

14.0 In-Water Work

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14.0 In-Water Work

Chapter Summary

- Describe specific methods, materials, and techniques of in-water construction elements of the project.
- Describe the duration and logistics of proposed in-water work.
- Discuss the timing of in-water work in relation to the presence of different life stages of listed species within the project action area, and also in relation to the in-water work windows stipulated by the WDFW area habitat biologist or the hydraulic project approval (HPA).
- Quantify anticipated impacts associated with the proposed activities.
- Describe stream bypass and fish handling or exclusion methods, if applicable.
- Discuss the extent of potential direct and indirect effects of proposed actions on habitat and various life stages of fish species that are present.
- When assessing impacts, consider impact minimization measures and BMPs that will be implemented to minimize project impacts.
- See guidance at the end of this chapter for effect determination considerations; also see PART 2: EFFECT DETERMINATION GUIDANCE.

14.1 General Considerations

This chapter provides general guidance on how to approach the analysis of effects associated with in-water work, general information and resources for understanding in-water work issues and activities, and specific guidance for making effect determinations pertaining to in-water work.

Frequently, BAs lack sufficient information regarding proposed in-water work. It is essential that the discussion of in-water elements of a proposed project consider the following issues:

- Discuss specific methods of in-water construction.
- Discuss methods for determining culvert size.
- Discuss the duration of in-water work.

- Discuss the location of machinery, equipment, and staging areas in relation to the stream channel.
- Provide the amount of material to be placed along the channel banks and the amount of material to be placed within the wetted channel (e.g., fill, large woody debris, or boulders).
- Discuss whether piles will be driven by vibratory or impact methods.
- Describe stream bypass methods.
- Discuss the extent of riparian vegetation removal and ground disturbance proposed in the vicinity of the water resource.
- Discuss the extent of potential direct and indirect effects of proposed actions on habitat and various life stages of fish species present.
- Consider the types of piles proposed and associated potential contaminants: treated wood (e.g., creosote, chromated copper arsenate (CCA), or polycyclic aromatic hydrocarbon compounds [PAHs]), cast-in-place or concrete piles (e.g., pH alterations or lime), or metal (e.g., treated or PVC coatings).
- Consider the impacts of removing piles: in some cases, sawing concrete piles off at the water line rather than at or below the mud line reduces impacts by preventing alterations to the pH of the water body. Removal of treated wood piles may have short-term adverse impacts resulting from the resuspension of contaminants but may improve environmental baseline conditions in the long term.
- Consider whether cofferdams will increase sediment impacts or effectively contain sediments so that sediments can be pumped to infiltration sites. Consider using water sausages to decrease sediment impacts.
- Consider sediment impacts resulting from bank trampling and compaction.
- Consider the impacts resulting from first flush: will the first rains after construction generate sediment loads above the natural disturbance regime, thus constituting an adverse effect?
- Discuss the quantity of sedimentation and dispersion (i.e., will it amount to a teaspoon or a truckload in a small or large system).
- Consider the size of the mixing zone and the behavior of sediments suspended in the water column. How far will sediment impacts extend? Is this extent of impact compatible with Department of Ecology guidelines for mixing zones?

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- Describe conservation and BMP measures that will be implemented to minimize construction-related impacts.
 - Discuss the timing of in-water work in relation to the presence of different life stages of listed species within the project action area.
 - Describe work occurring within the in-water work windows stipulated by the WDFW area habitat biologist or the hydraulic project approval.
 - If the project occurs in a seasonal stream when the channel is dry, describe the cleanup measures and the effect of first-flush impacts.

14.2 Information Resources

Information pertaining to the methods or construction techniques employed for in-water work is available from a number of sources, including but not limited to the sources listed below:

- National Marine Fisheries Service: Anadromous Salmonid Passage Facility Design (2011): Available online at http://www.westcoast.fisheries.noaa.gov/fish_passage/solutions/index.html
- WDFW: Hydraulic Project Approval Code (RCW 75.20 and WAC 220-660). Available online at < [Chapter 220-660 WAC](#):>.
- WDFW: *Water Crossing Design Guidelines*. Available online at < <http://wdfw.wa.gov/publications/01501/> >.
- WDFW: *Integrated Streambank Protection Guidelines*. Available online at < <https://wdfw.wa.gov/publications/00046>>.
- WDFW: *Fishway Design Guidelines for Washington State*. Available online at < <https://wdfw.wa.gov/publications/00048>.
- WDFW: *Incorporating Climate Change into the Design of Water Crossing Structures*. Available online at: <https://wdfw.wa.gov/publications/01867>
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A summary of the activities regulated under the hydraulic code and their WAC citations are provided in Table 14-1. Additional guidelines and white papers referenced in Table 14-1 can be found online at < <https://wdfw.wa.gov/publications> >.

Table 14-1. Activities regulated by the hydraulic code (WAC 220-660).

General WAC Topic	Topic/Activities	WAC Reference	Guidance or Guideline Reference
Bank protection	Bulkheads (lakes), in-stream structures (weirs, spurs, vortex structures, groins, barbs), beach enhancement (lakes), vegetative additions, river channel confinement and construction impacts, levee construction and removal, diversion of floodplain/hyporheic flow (forcing, floodway conveyance, relocation), floodplain fill placement	220-660-130	Integrated Streambank Protection Guidelines (WDFW)
On-water and over-water structures	Docks, piers, floats, rafts, ramps, boat hoists, launches, boathouses, houseboats and associated moorings, marinas, driving or removal of pilings, trash-booms, trash-racks, work-barges, dolphins	220-660-380, 220-660-390, 220-660-400,	Aquatic Habitat Guidelines white papers (WDFW)
Water crossings	Beach access, bridges, fords	220-660-190	Design of Road Culverts for Fish Passage (WDFW)
Culverts	Culverts - new and retrofits		Design of Road Culverts for Fish Passage (WDFW)
Water diversions	Screening devices, damming (small scale), pump intakes	220-660-250	Fishway Design Guidelines, Irrigation and Fish pamphlet (WDFW)
Conduit crossings	Trench cuts, borings, aerial, surface placement	220-660-270, 220-660-440	
Dredging and gravel removal	In-stream sediment sumps, gravel pits, floodplain pits, dredging, gravel removal	220-660-170, 220-660-180, 220-660-410	Aquatic Habitat Guidelines white papers (WDFW)
Felling and yarding of timber	Non-FPA activities in Type 4-5 waters	220-660-280	
Aquatic plant control	Hand pulling, cutting, raking, bottom barriers, weed rollers, mechanical harvesting and cutting, diver dredging, dragline and clamshell dredging, rotovation, chemical controls	220-660-290	Aquatic Plants and Fish pamphlet (WDFW)
Aquaculture	Net pens, shellfish racks, hatchery racks, egg tubes, fish traps (see topics document)	None	
Marine resource issues	Bulkheads, marine beach nourishment, marine shoreline and near-shore activities, estuary restoration, vegetation (eelgrass, kelp beds, wetland, estuary), tidal reference areas, authorized work times	220-660-370, 220-660-310, 220-660-330	Aquatic Habitat Guidelines white papers (WDFW)
Channel design features	Spawning pads; habitat enhancement; off-channel rearing and other ponds; LWM- removal, repositioning, addition; channel changes and realignment; off-channel channels (new floodplain and high flow bypass); gradient control structures	220-660-210, 220-660-220	Macro-Habitat Restoration Techniques, Aquatic Habitat Guidelines white papers, Siting and Design of Off-Channel Rearing Habitat (WDFW)

Mineral prospecting	Panning and high banking, sluicing and dredging	220-660-300	Gold and Fish pamphlet (WDFW)
Stormwater	Quantity, quality, outfalls and other instream structures	220-660-260	Ecology stormwater manual (1992)

The Washington hydraulic code stipulates that all activities that alter the bed or flow of state waters (i.e., all in-water work) require a HPA permit from WDFW. Through the hydraulic code, WDFW is liable under the Endangered Species Act for any *take* that occurs as a result of projects it approves. In an effort to minimize impacts on species and avoid *take*, clear conditions are stipulated in the permits WDFW issues to project proponents, including in-water work windows.

WDFW area habitat biologists currently reference two state pamphlets for general guidance in determining in-water work windows: *Gold and Fish* and *Aquatic Plants and Fish* (see online citation below). The general timing restrictions stipulated in these documents are then modified by area biologists, based on their knowledge or observations of site-specific conditions, in order to provide sufficient habitat protection and minimize potential impacts on species.

The *Gold and Fish* pamphlet is available online at < <https://wdfw.wa.gov/publications/02150> >.

The *Aquatic Plants and Fish* pamphlet is available online at < <https://wdfw.wa.gov/publications/01728> >.

By including HPA conditions in the BA impact minimization measures, project impacts can be reduced. However, the timing of the in-water work window as defined by WDFW in an HPA can differ from the window defined by NMFS and USFWS, because the guidance used by WDFW habitat biologists in determining in-water work windows has not been formally approved by NMFS and USFWS. The guidance used by state biologists emphasizes the sensitive periods for all species that WDFW addresses, not just listed fish species, and is generally provided at the county level, although more specific windows have been defined for some basins and subbasins.

In contrast, the work windows defined by biologists from the Services focus upon sensitive periods and the presence of listed fish species in watercourses. It is important that the BA report the in-water work window that has been approved by all three agencies (USFWS, NMFS, and WDFW). This is the window that must be included in the special provisions. Any changes to the in-water work window proposed by the project must be approved by all three agencies.

14.3 Guidance for Effect Determinations Pertaining to In-Water Work

WSDOT has developed guidance for effect determinations related to in-water work activities. The following information is intended as guidance only and has not been uniformly accepted by the Services as providing adequate coverage for listed species or critical habitats. In addition, site-specific conditions largely determine the types and extent of impacts that will result from in-water work activities. As a result, there likely will be significant variation in the effect determinations generated for different projects.

Work conducted within the wetted channel of a riparian system or in marine waters can be expected to result in impacts on surrounding habitats and species in virtually every case. Consequently, the most common effect determinations for in-water work are *not likely to adversely affect* and *likely to adversely affect*. The effect determinations recommended below for in-water work are project-specific and may not apply to every project.

Determination of No Effect for In-Water Work Projects

Projects that include in-water work will have *no effect* on listed fish species if the following condition is met:

- Work occurs outside a WRIA with a listed fish evolutionarily significant unit (ESU) or distinct population segment (DPS), or in WRIsAs containing no listed fish species.

Determination of May Affect but Is Not Likely to Adversely Affect for In-Water Work Projects

Projects that include in-water work *may affect but are not likely to adversely affect* listed fish species if the following conditions are met:

- For work below the OHWM to replace or extend culverts: no ESA-listed species are present in the system during the approved work window, and no spawning habitat will be disturbed.
- All work is conducted within the WDFW stipulated in-water work window (in accordance with the *Gold and Fish* rule or a HPA permit). This does not apply to locations that may provide rearing habitat for steelhead.
- All work occurs outside rearing and spawning areas.
- The project does not degrade the environmental baseline.

Determination of May Affect and Is Likely to Adversely Affect for In-Water Work Projects

Typically, projects that include in-water work *may affect and are likely to adversely affect* listed fish species under the following conditions:

- The project requires work in water where resident steelhead, residual Chinook salmon or other rearing listed salmonids are present.
- The project requires moving or handling listed fish species.
- The project requires in-water work and has the potential for a direct *take* of listed species, including electrofishing or handling of listed fish.
- The project involves disturbance or filling of wetlands that are hydrologically connected (i.e., have a seasonal surface flow connection) to salmonid-bearing streams and provide rearing or refugia habitat for listed salmonids, whose habitat is in short supply in the watershed.
- The project requires blasting to remove slide material, and there is a high potential for materials to enter listed fish-bearing waters when listed fish are likely to be present.

Scheduling work within the WDFW published or approved work window does not necessarily ensure that the proposed timing of the project will be accepted by the Services. The Service biologists and reviewers should be consulted prior to completion of a BA to ensure that optimal timing for in-water work is used.

In addition, there is some debate within the Services regarding how to adequately demonstrate any degradation of the environmental baseline in relation to a project action area. The project biologist should identify the environmental characteristics of the project action area and consider all possible effects upon those current conditions that may result from project activities. Whenever possible, effects of a proposed action should be qualitatively or quantitatively described to provide reviewers with a clear sense of the potential for project-related impacts to affect baseline conditions and the extent of those impacts.

If listed fish species are present in the project action area during construction, or if rearing or spawning habitat is present and will be damaged or affected by project activities, it is extremely likely that in-water work will warrant a *likely to adversely affect* determination. In listed bull trout spawning subwatersheds, the presence of bull trout can be assumed year-round due to the variety of life history forms that exist.

14.4 Fish Removal or Exclusion

Because in-water work often necessitates the exclusion or removal of fish from the project construction area, Federal resource agencies expressed an interest in WSDOT developing a work area isolation/fish removal protocol for agency activities where fish removal may be necessary. The WSDOT Fish Removal Protocols and Standards was developed to standardize WSDOT's activities when they are required to remove fish from work areas.

Projects with fish moving or exclusion activities should include the most recent protocol as an appendix to a BA. In some situations, the protocol may not apply or may be modified in emergency situations or in certain areas that have unique site-specific characteristics.

The WSDOT *Fish Exclusion Protocols and Standards* is available online at <https://wsdot.wa.gov/engineering-standards/design-topics/environment/environmental-disciplines/fish-wildlife/endangered-species-act-and-essential-fish-habitat/biological-assessment-preparation-manual-template>

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