of project operations on juvenile fish collection during warm water temperature periods.

(4) During the summer trucking season, if fish collection numbers begin increasing to where it appears the project will have difficulty transporting the fish with available equipment, the project shall notify the CENWW Transportation Coordinator immediately. The Transportation Coordinator will arrange for additional transport vehicle if possible or prioritize transport/bypass operations between the projects.

(5) When water temperatures are above 68<sup>0</sup>F, all personnel handling fish shall take extra care to minimize stress and other impacts on fish.

g. Facility and Equipment Logbooks and Records: To document collection and transportation activities, the following items will be logged at each dam by either project personnel or state biologists:

(1) Juvenile fish facilities: Records will be maintained recording fish counts by hour, by day, and by species, numbers and species of fish trucked or barged, number and species of fish sampled, descaling rates, and mortality rates. Records will be transmitted daily to CENWW for consolidation and transmittal to CENWD. Facility personnel will follow standard operating procedures (SOP's), and will note in facility logbooks accomplishment of SOP's at various stations at the collection facilities. General observations of fish condition and juvenile fish passage will be documented in facility logbooks by state biologists.

(2) Truck and Barge Logbooks: Each truck and barge shall have a logbook for recording fish loading rates, fish condition, estimated mortalities, area of release, equipment malfunctions, and accomplishment of scheduled work under the

SOPs. When consecutive loading of trucks or barges occurs at downstream projects, truck drivers or barge riders will record numbers and condition of fish loaded. Towboat captains will keep logbooks on towboat activities. Barge riders will be authorized as inspectors by the Contracting Officer's Representative to initial entries noting towboat passage, loading, or fish release activities, and comments on barging operations. State biologists will report truck and barge mortality information in their weekly reports.

(3) Weekly Reports: State biologists shall prepare weekly reports documenting daily and weekly collection and transportation numbers, sampling information, facility and sampling mortality, descaling rates, and adult fallbacks. The weekly reports will be used by CENWW for any weekly reports required in the ESA Section 10 permit issued by NOAA Fisheries. State biologists shall distribute the weekly reports to other regionally interested parties as directed by the CENWW Transportation Coordinator.

## **5. Transport Operations:**

a. Truck Operations: Eight fish transport trailers and four tractors, three midi-tanks, and three mini-tanks are available for hauling fish. One midi-tank and one mini-tank will be provided at each Snake River project. Mini-tanks are small units that can be mounted onto pickup trucks. Normally during the early spring trucking, transport trucks/trailers will be distributed two at Lower Granite Dam, one at Little Goose Dam, one at Lower Monumental Dam. During late summer trucking, one truck/trailer will be stationed at each dam. Spare trailers will be kept at McNary Dam. Trucks may be redistributed to meet transport demands and when smaller transport vehicles begin operating in late summer.

(1) Truck Release Sites: The normal early spring release site for trucked fish will be at Dalton Point. From August 15 through the end of the transport season, trucks and mini-tanks will be transported by barge from a boat ramp located somewhere downstream of Bonneville dam to a mid-river release area. Mid-river releasing of trucked fish will continue as long as river levels allow safe loading of trucks onto the barge. Dalton point will be utilized as an alternate release site in the case of an emergency or unsafe river conditions for performing the mid-river barge release.

(2) Operation of Truck Life Support Systems: Truck drivers will be trained by project biologists and maintenance personnel on the operation of truck life support systems, the requirements of fish to be met, and signs of stress for which to

watch. Routine checks will be made on support systems and fish condition at check points identified by project biologists. Life support system data and information on fish condition will be entered into the truck driver's logbook at each check point and at the release point. The truck driver's logbook will be reviewed by the project biologist upon the truck driver's return after each trip.

(3) If required to maintain transport schedules, transport trucks, midi-tanks, and mini-tanks leaving Lower Granite may take on additional fish at Little Goose Dam, or trucks leaving Little Goose may take on additional fish at Lower Monumental Dam. Loading schedules will be coordinated so that fish will be kept separated by size as much as possible.

b. Barge Operations: Eight fish barges and four towboats will be available for use.

(1) Barge Scheduling: Barges with 75,000 pound capacity will operate from Lower Granite Dam. It takes approximately 79 hours to make a trip from Lower Granite Dam to the release area near the Skamania light buoy below Bonneville Dam and return. One barge will leave Lower Granite Dam every-other-day beginning on about April 8. When fish numbers increase, barging operations will switch to one barge leaving Lower Granite daily. When fish numbers decline in late spring, operations will change back to every-other-day barging from Lower Granite Dam, with barging operations continuing through August 15. During spring operations, barges will take on additional fish at Little Goose, and Lower Monumental dams as barge capacity allows. The two medium and two small barges may also be used from Lower Granite Dam for additional barging capacity or they will be used for direct loading of fish at Little Goose Dam. When daily collection exceeds barge capacity, juvenile fish will be bypassed to the river until collection numbers drop to where juvenile fish can be barged within barge carrying capacity criteria. During the summer, barges traveling from the Snake River projects will stop at McNary Dam to load fish collected there. Barging from McNary Dam may continue after Snake River barging ceases, past August 15, on an every-other-day basis if fish numbers warrant it. Summer barge operations at McNary after August 15 will continue while collection exceeds 3,500 pounds of fish per day (the capacity of two trucks) or trends indicate numbers will exceed the 3,500 pound trigger number.

(2) Barge Loading: Whenever possible, small and large fish will be loaded in separate compartments in barges.

(3) Barge Riders: Project barge riders will accompany each barge trip, supervising all loading and release

operations, and barge operations en-route. Barge riders will be trained on barge operation, maintenance, and emergency procedures by project biologists and maintenance personnel. Barge riders will also be cross-trained in facility operations, and may rotate with facility operators as decided by project management. Barge riders shall be responsible for monitoring fish condition, barge equipment operations, and water quality (temperature and dissolved oxygen levels) at regular intervals during downriver trips. Barge riders shall maintain logbooks recording loading activities and times, loading densities by barge compartment, information on equipment operations, and release locations. Standard operational procedure forms shall be filled out during routine monitoring of equipment operation and shall include fish mortality and water quality data. At each subsequent dam where fish are loaded onto the barge, the barge rider shall make appropriate notations in the logbook. The barge rider shall also serve as an inspector for the towboat contract, and record information required by the Contracting Officer's Representative, and shall initial the towboat captain's logbook confirming operational information and lockage times. Any unresolved differences between barge riders and towboat crews shall be reported immediately to the Contracting Officer's Representative.

(4) Barge Release Area: The barge schedule is based on release at the Skamania light buoy (approximately RM 140) with arrival at that point pre-determined to occur during night-time hours to minimize predation impacts. Barge travel time is affected by weather and river flows. As allowed by arrival time at Bonneville Dam, barge riders will randomly select barge release sites from Skamania light buoy upstream to Warrendale (approximately RM 144) to further decrease the ability of predators to prey on fish released from the barge. Project biologists will provide maps designating specific release sights to ensure that fish will not be released in the same area on consecutive trips.

## **6. Emergency Procedures:**

a. Emergency procedures will be followed at any time an emergency occurs, 24 hours per day, 7 days per week during the transport season. Emergencies will be reported to the CENWW Transportation Coordinator as soon as possible.

b. In the event of an emergency (equipment failure at a facility or on a truck or barge, emergency lock outage, chemical spill in the river, etc.), facility workers, truck drivers, and barge riders will be expected to take immediate appropriate actions to protect fish. If time allows, the worker, driver, or rider should consult with his/her supervisor by phone or radio to jointly make emergency decisions. If time does not allow

consultation, the worker, driver, or rider must take appropriate action on his/her own initiative, then report to his/her supervisor as soon as possible after the action has been completed.

c. A complete listing of persons to be notified in case of emergencies and their business and home telephone numbers will be provided to each person involved in the transport program. Facility operators, truck drivers, and barge riders will be trained on emergency notification procedures by project biologists and CENWW. For the purpose of reporting an emergency, the person involved will immediately notify his/her supervisor, or the next person up the line until the emergency has been properly reported and corrective action has been initiated. In addition to telephone reporting, barge riders will report emergencies by the towboat radio to the nearest Corps dam. The operator on duty will relay the message to the person or persons identified by the barge rider.

## **7. Fishery Agency Roles:**

a. The fishery agencies provide biological assistance at transportation dams. CENWW contracts for state fish biologists to work at each collector facility.

b. Contracts specify that state agency personnel at collector dams accomplish specific tasks for the Corps including:

(1) Reviewing or conducting handling, inspection, and recording of data from fish sampled at the collection facility;

(2) Evaluating and recording fish condition, and recommending operational changes or inspection of facilities if fish condition indicates a problem;

(3) Providing hand counts of sampled fish, assisting the project biologist in adjusting electronic fish counts, checking hourly and daily fish counts for accuracy, and coordinating facility counts with counts of FPC smolt monitoring program personnel where appropriate;

(4) Conducting quality control inspections of collection facilities and transport equipment including visits to other collection facilities when work schedules can be so arranged;

(5) Monitoring the effects of smolt monitoring and research projects on fish condition and transportation activities and reporting impacts, including numbers of fish handled for

research purposes and the disposition of those fish, to the project biologist;

(6) Participating in gatewell dipping as required to monitor fish condition;

(7) Preparing weekly reports summarizing fish numbers and transport activities, and;

(8) Preparing text and tabular information in the correct format for project annual reports.

#### **8. Dissemination of Information:**

a. Project biologists or agency biologists at each collector dam will be responsible for entering all pertinent information into the computer database and for transmitting daily reports to CENWW. Weekday information will be transmitted by 1500 hours on the day collected. Weekend information will be transmitted to CENWW by 1200 hours on the following Monday.

b. Agency biologists will provide weekly reports detailing fish collection and transportation numbers, descaling estimates, and facility and transportation mortality estimates. The reports will also contain a narrative on project activities and compliance with operating criteria. If research or smolt monitoring activities are occurring at the project, the weekly reports will include information on the number of fish sampled and sacrificed also. Agency biologists shall provide the reports to interested parties within the region.

#### **9. Project Requirements for Fishery Agency Activities and Research:**

a. Coordination: Agencies and tribes expecting to work at Corps dams will provide early coordination including work proposals, evidence of approval by CBFWA, copies of ESA permits, and project needs and requirements through written correspondence to the Chief, Operations Division, of CENWW, and shall not start work until written approval has been received. The Corps also expects the FPC to coordinate Smolt Monitoring Program sampling guidelines with the Corps on an annual basis.

b. Protocol: To maintain good working relationships and safe working conditions, fishery agencies, tribes, and research organizations will be required to follow courtesy, security, and safety protocols as follows.

(1) Have agency picture identification and present it to project security on arrival;

(2) Check in with the Operations Manager upon first arrival at the project to receive information on who will be the project point of contact, and what courtesy and safety requirements must be followed;

(3) Notify the point of contact whenever arriving or departing from the project so they will know where personnel will be working and when they will be on the project;

(4) Adhere to project clearance, safety, security, and work procedures, including preparing an Activity Hazard Analysis as specified in the Corps Safety Manual, 385-1-1.;

(5) Notify the Operations Manager or his/her representative of unscheduled or non-routine work and activities, and;

(6) Notify the point of contact of expected guests or changes in personnel and assure that these individuals are aware of safety and work procedures.