Exhibit D: ENGINEERING DESIGNS 1

MIDDLE FORK COQUILLE RIVER FISH PASSAGE

DOUGLAS COUNTY, OR

FINAL DESIGN

PROJECT PARTNERS

Oregon Department of Transportation

SPECIAL APPRECIATION GOES TO THE COQUILLE INDIAN TRIBE, COW CREEK BAND OF UMPQUA TRIBE OF INDIANS, AND SHASTA GROUP FOR THEIR ASSISTANCE AND SUPPORT.

PROJECT DESCRIPTION

THIS PROJECT INTENDS TO PROVIDE VOLITIONAL FISH PASSAGE FOR JUVENILE AND ADULT SALMONIDS, AS WELL AS OTHER NATIVE FISH, AND MAXIMIZE NATURAL RIVER PROCESSES. FISH PASSAGE IS CURRENTLY HINDERED BY LARGE BOULDERS IN THE CHANNEL. SELECTED BOULDERS WILL BE REDUCED, RELOCATED AND/OR REMOVED TO DEVELOP A PASSAGE CHANNEL. THIS PROJECT WAS DEVELOPED IN COMPLIANCE WITH THE ARBO II PROJECT DESIGN CRITERIA FOR LEGACY STRUCTURE REMOVAL (ACTIVITY CATEGORY 3) AND GRAVEL AUGMENTATION (ACTIVITY CATEGORY 2).

SPATIAL REFERENCE

SURVEY CONTROL USED FOR THE PROJECT IS PROVIDED ON DRAWING 1.5 AND COORDINATES CORRESPOND TO THE TOP CENTER OF CONTROL MARKERS.

LIDAR, GPS RTK, AND TOTAL STATION:
HORIZONTAL PROJECTION: OREGON STATE PLANE NORTH SOUTH
HORIZ DATUM: NAD83 UNITS: INT FT
VERT DATUM: NAVD88 UNITS: INT FT

SURVEY DATE: 10/19/2022
LIDAR COLLECTED: 2009

STANDARD OF PRACTICE

RDG WORKS EXCLUSIVELY IN THE RIVER ENVIRONMENT AND EMPLOYS THE MOST CURRENT AND ACCEPTED PRACTICES AVAILABLE FOR PLANNING AND DESIGN OF FISH PASSAGE, RESTORATION, AND CHANNEL ENHANCEMENT PROJECTS. THE ANALYSIS FOR THE FISH PASSAGE DESIGN RELIED ON CURRENT FISH PASSAGE CRITERIA FROM ODFW AND NMFS/NOAA. ALL WORK WAS PERFORMED OR DIRECTED BY A REGISTERED PROFESSIONAL CIVIL ENGINEER WITH PAST EXPERIENCE IN FISH PASSAGE DESIGN.

REUSE OF DRAWINGS

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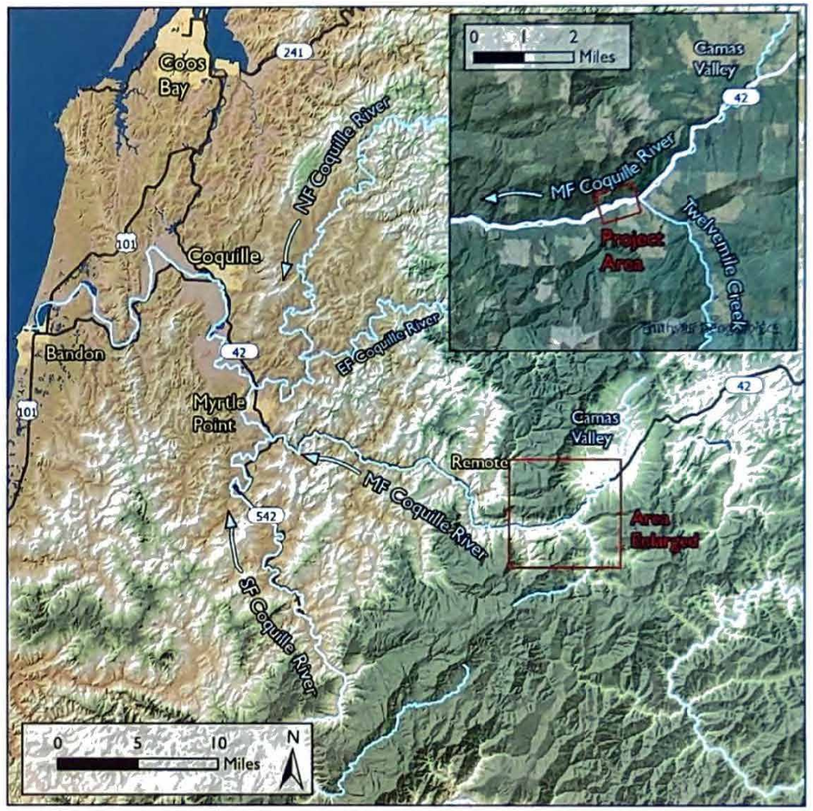
PROJECT VICINITY MAP



SW 1/4 OF THE SW 1/4 OF SECTION 10, T.30S., R.09W., WILLAMETTE MERIDIAN
DOUGLAS COUNTY, OREGON
USGS QUADRANGLE: BONE MOUNTAIN, OR

REGISTERED PROFESSIONAL ENGINEER
86205PE
OREGON
MAY 10, 2016
MELANIE CAROLINE KLYM
EXPIRES: 6/30/25

DIRECTION OF SECTION
SECTION OR DETAIL
SHEET WHERE SECTION OR DETAIL IS SHOWN

CROSS-SECTION SHEET REFERENCE

RDG RIVER DESIGN GROUP
236 Wisconsin Avenue
Whitefish, MT 59937
406.862.4927
311 SW Jefferson Avenue
Corvallis, OR 97333
541.738.2920

COVER SHEET AND NOTES
MIDDLE FORK COQUILLE RIVER FISH PASSAGE
DOUGLAS COUNTY, OR

NO.	DATE	BY	DESCRIPTION	CHK
0	6/15/23	MCK	FINAL DESIGN	SW

PROJECT NUMBER
RDG-22-274

DRAWING NUMBER
1.0

ARBO II GENERAL CONSERVATION MEASURES

1.3.2 GENERAL AQUATIC CONSERVATION MEASURES

FROM NATIONAL MARINE FISHERIES SERVICE (NMFS) ENDANGERED SPECIES ACT SECTION 7 FORMAL PROGRAMMATIC CONFERENCE AND BIOLOGICAL OPINION AND MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT CONSULTATION FOR AQUATIC RESTORATION ACTIVITIES IN THE STATES OF OREGON AND WASHINGTON (ARBO II) (NMFS REFERENCE NUMBER NWP-2013-9664).

NOTE: MEASURES 1 - 11 ARE PROGRAM ADMINISTRATION MEASURES AND NOT RELEVANT TO CONSTRUCTION.

12. **IN-WATER WORK PERIOD -** FOLLOW THE APPROPRIATE STATE (ODFW 2008; WDFW 2010) OR MOST RECENT GUIDELINES FOR TIMING OF IN-WATER WORK. IF WORK OCCURS IN OCCUPIED OREGON CHUB HABITAT, IN-WATER WORK WILL NOT OCCUR BETWEEN JUNE 1 AND AUGUST 15. IN THOSE FEW INSTANCES WHEN PROJECTS WILL BE IMPLEMENTED IN CALIFORNIA, IDAHO, OR NEVADA, FOLLOW APPROPRIATE STATE GUIDELINES. THE ACTION AGENCIES WILL REQUEST EXCEPTIONS TO IN-WATER WORK WINDOWS THROUGH LEVEL 1 NMFS OR USFWS REPRESENTATIVES AS WELL AS ESSENTIAL STATE AGENCIES (AT NMFS, BRANCH CHIEFS WILL HAVE THE AUTHORITY TO APPROVE VARIANCES). FOR NATIONAL FORESTS IN THE STATE OF WASHINGTON, THE FOREST SERVICE WILL WORK WITH WASHINGTON DEPARTMENT OF FISH AND WILDLIFE (WDFW) TO DETERMINE IN-WATER WORK PERIODS, USING THE PROCESS CONTAINED IN THE 2012 MEMORANDUM OF UNDERSTANDING BETWEEN THE WDFW AND USDA-FOREST SERVICE, PACIFIC NORTHWEST REGION REGARDING HYDRAULIC PROJECTS CONDUCTED BY THE FOREST SERVICE (WDFW AND USDA-FOREST SERVICE 2012).

13. **FISH PASSAGE -** FISH PASSAGE WILL BE PROVIDED FOR ANY ADULT OR JUVENILE FISH LIKELY TO BE PRESENT IN THE ACTION AREA DURING CONSTRUCTION, UNLESS PASSAGE DID NOT EXIST BEFORE CONSTRUCTION, STREAM ISOLATION AND DEWATERING IS REQUIRED DURING PROJECT IMPLEMENTATION, OR WHERE THE STREAM REACH IS NATURALLY IMPASSIBLE AT THE TIME OF CONSTRUCTION. AFTER CONSTRUCTION, ADULT AND JUVENILE PASSAGE THAT MEETS NMFS'S FISH PASSAGE CRITERIA (NMFS 2011E) WILL BE PROVIDED FOR THE LIFE OF THE STRUCTURE.

14. **SITE ASSESSMENT FOR CONTAMINANTS -** IN DEVELOPED OR PREVIOUSLY DEVELOPED SITES, SUCH AS AREAS WITH PAST DREDGE MINES, OR SITES WITH KNOWN OR SUSPECTED CONTAMINATION, A SITE ASSESSMENT FOR CONTAMINANTS WILL BE CONDUCTED ON PROJECTS THAT INVOLVE EXCAVATION OF >20 CUBIC YARDS OF MATERIAL. THE ACTION AGENCIES WILL COMPLETE A SITE ASSESSMENT TO IDENTIFY THE TYPE, QUANTITY, AND EXTENT OF ANY POTENTIAL CONTAMINATION. THE LEVEL OF DETAIL AND RESOURCES COMMITTED TO SUCH AN ASSESSMENT WILL BE COMMENSURATE WITH THE LEVEL AND TYPE OF PAST OR CURRENT DEVELOPMENT AT THE SITE. THE ASSESSMENT MAY INCLUDE THE FOLLOWING:
    a. REVIEW OF READILY AVAILABLE RECORDS, SUCH AS FORMER SITE USE, BUILDING PLANS, RECORDS OF ANY PRIOR CONTAMINATION EVENTS.
    b. SITE VISIT TO OBSERVE THE AREAS USED FOR VARIOUS INDUSTRIAL PROCESSES AND THE CONDITION OF THE PROPERTY.
    c. INTERVIEWS WITH KNOWLEDGEABLE PEOPLE, SUCH AS SITE OWNERS, OPERATORS, OCCUPANTS, NEIGHBORS, LOCAL GOVERNMENT OFFICIALS, *ETC.*
    d. REPORT THAT INCLUDES AN ASSESSMENT OF THE LIKELIHOOD THAT CONTAMINANTS ARE PRESENT AT THE SITE.

15. **POLLUTION AND EROSION CONTROL MEASURES -** IMPLEMENT THE FOLLOWING POLLUTION AND EROSION CONTROL MEASURES:
    a. PROJECT CONTACT: IDENTIFY A PROJECT CONTACT (NAME, PHONE NUMBER, AN ADDRESS) THAT WILL BE RESPONSIBLE FOR IMPLEMENTING POLLUTION AND EROSION CONTROL MEASURES.
    b. LIST AND DESCRIBE ANY HAZARDOUS MATERIAL THAT WOULD BE USED AT THE PROJECT SITE, INCLUDING PROCEDURES FOR INVENTORY, STORAGE, HANDLING, AND MONITORING; NOTIFICATION PROCEDURES; SPECIFIC CLEAN-UP AND DISPOSAL INSTRUCTIONS FOR DIFFERENT PRODUCTS AVAILABLE ON THE SITE; PROPOSED METHODS FOR DISPOSAL OF SPILLED MATERIAL; AND EMPLOYEE TRAINING FOR SPILL CONTAINMENT.
    c. TEMPORARILY STORE ANY WASTE LIQUIDS GENERATED AT THE STAGING AREAS UNDER COVER ON AN IMPERVIOUS SURFACE, SUCH AS TARPAULINS, UNTIL SUCH TIME THEY CAN BE PROPERLY TRANSPORTED TO AND TREATED AT AN APPROVED FACILITY FOR TREATMENT OF HAZARDOUS MATERIALS.
    d. PROCEDURES BASED ON BEST MANAGEMENT PRACTICES TO CONFINE, REMOVE, AND DISPOSE OF CONSTRUCTION WASTE, INCLUDING EVERY TYPE OF DEBRIS, DISCHARGE WATER, CONCRETE, CEMENT, GROUT, WASHOUT FACILITY, WELDING SLAG, PETROLEUM PRODUCT, OR OTHER HAZARDOUS MATERIALS GENERATED, USED, OR STORED ON-SITE.
    e. PROCEDURES TO CONTAIN AND CONTROL A SPILL OF ANY HAZARDOUS MATERIAL GENERATED, USED OR STORED ON-SITE, INCLUDING NOTIFICATION OF PROPER AUTHORITIES. ENSURE THAT MATERIALS FOR EMERGENCY EROSION AND HAZARDOUS MATERIALS CONTROL ARE ONSITE
    (*e.g.*, SILT FENCE, STRAW BALES, OIL-ABSORBING FLOATING BOOM WHENEVER SURFACE WATER IS PRESENT).
    f. BEST MANAGEMENT PRACTICES TO CONFINE VEGETATION AND SOIL DISTURBANCE TO THE MINIMUM AREA, AND MINIMUM LENGTH OF TIME, AS NECESSARY TO COMPLETE THE ACTION, AND OTHERWISE PREVENT OR MINIMIZE EROSION ASSOCIATED WITH THE ACTION AREA.
    g. NO UNCURED CONCRETE OR FORM MATERIALS WILL BE ALLOWED TO ENTER THE ACTIVE STREAM CHANNEL.
    h. STEPS TO CEASE WORK UNDER HIGH FLOWS, EXCEPT FOR EFFORTS TO AVOID OR MINIMIZE RESOURCE DAMAGE.

16. **SITE PREPARATION**
    a. **FLAGGING SENSITIVE AREAS -** PRIOR TO CONSTRUCTION, CLEARLY MARK CRITICAL RIPARIAN VEGETATION AREAS, WETLANDS, AND OTHER SENSITIVE SITES TO MINIMIZE GROUND DISTURBANCE.
    b. **STAGING AREA -** ESTABLISH STAGING AREAS FOR STORAGE OF VEHICLES, EQUIPMENT, AND FUELS TO MINIMIZE EROSION INTO OR CONTAMINATION OF STREAMS AND FLOODPLAINS.
        i. NO TOPOGRAPHICAL RESTRICTIONS - PLACE STAGING AREA 150 FEET OR MORE FROM ANY NATURAL WATER BODY OR WETLAND IN AREAS WHERE TOPOGRAPHY DOES NOT RESTRICT SUCH A DISTANCE.
        ii. TOPOGRAPHICAL RESTRICTIONS -PLACE STAGING AREA AWAY FROM ANY NATURAL WATER BODY OR WETLAND TO THE GREATEST EXTENT POSSIBLE IN AREAS WITH HIGH TOPOGRAPHICAL RESTRICTION, SUCH AS CONSTRICTED VALLEY TYPES.
    c. **TEMPORARY EROSION CONTROLS -** PLACE SEDIMENT BARRIERS PRIOR TO CONSTRUCTION AROUND SITES WHERE SIGNIFICANT LEVELS OF EROSION MAY ENTER THE STREAM DIRECTLY OR THROUGH ROAD DITCHES. TEMPORARY EROSION CONTROLS WILL BE IN PLACE BEFORE ANY SIGNIFICANT ALTERATION OF THE ACTION SITE AND WILL BE REMOVED ONCE THE SITE HAS BEEN STABILIZED FOLLOWING CONSTRUCTION ACTIVITIES.
    d. **STOCKPILE MATERIALS -** MINIMIZE CLEARING AND GRUBBING ACTIVITIES WHEN PREPARING STAGING, PROJECT, AND OR STOCKPILE AREAS. ANY LW, TOPSOIL, AND NATIVE CHANNEL MATERIAL DISPLACED BY CONSTRUCTION WILL BE STOCKPILED FOR USE DURING SITE RESTORATION. MATERIALS USED FOR IMPLEMENTATION OF AQUATIC RESTORATION CATEGORIES (*E.G.*, LW, BOULDERS, FENCING MATERIAL) MAY BE STAGED WITHIN THE 100-YEAR FLOODPLAIN.
    e. **HAZARD TREES -** WHERE APPROPRIATE, INCLUDE HAZARD TREE REMOVAL (AMOUNT AND TYPE) IN PROJECT DESIGN. FELL HAZARD TREES WHEN THEY POSE A SAFETY RISK. IF POSSIBLE, FELL HAZARD TREES WITHIN RIPARIAN AREAS TOWARDS A STREAM. KEEP FELLED TREES ON SITE WHEN NEEDED TO MEET COARSE LW OBJECTIVES.

17. **HEAVY EQUIPMENT USE**
    a. **CHOICE OF EQUIPMENT -** HEAVY EQUIPMENT WILL BE COMMENSURATE WITH THE PROJECT AND OPERATED IN A MANNER THAT MINIMIZES ADVERSE EFFECTS TO THE ENVIRONMENT (*E.G.*, MINIMALLY-SIZED, LOW PRESSURE TIRES, MINIMAL HARD TURN PATHS FOR TRACKED VEHICLES, TEMPORARY MATS OR PLATES WITHIN WET AREAS OR SENSITIVE SOILS).
    b. **FUELING AND CLEANING AND INSPECTION FOR PETROLEUM PRODUCTS AND INVASIVE WEEDS**
        i. ALL EQUIPMENT USED FOR INSTREAM WORK WILL BE CLEANED FOR PETROLEUM ACCUMULATIONS, DIRT, PLANT MATERIAL (TO PREVENT THE SPREAD OF NOXIOUS WEEDS), AND LEAKS REPAIRED PRIOR TO ENTERING THE PROJECT AREA. SUCH EQUIPMENT INCLUDES LARGE MACHINERY, STATIONARY POWER EQUIPMENT (*E.G.*, GENERATORS, CANES), AND GAS-POWERED EQUIPMENT WITH TANKS LARGER THAN FIVE GALLONS.
        ii. STORE AND FUEL EQUIPMENT IN STAGING AREAS AFTER DAILY USE.
        iii. INSPECT DAILY FOR FLUID LEAKS BEFORE LEAVING THE VEHICLE STAGING AREA FOR OPERATION.
        iv. THOROUGHLY CLEAN EQUIPMENT BEFORE OPERATION BELOW ORDINARY HIGH WATER OR WITHIN 50 FEET OF ANY NATURAL WATER BODY OR AREAS THAT DRAIN DIRECTLY TO STREAMS OR WETLANDS AND AS OFTEN AS NECESSARY DURING OPERATION TO REMAIN GREASE FREE.
    c. **TEMPORARY ACCESS ROADS -** EXISTING ROADWAYS WILL BE USED WHENEVER POSSIBLE. MINIMIZE THE NUMBER OF TEMPORARY ACCESS ROADS AND TRAVEL PATHS TO LESSEN SOIL DISTURBANCE AND COMPACTION AND IMPACTS TO VEGETATION. TEMPORARY ACCESS ROADS WILL NOT BE BUILT ON SLOPES WHERE GRADE, SOIL, OR OTHER FEATURES SUGGEST A LIKELIHOOD OF EXCESSIVE EROSION OR FAILURE. WHEN NECESSARY, TEMPORARY ACCESS ROADS WILL BE OBLITERATED OR REVEGETATED. TEMPORARY ROADS IN WET OR FLOODED AREAS WILL BE RESTORED BY THE END OF THE APPLICABLE IN-WATER WORK PERIOD. CONSTRUCTION OF NEW PERMANENT ROADS IS NOT PERMITTED.
    d. **STREAM CROSSINGS -** MINIMIZE NUMBER AND LENGTH OF STREAM CROSSINGS. SUCH CROSSINGS WILL BE AT RIGHT ANGLES AND AVOID POTENTIAL SPAWNING AREAS TO THE GREATEST EXTENT POSSIBLE. STREAM CROSSINGS SHALL NOT INCREASE THE RISK OF CHANNEL RE-ROUTING AT LOW AND HIGH WATER CONDITIONS. AFTER PROJECT COMPLETION, TEMPORARY STREAM CROSSINGS WILL BE ABANDONED AND THE STREAM CHANNEL AND BANKS RESTORED.
    e. **WORK FROM TOP OF BANK -** TO THE EXTENT FEASIBLE, HEAVY EQUIPMENT WILL WORK FROM THE TOP OF THE BANK, UNLESS WORK INSTREAM WOULD RESULT IN LESS DAMAGE TO THE AQUATIC ECOSYSTEM.
    f. **TIMELY COMPLETION -** MINIMIZE TIME IN WHICH HEAVY EQUIPMENT IS IN STREAM CHANNELS, RIPARIAN AREAS, AND WETLANDS. COMPLETE EARTHWORK (INCLUDING DRILLING, EXCAVATION, DREDGING, FILLING AND COMPACTING) AS QUICKLY AS POSSIBLE. DURING EXCAVATION, STOCKPILE NATIVE STREAMBED MATERIALS ABOVE THE BANKFULL ELEVATION, WHERE IT CANNOT REENTER THE STREAM, FOR LATER USE.

18. **SITE RESTORATION**
    a. **INITIATE REHABILITATION -** UPON PROJECT COMPLETION, REHABILITATE ALL DISTURBED AREAS IN A MANNER THAT RESULTS IN SIMILAR OR BETTER THAN PRE-WORK CONDITIONS THROUGH REMOVAL OF PROJECT RELATED WASTE, SPREADING OF STOCKPILED MATERIALS (SOIL, LW, TREES, *ETC.*) SEEDING, OR PLANTING WITH LOCAL NATIVE SEED MIXES OR PLANTS.
    b. **SHORT-TERM STABILIZATION -** MEASURES MAY INCLUDE THE USE OF NON-NATIVE STERILE SEED MIX (WHEN NATIVE SEEDS ARE NOT AVAILABLE), WEED-FREE CERTIFIED STRAW, JUTE MATTING, AND OTHER SIMILAR TECHNIQUES. SHORT-TERM STABILIZATION MEASURES WILL BE MAINTAINED UNTIL PERMANENT EROSION CONTROL MEASURES ARE EFFECTIVE. STABILIZATION MEASURES WILL BE INSTIGATED WITHIN THREE DAYS OF CONSTRUCTION COMPLETION.
    c. **REVEGETATION -** REPLANT EACH AREA REQUIRING REVEGETATION PRIOR TO OR AT THE BEGINNING OF THE FIRST GROWING SEASON FOLLOWING CONSTRUCTION. ACHIEVE RE- ESTABLISHMENT OF VEGETATION IN DISTURBED AREAS TO AT LEAST 70% OF PRE-PROJECT LEVELS WITHIN THREE YEARS. USE AN APPROPRIATE MIX OF SPECIES THAT WILL ACHIEVE ESTABLISHMENT AND EROSION CONTROL OBJECTIVES, PREFERABLY FORB, GRASS, SHRUB, OR TREE SPECIES NATIVE TO THE PROJECT AREA OR REGION AND APPROPRIATE TO THE SITE. BARRIERS WILL BE INSTALLED AS NECESSARY TO PREVENT ACCESS TO REVEGETATED SITES BY LIVESTOCK OR UNAUTHORIZED PERSONS.
    d. **PLANTING MANUALS -** ALL RIPARIAN PLANTINGS SHALL FOLLOW FOREST SERVICE DIRECTION DESCRIBED IN THE REGIONAL LETTER TO UNITS, USE OF NATIVE AND NONNATIVE PLANTS ON NATIONAL FORESTS AND GRASSLANDS MAY 2006 (FINAL DRAFT), AND OR BLM INSTRUCTION MEMORANDUM NO. OR-2001-014, POLICY ON THE USE OF NATIVE SPECIES PLANT MATERIAL.
    e. **DECOMPACT SOILS -** DECOMPACT SOIL BY SCARIFYING THE SOIL SURFACE OF ROADS AND PATHS, STREAM CROSSINGS, STAGING, AND STOCKPILE AREAS SO THAT SEEDS AND PLANTINGS CAN ROOT.

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ARBO II GENERAL CONSERVATION MEASURES

MIDDLE FORK COQUILLE RIVER FISH PASSAGE

DOUGLAS COUNTY, OR

NO.	DATE	BY	DESCRIPTION	CHK
0	6/15/23	MCK	FINAL DESIGN	SW

PROJECT NUMBER
RDG-22-274

DRAWING NUMBER
1.1

ARBO II GENERAL CONSERVATION MEASURES

1.3.2 GENERAL AQUATIC CONSERVATION MEASURES, CONTINUED

FROM NATIONAL MARINE FISHERIES SERVICE (NMFS) ENDANGERED SPECIES ACT SECTION 7 FORMAL PROGRAMMATIC CONFERENCE AND BIOLOGICAL OPINION AND MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT CONSULTATION FOR AQUATIC RESTORATION ACTIVITIES IN THE STATES OF OREGON AND WASHINGTON (ARBO II) (NMFS REFERENCE NUMBER NWP-2013-9664).

19. **MONITORING -** MONITORING WILL BE CONDUCTED BY ACTION AGENCY STAFF, AS APPROPRIATE FOR THAT PROJECT, DURING AND AFTER A PROJECT TO TRACK EFFECTS AND COMPLIANCE WITH THIS OPINION.
    a. **IMPLEMENTATION**
        i. VISUALLY MONITOR DURING PROJECT IMPLEMENTATION TO ENSURE EFFECTS ARE NOT GREATER (AMOUNT, EXTENT) THAN ANTICIPATED AND TO CONTACT LEVEL 1 REPRESENTATIVES IF PROBLEMS ARISE.
        ii. FIX ANY PROBLEMS THAT ARISE DURING PROJECT IMPLEMENTATION.
        iii. REGULAR BIOLOGIST/HYDROLOGIST COORDINATION IF BIOLOGIST/HYDROLOGIST IS NOT ALWAYS ON SITE TO ENSURE CONTRACTOR IS FOLLOWING ALL STIPULATIONS.
    b. **401 CERTIFICATION -** TO MINIMIZE SHORT-TERM DEGRADATION TO WATER QUALITY DURING PROJECT IMPLEMENTATION, FOLLOW CURRENT 401 CERTIFICATION PROVISIONS OF THE FEDERAL CLEAN WATER ACT FOR MAINTENANCE OR WATER QUALITY STANDARDS DESCRIBED BY THE FOLLOWING: OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY (OREGON BLM, FOREST SERVICE, AND BIA); WASHINGTON DEPARTMENT OF ECOLOGY (WASHINGTON BLM); AND THE MEMORANDUM OF UNDERSTANDING BETWEEN THE WASHINGTON DEPARTMENT OF FISH AND WILDLIFE AND FOREST SERVICE REGARDING HYDRAULIC PROJECTS CONDUCTED BY FOREST SERVICE, PACIFIC NORTHWEST REGION (WDFW AND USDA-FOREST SERVICE 2012); CALIFORNIA, IDAHO, OR NEVADA 401 CERTIFICATION PROTOCOLS (BLM AND FOREST SERVICE).
    c. **POST PROJECT -** A POST-PROJECT REVIEW SHALL BE CONDUCTED AFTER WINTER AND SPRING HIGH FLOWS.
        i. FOR EACH PROJECT, CONDUCT A WALK THROUGH/VISUAL OBSERVATION TO DETERMINE IF THERE ARE POST-PROJECT AFFECTS THAT WERE NOT CONSIDERED DURING CONSULTATION. FOR FISH PASSAGE AND REVEGETATION PROJECTS, MONITOR IN THE FOLLOWING MANNER:
        ii. FISH PASSAGE PROJECTS - NOTE ANY PROBLEMS WITH CHANNEL SCOUR OR BEDLOAD DEPOSITION, SUBSTRATE, DISCONTINUOUS FLOW, VEGETATION ESTABLISHMENT, OR INVASIVE PLANT INFESTATION.
        iii. REVEGETATION - FOR ALL PLANT TREATMENT PROJECTS, INCLUDING SITE RESTORATION, MONITOR FOR AND REMOVE INVASIVE PLANTS UNTIL NATIVE PLANTS BECOME ESTABLISHED.
        iv. IN CASES WHERE REMEDIAL ACTION IS REQUIRED, SUCH ACTIONS ARE PERMITTED WITHOUT ADDITIONAL CONSULTATION IF THEY USE RELEVANT PDC AND AQUATIC CONSERVATION MEASURES AND THE EFFECTS OF THE ACTION CATEGORIES ARE NOT EXCEEDED.

20. **WORK AREA ISOLATION, SURFACE WATER WITHDRAWALS, AND FISH CAPTURE AND RELEASE -** ISOLATE THE CONSTRUCTION AREA AND REMOVE FISH FROM A PROJECT SITE FOR PROJECTS THAT INCLUDE CONCENTRATED AND MAJOR EXCAVATION AT A SINGLE LOCATION WITHIN THE STREAM CHANNEL. THIS CONDITION WILL TYPICALLY APPLY TO THE FOLLOWING AQUATIC RESTORATION CATEGORIES: FISH PASSAGE RESTORATION; DAM, TIDEGATE, AND LEGACY STRUCTURE REMOVAL; CHANNEL RECONSTRUCTION/RELOCATION.
    a. **ISOLATE CAPTURE AREA -** INSTALL BLOCK NETS AT UP AND DOWNSTREAM LOCATIONS OUTSIDE OF THE CONSTRUCTION ZONE TO EXCLUDE FISH FROM ENTERING THE PROJECT AREA. LEAVE NETS SECURED TO THE STREAM CHANNEL BED AND BANKS UNTIL CONSTRUCTION ACTIVITIES WITHIN THE STREAM CHANNEL ARE COMPLETE. IF BLOCK NETS OR TRAPS REMAIN IN PLACE MORE THAN ONE DAY, MONITOR THE NETS AND OR TRAPS AT LEAST ON A DAILY BASIS TO ENSURE THEY ARE SECURED TO THE BANKS AND FREE OF ORGANIC ACCUMULATION AND TO MINIMIZE FISH PREDATION IN THE TRAP.
    b. **CAPTURE AND RELEASE -** FISH TRAPPED WITHIN THE ISOLATED WORK AREA WILL BE CAPTURED AND RELEASED AS PRUDENT TO MINIMIZE THE RISK OF INJURY, THEN RELEASED AT A SAFE RELEASE SITE, PREFERABLY UPSTREAM OF THE ISOLATED REACH IN A POOL OR OTHER AREA THAT PROVIDES COVER AND FLOW REFUGE. COLLECT FISH IN THE BEST MANNER TO MINIMIZE POTENTIAL STRANDING AND STRESS BY SEINE OR DIP NETS AS THE AREA IS SLOWLY DEWATERED, BAITED MINNOW TRAPS PLACED OVERNIGHT, OR ELECTROFISHING (IF OTHER OPTIONS ARE INEFFECTIVE). FISH MUST BE HANDLED WITH EXTREME CARE AND KEPT IN WATER THE MAXIMUM EXTENT POSSIBLE DURING TRANSFER PROCEDURES. A HEALTHY ENVIRONMENT FOR THE STRESSED FISH SHALL BE PROVIDED--LARGE BUCKETS (FIVE-GALLON MINIMUM TO PREVENT OVERCROWDING) AND MINIMAL HANDLING OF FISH. PLACE LARGE FISH IN BUCKETS SEPARATE FROM SMALLER PREY-SIZED FISH. MONITOR WATER TEMPERATURE IN BUCKETS AND WELL-BEING OF CAPTURED FISH. IF BUCKETS ARE NOT BEING IMMEDIATELY TRANSPORTED, USE AERATORS TO MAINTAIN WATER QUALITY. AS RAPIDLY AS POSSIBLE, BUT AFTER FISH HAVE RECOVERED, RELEASE FISH. IN CASES WHERE THE STREAM IS INTERMITTENT UPSTREAM, RELEASE FISH IN DOWNSTREAM AREAS AND AWAY FROM THE INFLUENCE OF THE CONSTRUCTION. CAPTURE AND RELEASE WILL BE SUPERVISED BY A FISHERY BIOLOGIST EXPERIENCED WITH WORK AREA ISOLATION AND SAFE HANDLING OF ALL FISH.
    c. **ELECTROFISHING -** USE ELECTROFISHING ONLY WHERE OTHER MEANS OF FISH CAPTURE MAY NOT BE FEASIBLE OR EFFECTIVE. IF ELECTROFISHING WILL BE USED TO CAPTURE FISH FOR SALVAGE, NMFS'S ELECTROFISHING GUIDELINES WILL BE FOLLOWED (NMFS 2000). (ANADROMOUS SALMONID PASSAGE FACILITY DESIGN GUIDELINES ARE AVAILABLE FROM THE NMFS NORTHWEST REGION, PROTECTED RESOURCES DIVISION IN PORTLAND, OREGON. (HTTP://WWW.NWR.NOAA.GOV/ESA-SALMON-REGULATIONS-PERMITS/4D-RULES/UPLOAD/ELECTRO2000.PDF)).
        i. REASONABLE EFFORT SHOULD BE MADE TO AVOID HANDLING FISH IN WARM WATER TEMPERATURES, SUCH AS CONDUCTING FISH EVACUATION FIRST THING IN THE MORNING, WHEN THE WATER TEMPERATURE WOULD LIKELY BE COOLEST. NO ELECTROFISHING SHOULD OCCUR WHEN WATER TEMPERATURES ARE ABOVE 18ºC OR ARE EXPECTED TO RISE ABOVE THIS TEMPERATURE PRIOR TO CONCLUDING THE FISH CAPTURE.
        ii. IF FISH ARE OBSERVED SPAWNING DURING THE IN-WATER WORK PERIOD, ELECTROFISHING SHALL NOT BE CONDUCTED IN THE VICINITY OF SPAWNING FISH OR ACTIVE REDDS.
        iii. ONLY DIRECT CURRENT (DC) OR PULSED DIRECT CURRENT SHALL BE USED.
        iv. CONDUCTIVITY <100, USE VOLTAGE RANGES FROM 900 TO 1100. CONDUCTIVITY FROM 100 TO 300, USE VOLTAGE RANGES FROM 500 TO 800. CONDUCTIVITY GREATER THAN 300, USE VOLTAGE TO 400.
        v. BEGIN ELECTROFISHING WITH MINIMUM PULSE WIDTH AND RECOMMENDED VOLTAGE AND THEN GRADUALLY INCREASE TO THE POINT WHERE FISH ARE IMMOBILIZED AND CAPTURED. TURN OFF CURRENT ONCE FISH ARE IMMOBILIZED.
        vi. DO NOT ALLOW FISH TO COME INTO CONTACT WITH ANODE. DO NOT ELECTROFISH AN AREA FOR AN EXTENDED PERIOD OF TIME. REMOVE FISH IMMEDIATELY FROM WATER AND HANDLE AS DESCRIBED ABOVE (PDC 20B). DARK BANDS ON THE FISH INDICATE INJURY, SUGGESTING A REDUCTION IN VOLTAGE AND PULSE WIDTH AND LONGER RECOVERY TIME.
        vii. IF MORTALITY IS OCCURRING DURING SALVAGE, IMMEDIATELY DISCONTINUE SALVAGE OPERATIONS (UNLESS THIS WOULD RESULT IN ADDITIONAL FISH MORTALITY), REEVALUATE THE CURRENT PROCEDURES, AND ADJUST OR POSTPONE PROCEDURES TO REDUCE MORTALITY.
    d. **DEWATER CONSTRUCTION SITE -**WHEN DEWATERING IS NECESSARY TO PROTECT SPECIES OR CRITICAL HABITAT, DIVERT FLOW AROUND THE CONSTRUCTION SITE WITH A COFFER DAM (BUILT WITH NON-EROSIVE MATERIALS), TAKING CARE TO NOT DEWATER DOWNSTREAM CHANNELS DURING DEWATERING. PASS FLOW AND FISH DOWNSTREAM WITH A BY-PASS CULVERT OR A WATER-PROOF LINED DIVERSION DITCH. DIVERSION SANDBAGS CAN BE FILLED WITH MATERIAL MINED FROM THE FLOODPLAIN AS LONG AS SUCH MATERIAL IS REPLACED AT END OF PROJECT. SMALL AMOUNTS OF INSTREAM MATERIAL CAN BE MOVED TO HELP SEAL AND SECURE DIVERSION STRUCTURES. IF ESA LISTED-FISH MAY BE PRESENT AND PUMPS ARE REQUIRED TO DEWATER, THE INTAKE MUST HAVE A FISH SCREEN(S) AND BE OPERATED IN ACCORDANCE WITH NMFS FISH SCREEN CRITERIA DESCRIBED BELOW (IN PART E.IV) OF THIS SECTION. DISSIPATE FLOW ENERGY AT THE BYPASS OUTFLOW TO PREVENT DAMAGE TO RIPARIAN VEGETATION OR STREAM CHANNEL. IF DIVERSION ALLOWS FOR DOWNSTREAM FISH PASSAGE, PLACE DIVERSION OUTLET IN A LOCATION TO PROMOTE SAFE REENTRY OF FISH INTO THE STREAM CHANNEL, PREFERABLY INTO POOL HABITAT WITH COVER. PUMP SEEPAGE WATER FROM THE DE-WATERED WORK AREA TO A TEMPORARY STORAGE AND TREATMENT SITE OR INTO UPLAND AREAS AND ALLOW WATER TO FILTER THROUGH VEGETATION PRIOR TO REENTERING THE STREAM CHANNEL. (TO THE EXTENT POSSIBLE, INCORPORATE MEASURES TO PROTECT LAMPREY. FOR INSTRUCTIONS ON HOW TO DEWATER AREAS OCCUPIED BY LAMPREY, SEE BEST MANAGEMENT PRACTICES TO MINIMIZE ADVERSE EFFECTS TO PACIFIC LAMPREY, ENTOSPHENUS TRIDENTATUS (2010)).
    e. **SURFACE WATER WITHDRAWALS**
        i. SURFACE WATER MAY BE DIVERTED TO MEET CONSTRUCTION NEEDS, BUT ONLY IF DEVELOPED SOURCES ARE UNAVAILABLE OR INADEQUATE. WHERE ESA-LISTED FISH MAY BE PRESENT, DIVERSIONS MAY NOT EXCEED 10% OF THE AVAILABLE FLOW AND FISH SCREEN(S) WILL BE INSTALLED, OPERATED, AND MAINTAINED ACCORDING TO NMFS'S FISH SCREEN CRITERIA (NMFS 2011E).
        ii. FOR THE DEWATERING OF A WORK SITE TO REMOVE OR INSTALL CULVERTS, BRIDGE ABUTMENTS *ETC.*, IF ESA-LISTED FISH MAY BE PRESENT, A FISH SCREEN THAT MEETS CRITERIA SPECIFIED BY NMFS (2011E) MUST BE USED ON THE INTAKE TO AVOID JUVENILE FISH ENTRAINMENT. IF ESA-LISTED SALMON, STEELHEAD, EULACHON, OR GREEN STURGEON MAY BE PRESENT, THE ACTION AGENCIES WILL ENSURE THAT THE FISH SCREEN DESIGN IS REVIEWED AND APPROVED BY NMFS FOR CONSISTENCY WITH NMFS (2011E) CRITERIA IF THE DIVERSION (GRAVITY OR PUMP) IS AT A RATE GREATER THAN 3 CFS. NMFS APPROVED FISH SCREENS HAVE THE FOLLOWING SPECIFICATIONS: A) AN AUTOMATED CLEANING DEVICE WITH A MINIMUM EFFECTIVE SURFACE AREA OF 2.5 SQUARE FEET PER CFS, AND A NOMINAL MAXIMUM APPROACH VELOCITY OF 0.4 FEET PER SECOND (FPS), OR NO AUTOMATED CLEANING DEVICE, A MINIMUM EFFECTIVE SURFACE AREA OF 1 SQUARE FOOT PER CFS, AND A NOMINAL MAXIMUM APPROACH RATE OF 0.2 FPS; AND B) A ROUND OR SQUARE SCREEN MESH THAT IS NO LARGER THAN 2.38 MM (0.094 INCHES) IN THE NARROW DIMENSION, OR ANY OTHER SHAPE THAT IS NO LARGER THAN 1.75 MM (0.069 INCHES) IN THE NARROW DIMENSION.
    f. **STREAM RE-WATERING -** UPON PROJECT COMPLETION, SLOWLY RE-WATER THE CONSTRUCTION SITE TO PREVENT LOSS OF SURFACE WATER DOWNSTREAM AS THE CONSTRUCTION SITE STREAMBED ABSORBS WATER AND TO PREVENT A SUDDEN RELEASE OF SUSPENDED SEDIMENT. MONITOR DOWNSTREAM DURING RE-WATERING TO PREVENT STRANDING OF AQUATIC ORGANISMS BELOW THE CONSTRUCTION SITE.

REGIONAL GENERAL PERMIT 4 SECTION 401 WATER QUALITY CERTIFICATION GENERAL CONDITIONS

FROM OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ) 2007-999-5 UPDATED 01/21/2022; REGIONAL GENERAL PERMIT 4 (RGP-4), AQUATIC HABITAT RESTORATION ACTIVITIES IN OREGON SECTION 401 WATER QUALITY CERTIFICATION.

NOTE: CONDITIONS NOT LISTED HERE ARE COVERED BY ARBO II GENERAL CONSERVATION MEASURES AND/OR NOTED ELSEWHERE IN THESE DRAWINGS.

20. **POLLUTION PREVENTION AND RESPONSE MEASURES**
    c. MAINTENANCE
    i. ALL EQUIPMENT OPERATED WITHIN STATE WATERS MUST USE BIO-DEGRADABLE HYDRAULIC FLUID.
    ii. A MAINTENANCE LOG DOCUMENTING EQUIPMENT MAINTENANCE INSPECTIONS AND ACTIONS MUST BE KEPT ON-SITE AND AVAILABLE UPON REQUEST.
    d. SPILL INCIDENT AND REPORTING - IN THE EVENT THAT HARMFUL MATERIALS ARE DISCHARGED INTO STATE WATERS, OR ONTO LAND WITH A POTENTIAL TO ENTER STATE WATERS, THE DISCHARGE MUST PROMPTLY BE REPORTED TO THE OREGON EMERGENCY RESPONSE SYSTEM (800-452-0311) AND CONTAINMENT AND CLEANUP SHOULD BE COMPLETED AS SOON AS POSSIBLE.
    e. FISH IMPACTS OR MORTALITY - IF PROJECT-RELATED ACTIVITIES RESULT IN DISTRESSED OR DYING FISH, IN-WATER ACTIVITIES MUST CEASE. TAKE APPROPRIATE CORRECTIVE MEASURES, DOCUMENT ENVIRONMENTAL CONDITIONS, COLLECT SAMPLES OF FISH AND/OR WATER AS APPROPRIATE AND NOTIFY DEQ, ODFW, AND OTHER APPROPRIATE REGULATORY AGENCIES.

21. **PREVIOUSLY CONTAMINATED SOIL AND GROUNDWATER -** IF CONTAMINATED SOIL OR GROUNDWATER IS ENCOUNTERED, IT MUST BE HANDLED AND DISPOSED OF IN ACCORDANCE WITH THE SOIL AND GROUNDWATER MANAGEMENT PLAN FOR THE SITE, AS WELL AS LOCAL, STATE, AND FEDERAL REGULATIONS. THE ENVIRONMENTAL CLEANUP SECTION OF DEQ MUST BE NOTIFIED AT 800-452-4011 EX. 6258.

RDG
236 Wisconsin Avenue
Whitefish, MT 59937
406.862.4927
311 SW Jefferson Avenue
Corvallis, OR 97333
541.738.2920

ARBO II GENERAL CONSERVATION MEASURES
MIDDLE FORK COQUILLE RIVER FISH PASSAGE
DOUGLAS COUNTY, OR

NO.	DATE	BY	DESCRIPTION	CHK
0	6/15/23	MCK	FINAL DESIGN	SW

PROJECT NUMBER
RDG-22-274

DRAWING NUMBER
1.2

CONS. MEAS. FOR LAMPREY AND MUSSELS

CONSERVATION RECOMMENDATIONS FOR PACIFIC LAMPREY AND FRESHWATER MUSSELS

CONSERVATION RECOMMENDATIONS ARE DISCRETIONARY AGENCY ACTIVITIES DESIGNED TO MINIMIZE OR AVOID ADVERSE EFFECTS OF A PROPOSED ACTION ON LISTED SPECIES OR DESIGNATED CRITICAL HABITAT, TO ASSIST IN THE IMPLEMENTATION OF RECOVERY PLANS OR TO OBTAIN INFORMATION.

PACIFIC LAMPREY

THE SERVICE RECOMMENDS THAT THE ACTION AGENCIES REQUIRE CONSIDERATIONS FOR THE BIOLOGICAL NEEDS OF LAMPREY SPECIES FOR ALL PERMITS REQUIRING INSTREAM OR NEAR-STREAM PROJECTS, OR PROJECTS THAT AFFECT PASSAGE. THE FOLLOWING RECOMMENDATIONS ARE FOR PACIFIC LAMPREY, BUT MAY ALSO BENEFIT OTHER SPECIES OF LAMPREY (E.G. RIVER LAMPREY, WESTERN BROOK LAMPREY). THOUGH LAMPREY ARE NOT CURRENTLY LISTED UNDER THE ENDANGERED SPECIES ACT, CONSIDERATION OF PACIFIC LAMPREY IS IMPORTANT FOR MANY REASONS:

- THEY ARE A TRIBAL TRUST SPECIES, BECAUSE THEY HAVE A HIGH CULTURAL SIGNIFICANCE TO NATIVE AMERICAN TRIBES FROM CALIFORNIA TO ALASKA AND;
- THEY MAY HAVE SERVED AS A PRIMARY FOOD SOURCE FOR AQUATIC, MAMMAL, AND AVIAN PREDATORS THAT ALSO PREY ON SALMONIDS AND OTHER RECREATIONAL AND COMMERCIALLY IMPORTANT FISH SPECIES.
- THEIR ABUNDANCE AND DISTRIBUTION HAS SIGNIFICANTLY DECLINED THROUGHOUT ITS RANGE OVER THE PAST THREE DECADES, AND EFFORTS TO REVERSE THIS DECLINE ARE NEEDED (USFWS 2019).

WHILE PACIFIC LAMPREY ARE ANADROMOUS LIKE SALMON, THEIR LIFE HISTORY HAS SOME UNIQUE ASPECTS THAT ARE TYPICALLY NOT CONSIDERED DURING IMPLEMENTATION OF INSTREAM ACTIVITIES, EVEN WHEN USING DESIGN CONSIDERATIONS AND BEST MANAGEMENT PRACTICES FOR SALMONIDS. ADJUSTMENTS TO MINIMIZE ADVERSE EFFECTS TO PACIFIC LAMPREY SHOULD BE MADE AT THE PROJECT DESIGN PHASE TO ACCOMMODATE LAMPREY PASSAGE, LAMPREY SPAWNING PERIODS, EXISTENCE OF NESTS, UPSTREAM AND DOWNSTREAM MOVEMENT, AND AVOID DIRECT MORTALITY TO LARVAL LAMPREY BURROWED IN THE SUBSTRATE.

FOR CONTEXT, AN ABBREVIATED DESCRIPTION OF PACIFIC LAMPREY LIFE HISTORY AND HABITAT USE IN FRESHWATER IS PROVIDED AS FOLLOWS:

AS ADULTS, PACIFIC LAMPREY RETURN FROM THE OCEAN TO FRESH WATER PRIMARILY DURING SPRING AND SUMMER MONTHS, PRIMARILY MOVING AT NIGHT. THEY OFTEN SPEND ABOUT 1 YEAR IN FRESHWATER HABITAT BEFORE SPAWNING, USUALLY HOLDING UNDER LARGE SUBSTRATE (E.G., LARGE BOULDERS, BEDROCK CREVICES) ASSOCIATED WITH LOW WATER VELOCITIES UNTIL THE FOLLOWING SPRING, WHEN THEY MOVE TO SPAWNING AREAS. ADULT LAMPREYS SPAWN GENERALLY BETWEEN MARCH AND JULY IN GRAVEL BOTTOM STREAM, USUALLY AT THE UPSTREAM END OF RIFFLE HABITAT NEAR SUITABLE HABITAT FOR LARVAL LAMPREY (SOMETIMES CALLED AMMOCOETES), AND DIE AFTER SPAWNING (BEAMISH 1980).

AFTER HATCHING, THE LARVAL LAMPREY DRIFT DOWNSTREAM TO AREAS OF LOW STREAM VELOCITY AND BURROW INTO DEPOSITIONAL AREAS WITH SAND OR SILT SUBSTRATE, AND FILTER FEED ON ALGAE, DIATOMS, AND DETRITUS FOR 3 TO 7 YEARS. LARVAE CAN BE DIFFICULT TO DETECT SINCE THEY RANGE IN SIZE FROM ABOUT 0.08 TO 6 INCHES LONG; THE SMALLER ONES ARE EASY TO OVERLOOK. LARVAE WILL MOVE DOWNSTREAM DURING FLOW EVENTS, MOSTLY AT NIGHT. MANY AGE CLASSES OF LARVAE WILL CONGREGATE TOGETHER, OFTEN OCCURRING IN LARGE CLUSTERS IN DEPOSITIONAL SITES WITH FINE SEDIMENTS WHERE HABITATS ARE OPTIMAL, MAKING LAMPREY LARVAE POPULATIONS PARTICULARLY SUSCEPTIBLE TO ACTIVITIES THAT INVOLVE DREDGING/EXCAVATING, STRANDING AND USE OF TOXIC CHEMICALS. METAMORPHOSIS OF LARVAL LAMPREY INTO THE JUVENILE OUTMIGRANT FORM OR “MACROPHTHALMIA” OCCURS GENERALLY FROM JULY THROUGH NOVEMBER BUT IS VARIABLE DEPENDING ON DISTANCE FROM SALT WATER. OUT-MIGRATION TO THE OCEAN OCCURS DURING OR SHORTLY AFTER TRANSFORMATION (BEAMISH 1980). OUT-MIGRATION GENERALLY PEAKS WITH RISING STREAM AND RIVER FLOWS IN LATE WINTER OR EARLY SPRING (KOSTOW 2002).

THREATS TO PACIFIC LAMPREYS RESIDING IN UPPER PORTIONS OF STREAM/RIVER HABITATS

LARVAL LAMPREY SPEND MOST OF THEIR TIME BURROWED IN STREAM SUBSTRATES, MOVING DURING FLOW EVENTS AND MOSTLY AT NIGHT. MANY AGE CLASSES CAN CONCENTRATE TOGETHER IN THE SAME AREAS BECAUSE OF HABITAT PREFERENCE, MAKING LARVAL LAMPREY POPULATIONS PARTICULARLY SUSCEPTIBLE TO ACTIVITIES THAT INVOLVE DREDGING/EXCAVATING, STRANDING AND USE OF TOXIC CHEMICALS. ADULTS ALSO PREFER TO MOVE AT NIGHT, HIDING IN LARGE ROCK AND BOULDER SUBSTRATE DURING THE DAY. THREATS TO LAMPREYS INCLUDE

1) POOR PASSAGE CONDITIONS AND ENTRAINMENT (PRIMARILY FROM CULVERTS, WATER DIVERSIONS, HYDROELECTRIC DAMS AND OTHER PASSAGE BARRIERS),
2) DE-WATERING AND STREAMFLOW MANAGEMENT FROM WATER DIVERSIONS, INSTREAM PROJECTS AND HYDROPOWER PEAKING, DREDGING FROM CONSTRUCTION, CHANNEL MAINTENANCE AND MINING ACTIVITIES,
3) CHEMICAL POISONING FROM ACCIDENTAL SPILLS OR CHEMICAL TREATMENTS,
4) POOR WATER QUALITY, AND
5) STREAM AND FLOODPLAIN DEGRADATION (CHANNELIZATION, LOSS OF SIDE CHANNELS, SCOURING).

LAMPREY RECOMMENDATIONS

THE BIOLOGICAL CONSIDERATIONS OF LAMPREY SHOULD BE INCORPORATED INTO PROJECT DESIGN, OBJECTIVES, SALVAGE AND BEST MANAGEMENT PRACTICES FOR THE PROTECTION AND CONSERVATION OF THIS SPECIES. KEY TO THE RECOMMENDATIONS ARE THE FOLLOWING:

1. CONSULT WITH LOCAL FEDERAL, STATE AND TRIBAL BIOLOGISTS TO OBTAIN INFORMATION ON KNOWN PACIFIC LAMPREY POPULATIONS IN THE DRAINAGE AND AT THE PROJECT AREA.
2. IF LAMPREY ARE KNOWN TO BE PRESENT AT A SITE OR CONSIDERED TO BE PRESENT BASED ON HABITAT, PERFORM A SITE RECONNAISSANCE TO IDENTIFY LOCATIONS OF LAMPREY SPAWNING AND REARING HABITAT, AND IF POSSIBLE, LAMPREY PRESENCE WITH NEST SURVEYS. USE THIS INFORMATION TO FACILITATE PLANNING THE PROJECT AND INFLUENCE WORK WINDOWS TO AVOID IMPACTS TO LAMPREY.
3. IF LAMPREY ARE PRESENT IN THE PROJECT AREA, THEN EFFORTS SHOULD BE CONDUCTED TO SALVAGE LAMPREY AND MOVE THEM TO SUITABLE HABITAT PRIOR TO INITIATION OF THE PROJECT (PROVIDED THE PROPOSED PROJECT WOULD RESULT IN DISTURBING SEDIMENT WHERE THE LAMPREY ARE PRESENT).

CURRENTLY THERE ARE SEVERAL GUIDANCE DOCUMENTS AVAILABLE TO ASSIST IN SURVEYING FOR LAMPREY AND MINIMIZING DISTURBANCE, WHICH INCLUDE:

1. *BEST MANAGEMENT PRACTICES TO MINIMIZE ADVERSE EFFECTS TO PACIFIC LAMPREY* HTTP://WWW.FWS.GOV/COLUMBIARIVER/PUBLICATIONS/BMP_LAMPREY_2010.PDF (U.S FISH AND WILDLIFE SERVICE AND U.S. FOREST SERVICE 2010, ENTIRE), WHICH COVERS A BROAD SPECTRUM OF ACTIONS INCLUDING BIOLOGY, SALVAGE DURING DEWATERING ACTIONS, HABITAT RESTORATION, SCREENING, AND PASSAGE.
2. *PRACTICAL GUIDELINES FOR INCORPORATING ADULT PACIFIC LAMPREY PASSAGE AT FISHWAYS* (PACIFIC LAMPREY TECHNICAL WORKGROUP 2017, ENTIRE) (HTTPS://WWW.FWS.GOV/PACIFICLAMPREY/MAINPAGE.CFM), WHICH INCLUDES SPECIFIC GUIDANCE ON PROVIDING UPSTREAM PASSAGE WITHIN EXISTING FISHWAYS AND IN NEW FISHWAY DESIGNS.
3. *DESIGN GUIDELINES FOR PACIFIC LAMPREY PASSAGE STRUCTURES* (ZOBOTT ET AL. 2015, ENTIRE), WHICH PROVIDES SPECIFIC GUIDANCE FOR DESIGNING AND INSTALLING LAMPREY RAMPS FOR UPSTREAM PASSAGE: HTTP://WWW.UIDAHO.EDU/~/MEDIA/UIDAHO-RESPONSIVE/FILES/CNR/FERL/TECHNICAL-REPORTS/2015/2015-5-LPS-DESIGN.ASHX
4. *EFFECTIVENESS OF COMMON FISH SCREEN MATERIALS TO PROTECT LAMPREY AMMOCOETES* (ROSE AND MESA 2012) COMPARES COMMON FISH SCREEN MATERIALS, FINDING THAT WOVEN WIRE PERFORMED THE WORST FOR LAMPREY AND SHOULD BE REPLACED WITH OTHER TYPES OF SCREENS (PERFORATED PLATE, VERTICAL BAR OR INTERLOCKING BAR SCREENS): HTTP://DX.DOI.ORG/10.1080/02755947.2012.678965
5. *PACIFIC LAMPREY HABITAT RESTORATION GUIDE* (CRANDALL AND WITTENBACH 2015): (HTTP://WWW.METHOWSALMON.ORG/DOCUMENTS/PACIFICLAMPREYRESTORATIONGUIDE_WEB.PDF), WHICH PROVIDES A DETAILED DESCRIPTION OF THE BIOLOGY, ECOLOGY, AND CULTURAL SIGNIFICANCE OF LAMPREY, AS WELL AS THREATS TO THEIR POPULATION AND BEST MANAGEMENT PRACTICES TO PROTECT AND RESTORE POPULATIONS.
6. ADDITIONAL DOCUMENTS, INFORMATION, AND MATERIALS MAY BE FOUND ON THE WEBSITE FOR THE PACIFIC LAMPREY CONSERVATION INITIATIVE, HOSTED BY THE SERVICE: HTTPS://WWW.FWS.GOV/PACIFICLAMPREY/MAINPAGE.CFM

LAMPREY REPORTING

IN ORDER FOR THE SERVICE TO BE KEPT INFORMED OF ACTIONS THAT MINIMIZE OR AVOID ADVERSE EFFECTS OR THAT BENEFIT PACIFIC LAMPREY, OTHER LAMPREY SPECIES, AND THEIR HABITATS, THE SERVICE REQUESTS NOTIFICATION OF THE IMPLEMENTATION OF ANY OF THE ABOVE CONSERVATION RECOMMENDATIONS, AND COPIES OF ANY RELEVANT PUBLICATIONS FOR CONSERVING LAMPREY SPECIES AND THEIR HABITATS. PLEASE SEND DOCUMENTS TO:

STATE SUPERVISOR
U.S. FISH AND WILDLIFE SERVICE - OREGON FISH AND WILDLIFE OFFICE
ATTN: ANN GRAY
2600 SE 98TH AVENUE, SUITE 100
PORTLAND, OREGON 97266

FRESHWATER MUSSELS

WHILE NO SPECIES OF FRESHWATER MUSSELS ARE FEDERALLY LISTED IN THE PACIFIC NORTHWEST, THEY ARE OF HIGH VALUE (CULTURALLY, ECOLOGICALLY, AND ENVIRONMENTALLY) TO MANY ENTITIES. THE SERVICE RECOMMENDS THAT THE ACTION AGENCIES REQUIRE CONSIDERATIONS FOR THE BIOLOGICAL NEEDS OF ALL NATIVE FRESHWATER MUSSEL SPECIES FOR ALL PERMITS REQUIRING INSTREAM OR NEAR-STREAM PROJECTS. THERE ARE SIX SPECIES OF WESTERN FRESHWATER MUSSELS: THE WESTERN PEARLSHELL, THE WESTERN RIDGED MUSSEL, THE WINGED FLOATER, THE OREGON FLOATER, THE YUKON FLOATER, AND WOEBEGONE FLOATER. THE XERCES SOCIETY FOR INVERTEBRATE CONSERVATION (XERCES SOCIETY) MAINTAINS A GREAT RESOURCE FOR WESTERN FRESHWATER MUSSELS AT HTTPS://XERCES.ORG/WESTERN-FRESHWATER-MUSSELS/. TO PARAPHRASE FROM THE XERCES SOCIETY'S WEBSITE:

> “FRESHWATER MUSSELS ARE EXPERIENCING A DRAMATIC DECLINE; 72% PERCENT OF NORTH AMERICAN FRESHWATER MUSSELS ARE CONSIDERED EXTINCT OR IMPERILED, REPRESENTING ONE OF THE MOST AT-RISK GROUPS OF ANIMALS IN THE UNITED STATES. THE DECLINE OF FRESHWATER MUSSELS HAS BEEN WELL STUDIED IN EASTERN NORTH AMERICA BUT HAS RECEIVED VERY LITTLE ATTENTION IN STATES WEST OF THE ROCKY MOUNTAINS….
>
> “NATIVE FRESHWATER MUSSELS HAVE IMMENSE ECOLOGICAL AND CULTURAL SIGNIFICANCE. AS FILTER-FEEDERS, THEY CAN SUBSTANTIALLY IMPROVE WATER QUALITY BY FILTERING OUT HARMFUL POLLUTANTS, WHICH BENEFITS BOTH HUMANS AND AQUATIC ECOSYSTEMS…. THESE ANIMALS CAN BE HIGHLY SENSITIVE TO ENVIRONMENTAL CHANGES AND THUS HAVE GREAT POTENTIAL TO BE USED AS INDICATORS OF WATER QUALITY. FRESHWATER MUSSELS HAVE BEEN HISTORICALLY IMPORTANT SOURCES OF FOOD, TOOLS, AND OTHER IMPLEMENTS FOR MANY NATIVE AMERICAN TRIBES. NATIVE AMERICANS IN THE INTERIOR COLUMBIA BASIN HAVE HARVESTED THESE ANIMALS FOR AT LEAST 10,000 YEARS, AND THEY REMAIN AN IMPORTANT CULTURAL HERITAGE FOR TRIBES TODAY.”

MUSSEL RECOMMENDATIONS

THE BIOLOGICAL CONSIDERATIONS OF FRESHWATER MUSSEL SPECIES SHOULD BE INCORPORATED INTO PROJECT DESIGN, OBJECTIVES, SALVAGE AND RELOCATION, AND BEST MANAGEMENT PRACTICES FOR THE PROTECTION AND CONSERVATION OF THIS SPECIES. THE XERCES SOCIETY HAS DEVELOPED A PUBLICATION “CONSERVATION THE GEMS OF OUR WATERS: BEST MANAGEMENT PRACTICES FOR PROTECTING NATIVE WESTERN FRESHWATER MUSSELS DURING AQUATIC AND RIPARIAN RESTORATION, CONSTRUCTION, AND LAND MANAGEMENT PROJECTS AND ACTIVITIES (BLEVINS ET AL. 2017), AND A COMPANION HANDBOOK, MUSSEL FRIENDLY RESTORATION (BLEVINS ET AL. 2019)- BOTH AVAILABLE ONLINE AT HTTPS://XERCES.ORG/ENDANGERED-SPECIES/FRESHWATER-MUSSELS. THESE DOCUMENTS INCLUDE INFORMATION ON DETERMINING IF MUSSELS ARE PRESENT AT YOUR SITE, PROJECT DEVELOPMENT AND REVIEW, SALVAGE AND RELOCATION, MONITORING AND PRACTICES FOR MINIMIZING PROJECT IMPACTS FOR SEVERAL DIFFERENT ACTIVITIES (I.E. CONSTRUCTION, VEGETATION MANAGEMENT, FLOW MANAGEMENT, RESTORATION). THE XERCES SOCIETY WEBSITE ALSO HAS A FIELD IDENTIFICATION GUIDE DEVELOPED BY THE XERCES SOCIETY AND CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION AT HTTPS://PNWMUSSELS.ORG/WP-CONTENT/UPLOADS/2016/07/QUICKMUSSELGUIDE_CTUIR.PDF.

THE BIOLOGICAL CONSIDERATIONS OF MUSSELS SHOULD BE INCORPORATED INTO PROJECT DESIGN, OBJECTIVES, SALVAGE AND BEST MANAGEMENT PRACTICES FOR THE PROTECTION AND CONSERVATION OF THESE SPECIES. KEY TO THE RECOMMENDATIONS ARE THE FOLLOWING:

1. CONSULT WITH LOCAL FEDERAL, STATE AND TRIBAL BIOLOGISTS TO OBTAIN INFORMATION ON KNOWN MUSSEL BEDS IN THE DRAINAGE AND AT THE PROJECT AREA.
2. IF FRESHWATER MUSSELS ARE KNOWN TO BE PRESENT AT A SITE OR CONSIDERED TO BE PRESENT BASED ON HABITAT, A SITE RECONNAISSANCE SURVEY CAN BE PERFORMED TO IDENTIFY LOCATIONS OF MUSSELS. THIS INFORMATION CAN BE USED TO FACILITATE PLANNING THE PROJECT TO AVOID IMPACTS TO MUSSELS.
3. IF FRESHWATER MUSSELS ARE PRESENT IN THE PROJECT AREA, THEN EFFORTS CAN BE CONDUCTED TO SALVAGE MUSSELS AND MOVE THEM TO SUITABLE HABITAT PRIOR TO INITIATION OF THE PROJECT (PROVIDED THE PROPOSED PROJECT WOULD RESULT IN DISTURBING SEDIMENT WHERE THE MUSSELS ARE PRESENT). NOTE THAT SUCCESSFUL SALVAGING OF MUSSELS MUST BE CONDUCTED BY A TRAINED PROFESSIONAL FAMILIAR WITH THE PROCESS, AND ANY EFFORTS TO SALVAGE MUSSELS MUST BE COORDINATED WITH THE XERCES SOCIETY.

FRESHWATER MUSSELS REPORTING

IN ORDER FOR THE SERVICE TO BE KEPT INFORMED OF ACTIONS THAT MINIMIZE OR AVOID ADVERSE EFFECTS OR THAT BENEFIT FRESHWATER MUSSELS, AND THEIR HABITATS, THE SERVICE REQUESTS NOTIFICATION OF THE IMPLEMENTATION OF ANY OF THE ABOVE CONSERVATION RECOMMENDATIONS, AND COPIES OF ANY RELEVANT PUBLICATIONS FOR CONSERVING MUSSEL SPECIES AND THEIR HABITATS. PLEASE SEND DOCUMENTS TO:

STATE SUPERVISOR
U.S. FISH AND WILDLIFE SERVICE - OREGON FISH AND WILDLIFE OFFICE
ATTN: COURTNEY NEWLON
2600 SE 98TH AVENUE, SUITE 100
PORTLAND, OREGON 97266

RDG
236 Wisconsin Avenue
Whitefish, MT 59937
406.862.4927
311 SW Jefferson Avenue
Corvallis, OR 97333
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CONS. MEAS. FOR LAMPREY AND MUSSELS
MIDDLE FORK COQUILLE RIVER FISH PASSAGE
DOUGLAS COUNTY, OR

NO.	DATE	BY	DESCRIPTION	CHK
0	6/15/23	MCK	FINAL DESIGN	SW

PROJECT NUMBER
RDG-22-274

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1.3

Drawing 4 of 21

CONS. MEAS. FOR LAMPREY AND MUSSELS

CONSERVATION RECOMMENDATIONS FOR PACIFIC LAMPREY AND FRESHWATER MUSSELS, CONTINUED

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CONS. MEAS. FOR LAMPREY AND MUSSELS

MIDDLE FORK COQUILLE RIVER FISH PASSAGE

DOUGLAS COUNTY, OR

NO.	DATE	BY	DESCRIPTION	CHK
0	6/15/23	MCK	FINAL DESIGN	SW

PROJECT NUMBER
RDG-22-274

DRAWING NUMBER
1.4

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CONTROL NETWORK

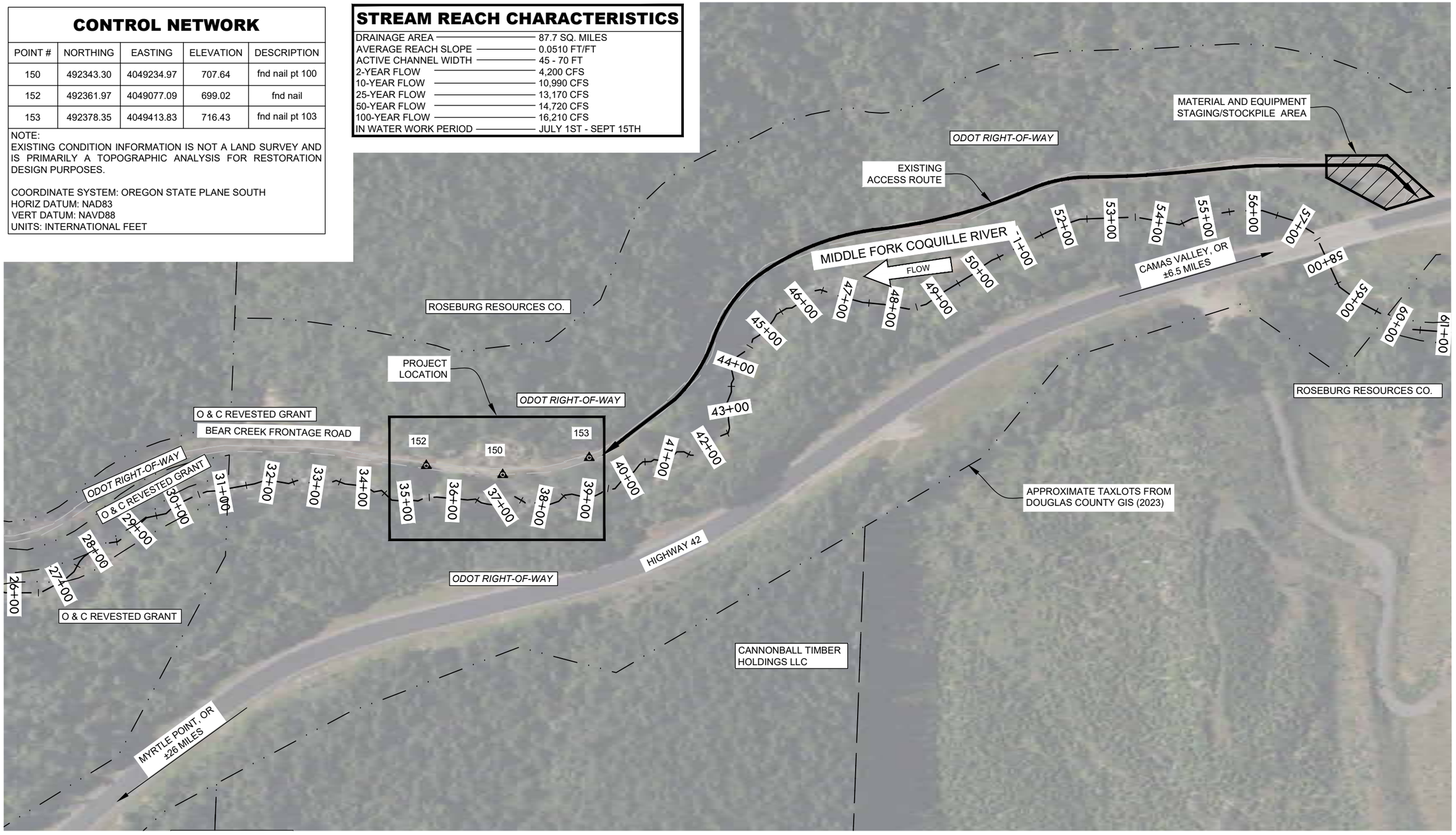
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
150	492343.30	4049234.97	707.64	fnd nail pt 100
152	492361.97	4049077.09	699.02	fnd nail
153	492378.35	4049413.83	716.43	fnd nail pt 103

NOTE:
EXISTING CONDITION INFORMATION IS NOT A LAND SURVEY AND IS PRIMARILY A TOPOGRAPHIC ANALYSIS FOR RESTORATION DESIGN PURPOSES.

COORDINATE SYSTEM: OREGON STATE PLANE SOUTH
HORIZ DATUM: NAD83
VERT DATUM: NAVD88
UNITS: INTERNATIONAL FEET

STREAM REACH CHARACTERISTICS

DRAINAGE AREA	87.7 SQ. MILES
AVERAGE REACH SLOPE	0.0510 FT/FT
ACTIVE CHANNEL WIDTH	45 - 70 FT
2-YEAR FLOW	4,200 CFS
10-YEAR FLOW	10,990 CFS
25-YEAR FLOW	13,170 CFS
50-YEAR FLOW	14,720 CFS
100-YEAR FLOW	16,210 CFS
IN WATER WORK PERIOD	JULY 1ST - SEPT 15TH



1 SITE OVERVIEW, ACCESS, AND STAGING

1" = 200'

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236 Wisconsin Avenue
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SITE OVERVIEW AND SURVEY CONTROL

MIDDLE FORK COQUILLE RIVER FISH PASSAGE
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1.5

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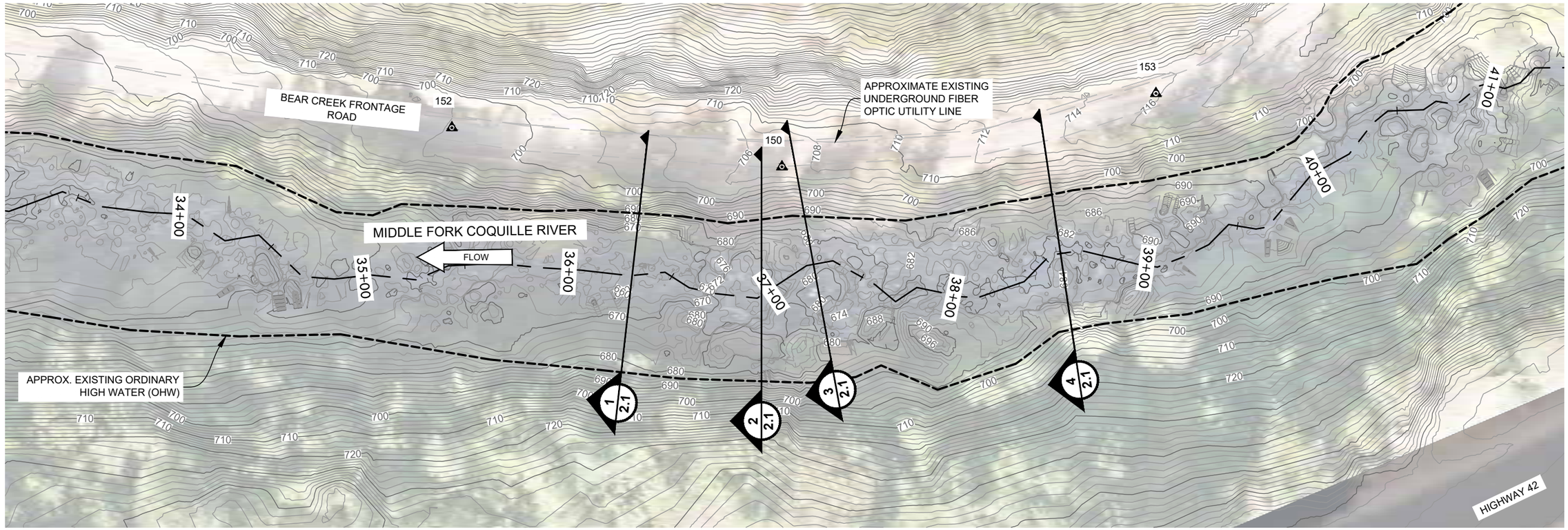
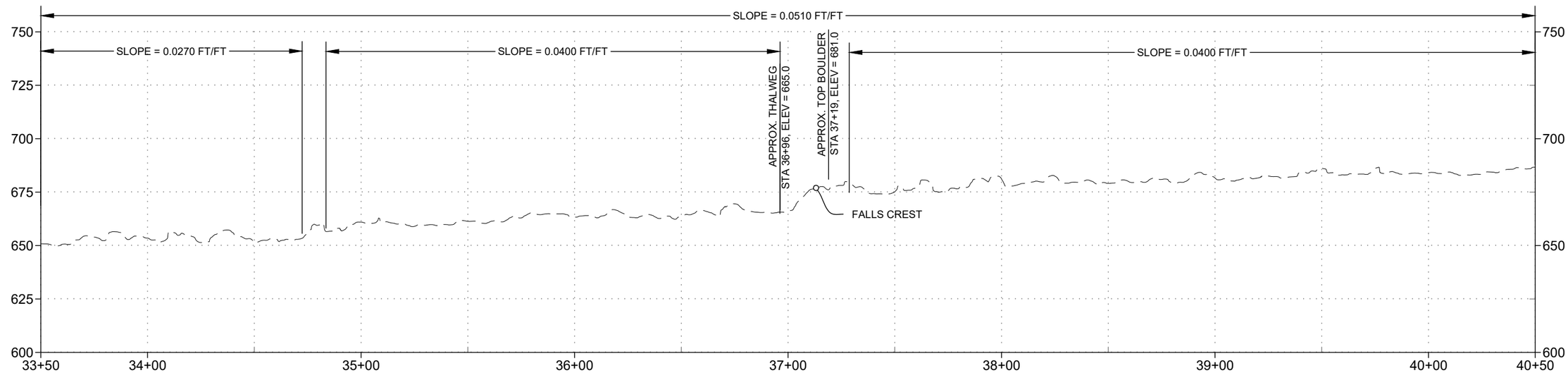


1 EXISTING CONDITIONS PLAN VIEW

1" = 50'



2 EXISTING RIVER PROFILE

HORIZ 1" = 50'
VERT 1" = 50'

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EXISTING CONDITIONS

MIDDLE FORK COQUILLE RIVER FISH PASSAGE
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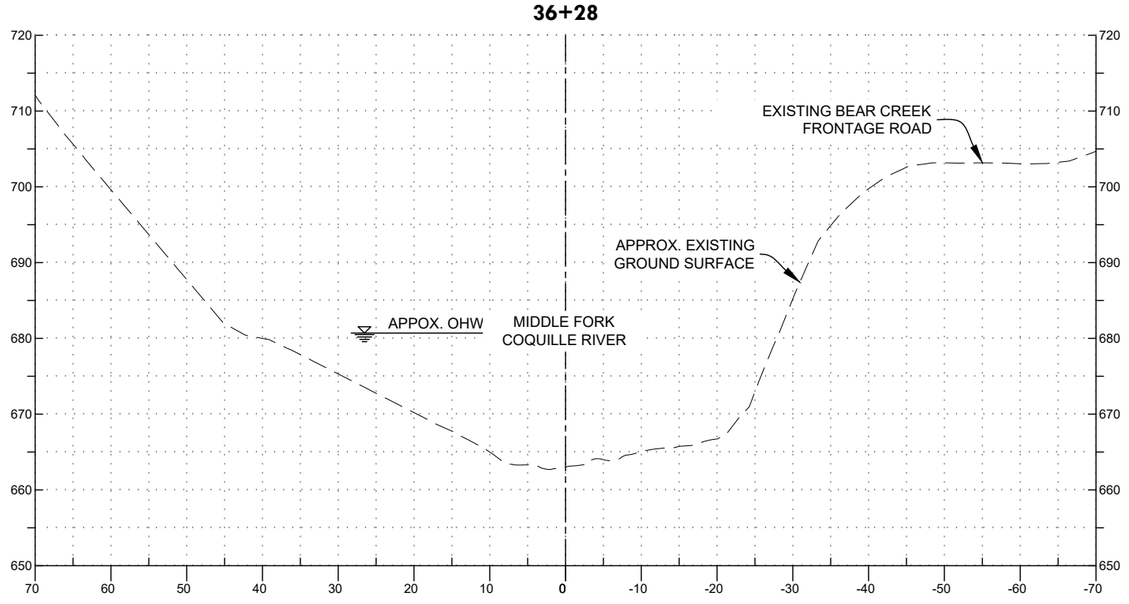
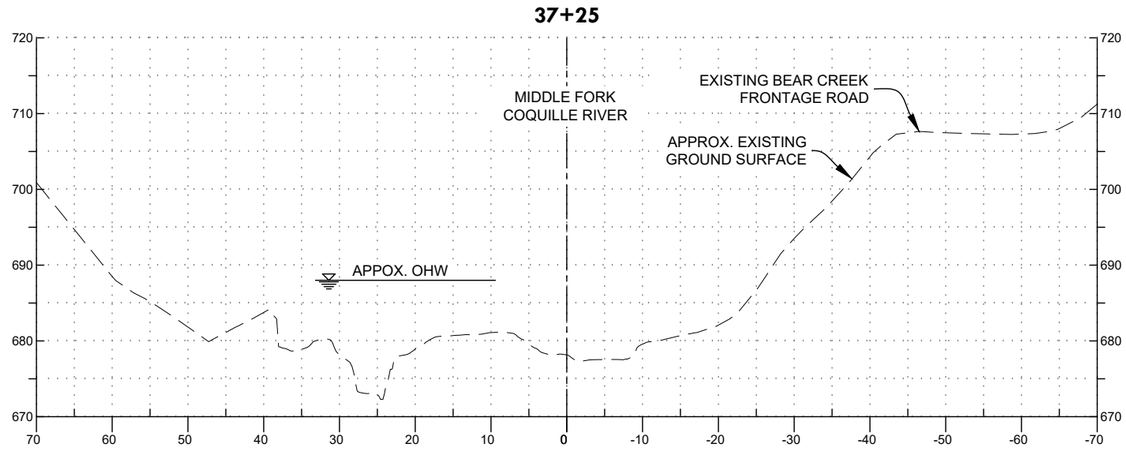
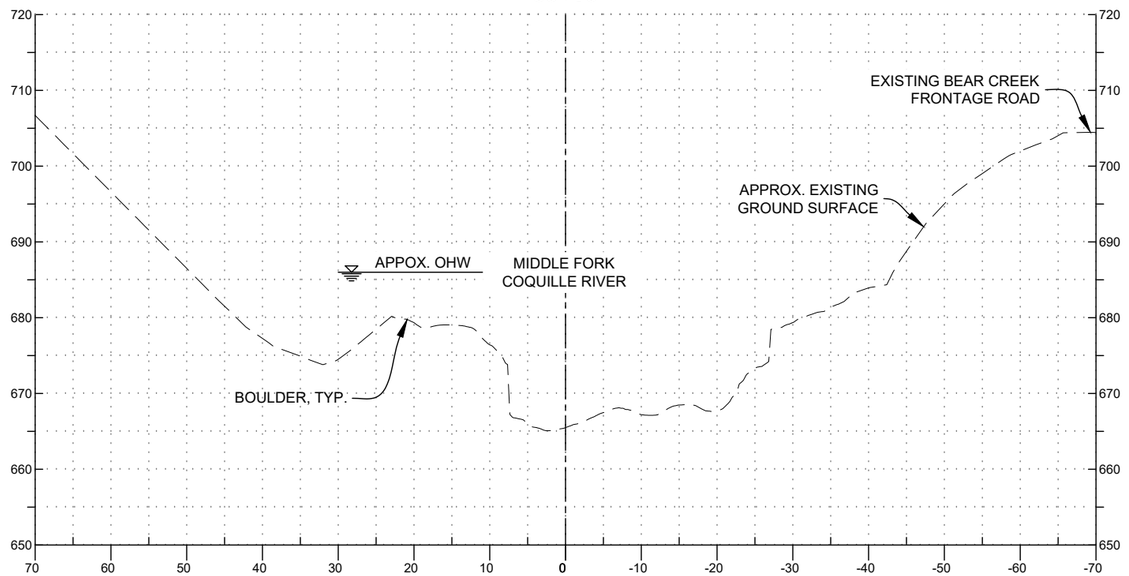


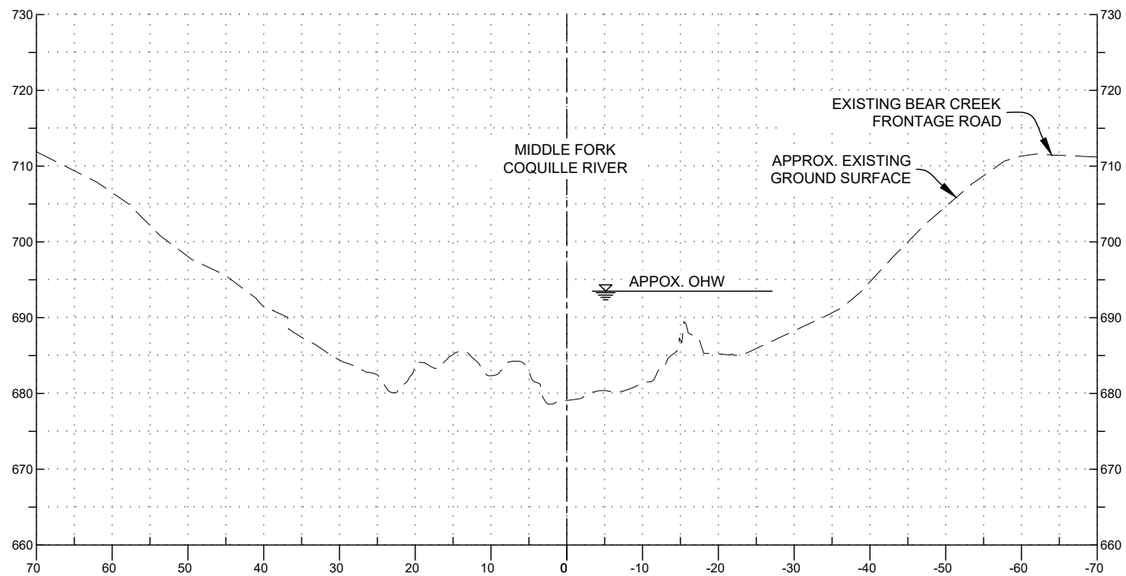
1 SECTION DOWNSTREAM OF FALLS
SECTION LOOKING DOWNSTREAM
HORIZ 1" = 20'
VERT 1" = 20'



3 SECTION AT CREST OF FALLS
SECTION LOOKING DOWNSTREAM
HORIZ 1" = 20'
VERT 1" = 20'



2 SECTION AT TOE OF FALLS
SECTION LOOKING DOWNSTREAM
HORIZ 1" = 20'
VERT 1" = 20'



4 SECTION UPSTREAM OF FALLS
SECTION LOOKING DOWNSTREAM
HORIZ 1" = 20'
VERT 1" = 20'

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EXISTING SECTIONS

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PROJECT NUMBER
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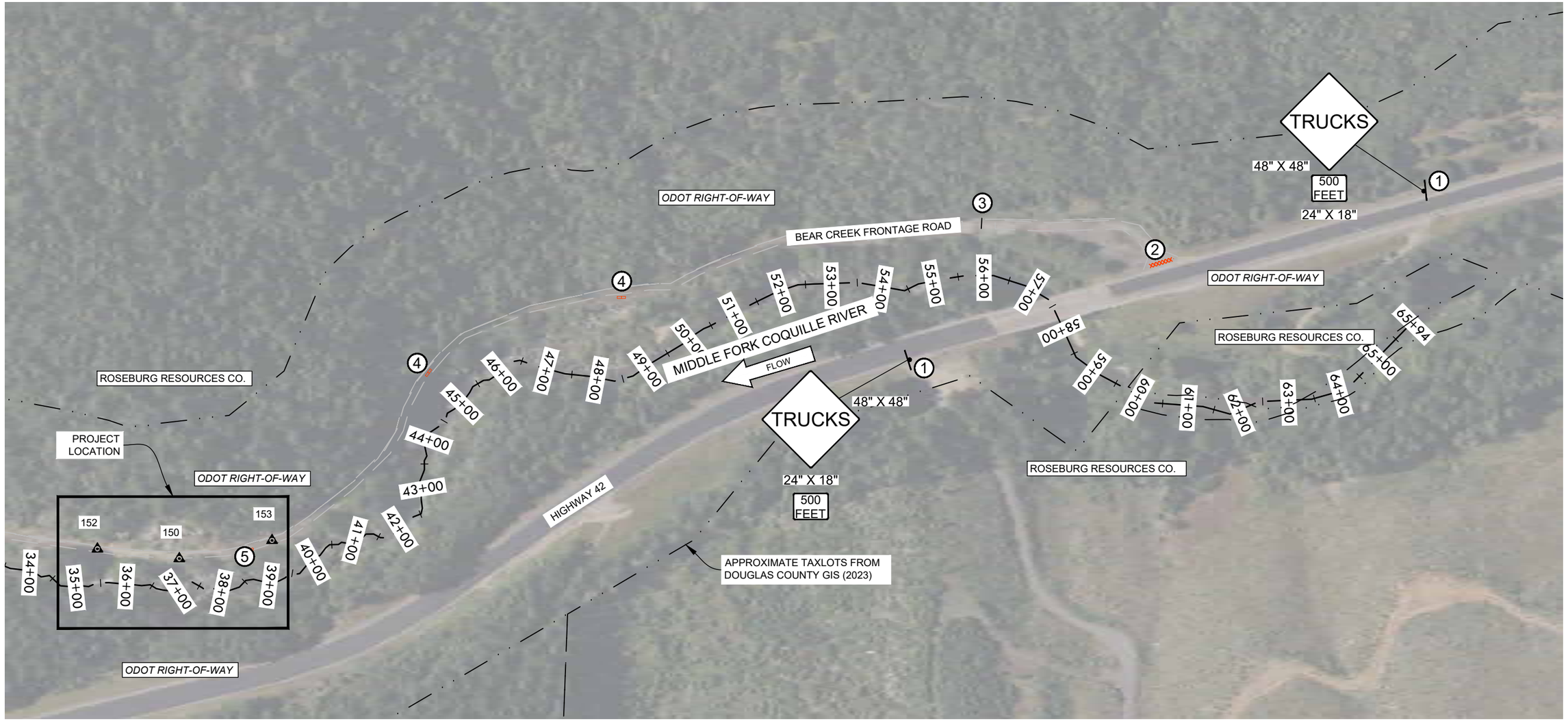
DRAWING NUMBER
2.1



1 SITE ACCESS PLAN

1" =200'

SITE ACCESS NOTES

1. SITE ACCESS SHALL OCCUR WITHIN OREGON DEPARTMENT OF TRANSPORTATION RIGHT-OF-WAY FROM HIGHWAY 42 AND ALONG BEAR CREEK FRONTAGE ROAD.
2. CONTRACTOR SHALL SUBMIT TRAFFIC CONTROL AND SITE ACCESS PLAN FOR APPROVAL PRIOR TO CONSTRUCTION.
3. CONTRACTOR MAY USE WEST END OF BEAR CREEK FRONTAGE ROAD FOR EQUIPMENT TURNAROUND. EXISTING CONCRETE BARRIERS AT WEST END SHALL REMAIN IN PLACE. BEAR CREEK FRONTAGE ROAD DOWNSTREAM (WEST) OF PROJECT AREA MAY BE BLOCKED BY ROCKFALL AND DEBRIS; CONTRACTOR SHALL UTILIZE ROAD DOWNSTREAM (WEST) OF PROJECT AREA AT THEIR OWN RISK AND AT NO ADDITIONAL EXPENSE TO COQUILLE WATERSHED ASSOCIATION.
4. EXISTING ROADWAYS SHALL BE RESTORED TO PRE-PROJECT OR BETTER CONDITIONS AT COMPLETION OF PROJECT.
5. SALVAGE ANY WOODY MATERIAL REMOVED DURING TEMPORARY ACCESS AND STAGE FOR RE-USE IN SITE RESTORATION (SEE DRAWING 4.0).

CONSTRUCTION NOTES

1. INSTALL 48 INCH "TRUCKS" SIGN WITH 18 INCH "500 FEET" RIDER PER ODOT AND MUTCD STANDARDS ALONG HIGHWAY 42 EACH SIDE OF ACCESS POINT. SIGN SHALL BE INSTALLED ON 4" X 6" WOOD POST PER TEMPORARY SIGN PLACEMENT ODOT STANDARD DETAIL TM821 AND WOOD POST SIGN SUPPORTS STANDARD DETAILS TM 670, TM671. REMOVE SIGNS AT PROJECT COMPLETION.
2. REMOVE APPROX. 50 LF OF EXISTING GUARDRAIL AND PROTECT ENDS (SEE DRAWING 2.3). REPLACE GUARDRAIL AT PROJECT COMPLETION AND RESTORE TO PRE-PROJECT CONDITIONS OR BETTER.
3. INSTALL TEMPORARY CULVERT CROSSING (18-IN. DIA. MIN., APPROX. 20 LF) ACROSS DRAINAGE (SEE DRAWING 2.4). FIBER OPTIC LINE MONITOR MUST BE PRESENT DURING CULVERT PLACEMENT AND REMOVAL.
4. PROTECT EDGE OF EXISTING PAVEMENT WITH APPROX. FOUR 4-FT X 8-FT (MIN.) STEEL PLATES (SEE DRAWING 2.7).
5. CONSTRUCT TEMPORARY CHANNEL ACCESS (SEE DRAWING 2.5). FIBER OPTIC LINE MONITOR MUST BE PRESENT DURING CONSTRUCTION OF TEMPORARY CHANNEL ACCESS.

811 Know what's below. Call before you dig.

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SITE ACCESS PLAN

MIDDLE FORK COQUILLE RIVER FISH PASSAGE
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1 GUARDRAIL REMOVAL PLAN

LOOKING NORTHWEST FROM WESTBOUND HIGHWAY 42 TOWARDS BEAR CREEK FRONTAGE ROAD. NOT TO SCALE.

GUARDRAIL REMOVAL NOTES

1. GUARDRAIL REMOVAL AND REINSTALLATION SUBJECT TO ODOT APPROVAL PRIOR TO IMPLEMENTATION.
2. PROTECT EXISTING GUARDRAIL FROM DAMAGE OR DISTORTION. DAMAGED GUARDRAIL SHALL BE REPLACED AT NO ADDITIONAL COST TO THE CONTRACTING AGENCY.

CONSTRUCTION NOTES

1. DISCONNECT GUARDRAIL SECTION AND REMOVE POST. SAVE GUARDRAIL FOR REINSTALLATION AT PROJECT COMPLETION.
2. INSTALL W-BEAM TYPE B END PIECE AT EXPOSED ENDS OF REMAINING GUARDRAIL (SEE ODOT STANDARD DRAWING RD417).
3. AT PROJECT COMPLETION, INSTALL NEW POSTS AND RECONNECT SALVAGED GUARDRAIL (SEE ODOT STANDARD DRAWINGS RD403 AND RD407).

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GUARDRAIL REMOVAL DETAILS

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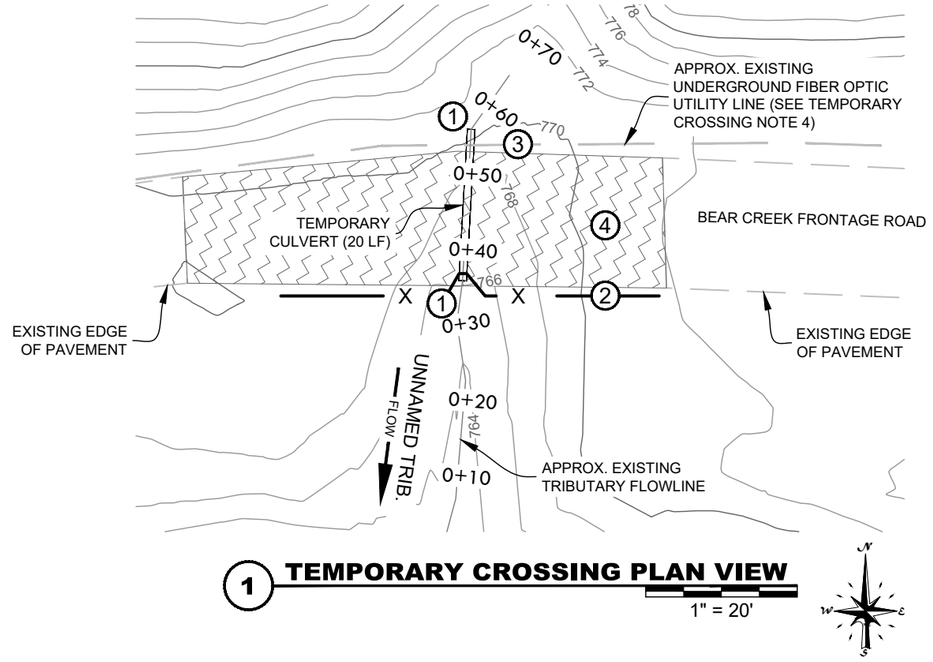
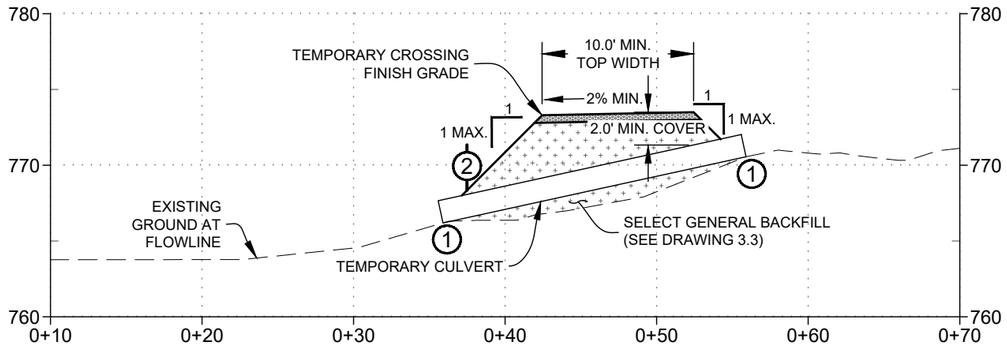
2.3



1 TEMPORARY CROSSING PLAN VIEW

1" = 20'



2 TEMP. CROSSING PROFILE

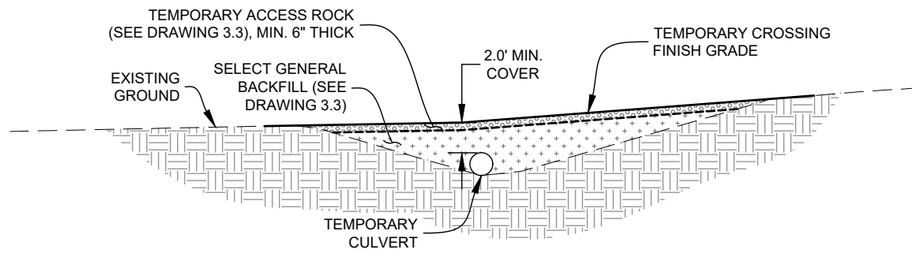
HORIZ 1" = 10'
VERT 1" = 10'

TEMPORARY CROSSING NOTES

1. TEMPORARY CROSSING OF THE UNNAMED TRIBUTARY TO THE MIDDLE FORK COQUILLE RIVER SHALL SUPPORT HS20 LOADING.
2. TEMPORARY CULVERT SHALL BE 18-INCH MIN. DIAMETER.
3. CONTRACTOR SHALL SUBMIT TEMPORARY CROSSING PLAN FOR REVIEW AND APPROVAL BY THE ENGINEER PRIOR TO IMPLEMENTING TEMPORARY CROSSING. CONTRACTOR MAY PROPOSE TEMPORARY BRIDGE CROSSING STRUCTURE IN LIEU OF TEMPORARY CULVERT.
4. FIBER OPTIC LINE MONITOR MUST BE PRESENT DURING CROSSING PLACEMENT AND REMOVAL.

CONSTRUCTION NOTES

1. INSTALL TEMPORARY CULVERT, MATCH EXISTING TRIBUTARY CHANNEL ELEVATIONS UPSTREAM AND DOWNSTREAM OF THE TEMPORARY CROSSING. PROTECT THE CROSSING OUTFALL FROM EROSION AND SCOUR WITH TEMPORARY QUARRY SPALLS SPLASH PAD, WOODY MATERIAL, OR PLYWOOD SPLASH BOARD.
2. INSTALL SILT FENCE OR APPROVED EQUIVALENT AT TOE OF TEMPORARY CROSSING EMBANKMENT (SEE DRAWING 2.7).
3. PROTECT EXISTING UNDERGROUND FIBER OPTIC LINE DURING CONSTRUCTION AND REMOVAL OF TEMPORARY CROSSING. CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF LINE PRIOR TO CONSTRUCTION.
4. AT COMPLETION, REMOVE TEMPORARY CROSSING AND TEMPORARY EROSION AND SCOUR COUNTERMEASURES. RESTORE EXISTING CHANNEL OF THE UNNAMED TRIBUTARY TO THE MIDDLE FORK COQUILLE RIVER TO PRE-PROJECT OR BETTER CONDITIONS AT COMPLETION OF PROJECT (SEE DRAWING 4.0).



3 TEMP. CROSSING TYPICAL SECTION

HORIZ 1" = 10'
VERT 1" = 10'

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TEMPORARY CROSSING

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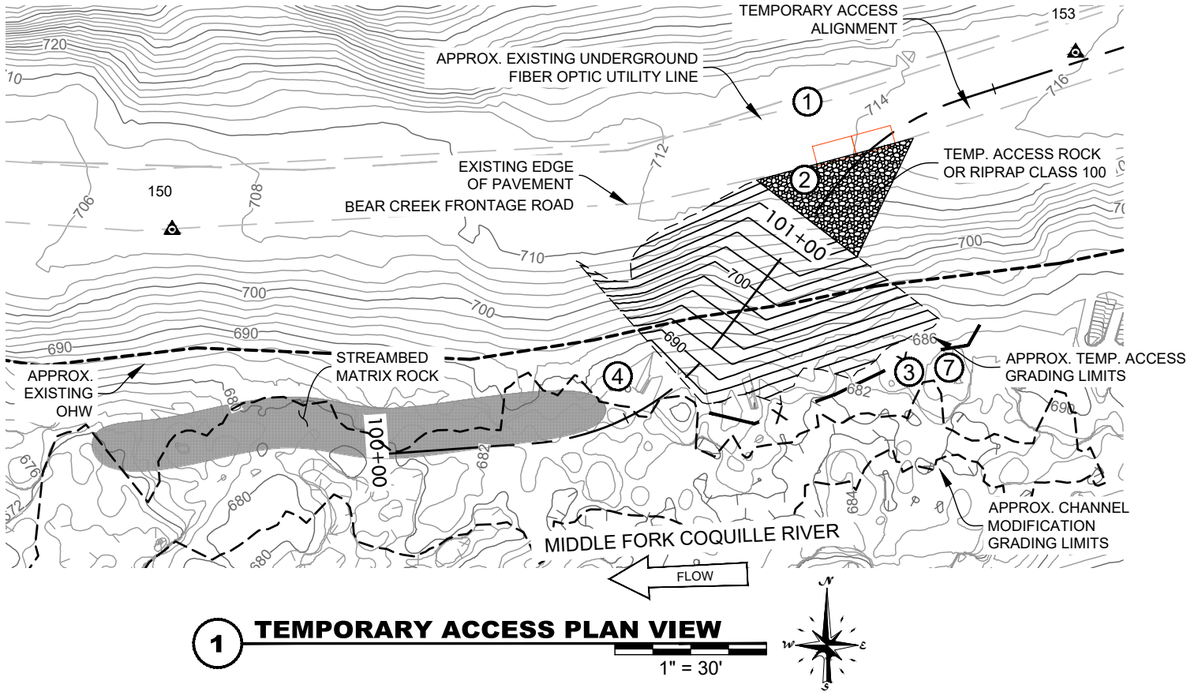
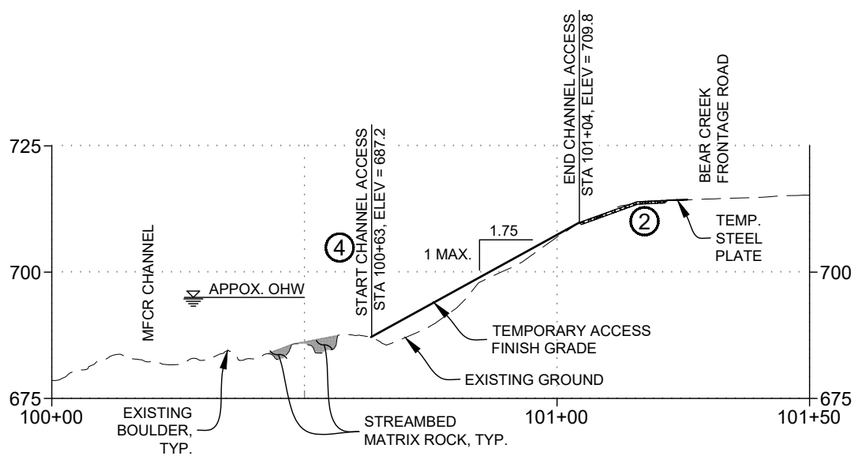


1 TEMPORARY ACCESS PLAN VIEW

1" = 30'



2 TEMP. CHANNEL ACCESS PROFILE

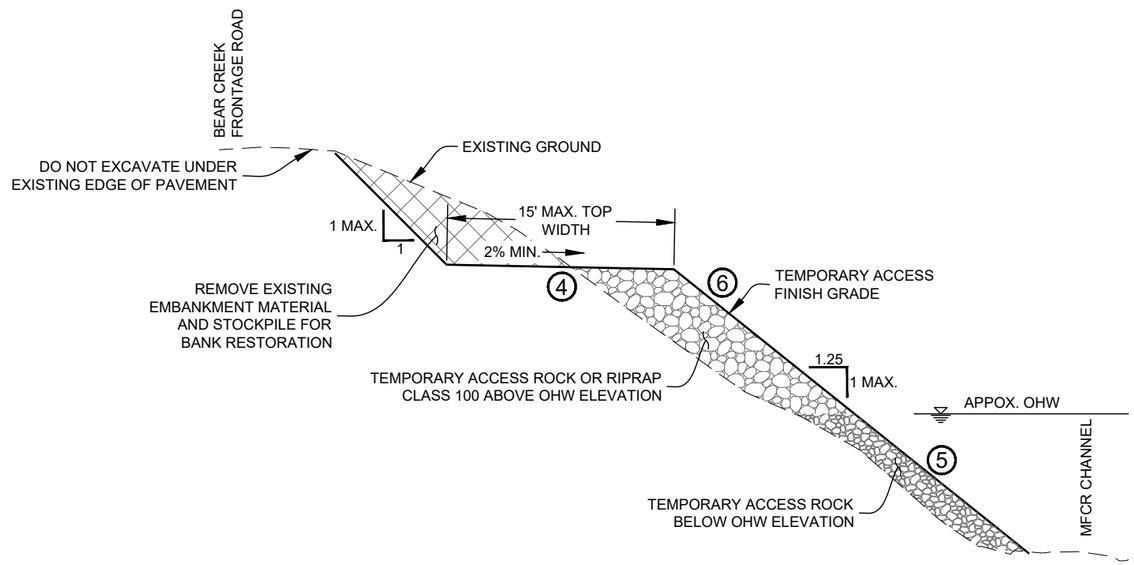
HORIZ 1" = 30'
VERT 1" = 30'

TEMPORARY CHANNEL ACCESS NOTES

1. TEMPORARY ACCESS INTO THE MIDDLE FORK COQUILLE RIVER CHANNEL SHALL SUPPORT A 35,000 LB. TRACKED EXCAVATOR OR EQUIVALENT.
2. CONSTRUCT TEMPORARY CHANNEL ACCESS BELOW THE ORDINARY HIGH WATER (OHW) ELEVATION WITH TEMPORARY ACCESS ROCK (SEE DRAWING 3.3). TEMPORARY CHANNEL ACCESS ABOVE OHW ELEVATION MAY USE RIPRAP CLASS 100 (SEE DRAWING 3.3) OR TEMPORARY ACCESS ROCK.
3. TEMPORARY CHANNEL ACCESS SHALL BE MAINTAINED IN A FIRM AND UNYIELDING CONDITION FOR THE DURATION OF CONSTRUCTION.
4. CONTRACTOR SHALL SUBMIT TEMPORARY CHANNEL ACCESS PLAN FOR REVIEW AND APPROVAL BY THE ENGINEER PRIOR TO IMPLEMENTING TEMPORARY CHANNEL ACCESS.

CONSTRUCTION NOTES

1. PROTECT EXISTING UNDERGROUND FIBER OPTIC LINE DURING CONSTRUCTION AND REMOVAL OF TEMPORARY CHANNEL ACCESS. CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF LINE PRIOR TO CONSTRUCTION.
2. PROTECT THE EDGE OF EXISTING PAVEMENT ON BEAR CREEK FRONTAGE ROAD WITH STEEL PLATES (SEE DRAWING 2.7). DO NOT EXCAVATE OR REMOVE PAVEMENT IN BEAR CREEK FRONTAGE ROAD. PROTECT EDGE OF EMBANKMENT WITH 6" MIN. THICKNESS OF TEMPORARY ACCESS ROCK OR RIPRAP CLASS 100.
3. INSTALL ±60 LF SILT FENCE (SEE DRAWING 2.7) OR APPROVED EQUIVALENT AT TOE OF TEMPORARY ACCESS EMBANKMENT.
4. CONSTRUCT TEMPORARY CHANNEL ACCESS PER PLAN, PROFILE AND SECTION THIS DRAWING. PROTECT EXISTING VEGETATION OUTSIDE OF TEMP. ACCESS GRADING LIMITS. PLACE STREAMBED MATRIX ROCK (SEE DRAWING 3.3) IN CHANNEL AND BETWEEN BOULDERS AS NEEDED TO ACCESS CHANNEL MODIFICATION WORK AREA (SEE DRAWING 3.0).
5. SHAPE MATERIALS BELOW OHW TO SMOOTHLY TRANSITION TO BANK CONTOURS UPSTREAM AND DOWNSTREAM.
6. OBLITERATE TEMPORARY CHANNEL ACCESS AND REMOVE MATERIALS ABOVE OHW UPON COMPLETION OF IN-WATER WORK.
7. REMOVE SILT FENCE AND REVEGETATE BANK AFTER CONSTRUCTION IS COMPLETE (SEE DRAWING 4.0).



3 TEMP. ACCESS TYPICAL SECTION

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VERT 1" = 10'

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TEMPORARY CHANNEL ACCESS

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