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Fishways, Flow, and Screening Proposed Rule

Small Business Economic Impact Statement

Final Report | May 31, 2023

prepared for:

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LIST OF ACRONYMS AND ABBREVIATIONS

HOA	Homeowner Association
HPA	Hydraulic Project Approval
NAICS	North American Industrial Classification System
ORIA	Office for Regulatory Innovation and Assistance
RCW	Revised Code of Washington
RFA	Regulatory Fairness Act
SBEIS	Small Business Economic Impact Statement
WAC	Washington Administrative Code
WDFW	Washington State Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation

EXECUTIVE SUMMARY

The Washington State Department of Fish and Wildlife (WDFW) is developing a proposed rule that would codify existing design standards for diversion screens and fish passage, introduce a climate adapted design standard for water crossings, and outline procedures for supporting and achieving compliance with the regulatory requirements. This Small Business Economic Impact Statement (SBEIS) was developed in accordance with the Regulatory Fairness Act (RFA), Revised Code of Washington (RCW) Section 19.85 to determine whether the rule would result in a disproportionate cost impact on small businesses.

BACKGROUND

Governor Inslee's Southern Resident Orca Task Force identified lack of prey as a major threat to recovery of the Southern Resident orcas within its 2018 report, and recommended that WDFW create rules describing how 77.57 RCW (the Fishways, Flow, and Screening statues) will be implemented and enforced as one part of broader recovery efforts.[1] WDFW's fish passage and screening authority has existed for many decades; however, WDFW has never created a rules chapter describing implementation of the authority. This rulemaking seeks to fill that gap.

In addition to clarifying fish passage and screening design standards, the proposed rule incorporates a requirement for new and replacement water crossing designs to account for projected changes to hydrology as a result of climate change, so that water crossing structures built today will be capable of accommodating stream conditions (and equivalently, providing fish passage) throughout their designed lifespan.

Finally, although RCW 77.57 establishes WDFW's authority to correct structures that are inadequate in terms of fish passage or protection, some of the compliance actions contained in the statute are not considered practical by today's standards and there needs to be a strategic approach to achieving compliance with this law.[2] Accordingly, the proposed rule includes a process and options for WDFW to support and achieve compliance with the proposed rule.

[1] Cascadia Consulting Group. 2018. "Southern Resident Orca Task Force: Report and Recommendations." Accessed October 20, 2022 at: https://www.governor.wa.gov/sites/default/files/OrcaTaskForce_reportandrecommendations_11.16.18.pdf

[2] Throughout this report, we refer to the dams, diversions, fish passage improvement structures, culverts, and crossings that would be subject to regulation under the proposed rule collectively as "structures."

SUMMARY OF PROPOSED RULE

The proposed rule includes three major components as follows:

- Clarifying the applicability of existing fish passage and screening standards, described in WDFW's assessment guidance document and partially codified in the state Hydraulic Code Rules (Chapter 220-660 WAC), including to screening of artificial waterways where fish life concerns exist;
- Requiring new and replacement water crossing structure (i.e., culvert and bridge) designs to consider future bankfull width and 100-year peak flows in parts of the state where they are projected to increase as a result of climate change; and
- Outlining a protocol designed to improve compliance with the existing fish passage and safety standards, effectively operationalizing WDFW's existing authority to identify and correct noncompliant structures.

SUMMARY OF REGULATORY BASELINE

Although there are a large number of privately owned fish passage structures, diversions and fish screens, and culverts and stream crossings across Washington (over 50,000 according to WDFW data),[3] many of these structures would not be affected by the proposed rule for the following reasons:

- Exemptions apply to structures on non-fish bearing streams, on tribal land, obstructions that are federally owned or subject to federal laws that preempt RCW 77.57, agricultural drainage system components installed on or before May 20, 2003, and lawful diversions installed on or before June 11, 1947 in waters containing game fish exclusively.
- The design standards for fish passage and screening incorporated into the proposed rule are already required for most structures under the Hydraulic Code Rules (Chapter 660-220 WAC). Thus, any owners of structures that comply with these existing regulations (e.g., via the HPA permitting process) would not be affected by the proposed rule.
- WDFW already possesses the statutory authority to enforce existing fish passage and screening standards by making the necessary correction and imposing a lien on the structure owner's property (RCW 77.57.040 and RCW 77.57.060).
- WDFW's design standards for climate adapted culverts and stream crossings incorporated into the proposed rule are already made available to the regulated community via the Culverts and Climate Change web tool. While not a baseline regulatory requirement, owners of culverts and stream crossings have a vested interest in ensuring these structures are resilient to the future effects of climate

[3] The true number of structures on the landscape is unknown. WDFW's Fish Passage Barriers Inventory represents the best available data for conducting the SBEIS analysis, but it is known to be incomplete.

change. Therefore, a subset of these structures is likely to comply with the design standards in the baseline, regardless of WDFW's proposed rule.

Despite the existing baseline requirements for fish passage and screening, WDFW is aware that a subset of the regulated population is not currently complying with or not aware of the existing regulatory requirements. WDFW will help the regulated community understand how to voluntarily comply through education and technical assistance. WDFW's intentions are to strategically consider existing non-compliant structures and approach compliance reasonably by considering the nature of fish resources impacted by existing non-compliant structures as well as the quality and quantity of habitat to be gained. Thus, the focus of WDFW's proposed rule is on supporting and enforcing compliance across this population.

CHANGES IN BEHAVIOR GENERATED BY THE PROPOSED RULE

Given the existing requirements and practices in developing and upgrading fish passage and screening structures in the baseline, this analysis finds that the proposed rule is most likely to affect behavior and, therefore, potentially generate costs under the following circumstances:

- *The proposed rule informs the structure owner of the design standards for fish passage and screening structures.* Although these design standards are a baseline legal requirement for most structures even absent the proposed rule, a subset of owners may be unaware of the requirement. The proposed rule may therefore alert owners of these requirements (and the agency actions for noncompliance), triggering compliance and associated costs. While most of these costs can be attributed to existing legal requirements (and not newly mandated by the proposed rules), they are assessed here for a comprehensive review of potential impacts.
- *WDFW identifies a noncompliant structure and makes a correction request.* Despite baseline regulatory requirements, owners may knowingly not comply, for cost or other reasons. While WDFW currently has authority to enforce compliance, it has not asserted this authority when owners have been resistant in the past. Under the proposed rule, however, WDFW reasserts its authority and process for enforcing compliance. Thus, for structures that are not in compliance and WDFW determines are priority projects, the proposed rule would affect behavior and generate costs.
- *Culvert or crossing structure would not meet climate adapted standards.* For owners intending to replace (or build) a water crossing structure and not account for future climate change effects via WDFW's guidance, the proposed rule will require consideration of future climate impacts in the design. Under this circumstance, the rule may affect the planned design in such a way that total costs are increased. However, it is also possible that the proposed rule generates some avoided costs in the long run, as structures not adapted to future climate change are more likely to require repair and replacement.

POTENTIALLY AFFECTED BUSINESSES

The proposed rule regulates structures on the landscape, rather than a particular industry or sector. WDFW maintains a database of known structures. However, it is likely that many structures exist on the landscape that are currently unknown to WDFW, and ownership information provided in the database is insufficient to identify potentially affected businesses.

The structures regulated by the proposed rule are owned and managed by a broad mix of federal, state, and local governments, residential landowners, as well as businesses. While businesses owning land may belong to a wide variety of industries, commercial and industrial, businesses from certain industries may be more likely than others to own particular structure types due to the nature of their operations or scale of landholdings. For example, agricultural businesses are more likely to own diversions and crossings; forestry businesses are more likely to own crossings; and homeowner associations (HOAs, to the extent that they are incorporated and considered a business) may own diversions and crossings in residential landscapes. Nonetheless, this SBEIS provides information on potential costs to small businesses acknowledging that any businesses impacted by the proposed rule could theoretically belong to any industry.

COST OF COMPLIANCE

In situations where the proposed rule generates costs, the potential costs can range widely, mainly depending on structure type, nature of the violation, and site-specific characteristics. At the low end, a small intake pump may require an off the shelf screen. At the other end of the violation spectrum, a severe fish passage violation at a water crossing could necessitate installation of a replacement structure. Because of the high degree of situational variation, our analysis concluded that the compliance costs can range from around one hundred dollars to several million. However, the structures most likely owned by small businesses are unlikely to be on a scale sufficient to generate costs at the higher end. For example, exceptionally large screens costing several million dollars to replace are most likely associated with hydropower production, which are categorically exempt from the proposed rule as federally regulated. Exhibit ES-1 contains a range of cost estimates for replacing each structure type.

EXHIBIT ES-1. CONCEPTUAL COST RANGES FOR REPLACING RELEVANT STRUCTURES

COST CATEGORY	DIVERSION SCREENING (SMALL)	DIVERSION SCREENING (LARGE)	DAM REMOVAL	FISH PASSAGE STRUCTURE	CULVERT	BRIDGE
Permitting, design, and engineering	N/A	$2,000 - $4M	$15,000 - $4M	$30,000 - $400,000	$5,000 - $400,000	$15,000 - $1M
Construction	$100 - $10,000	$50,000 - $400,000	$50,000 - $1.5M	$200,000 - $1.5M	$40,000 - $800,000	$50,000 - $5M
Total	$100 - $10,000	$52,000 - $4.4M	$65,000 - $5.5M	$230,000 - $1.9M	$45,000 - $1.2M	$65,000 - $6M

It is important to note that not all violations will require full replacement of the structure. Additionally, many grant and cost sharing opportunities exist that can potentially offset some portion of the compliance costs borne by owners, such as the Fish Barrier Removal Board, Family Forest Fish Passage Program, and Salmon Recovery Funding Board. For these reasons, the costs provided in Exhibit ES-1 should be considered as contextual information rather than as compliance costs borne by owners.

SUMMARY FINDINGS

The assessment of the magnitude of costs borne by businesses and the potential for disproportionate impacts to small businesses is subject to significant data limitations and uncertainty. For any businesses that incur compliance costs, the costs may exceed the minor cost threshold, depending on the project type and specifications, as well as the industry classification of the affected business. Within any industry and for any particular project, however, the costs are expected to disproportionately impact small businesses. This is because no known relationship exists between drivers of project costs and business size, so cost per $100 of revenue, cost per employee, or cost per labor hour will almost certainly be higher for small businesses.

As the potential exists for more than minor costs to be incurred by businesses as a result of the proposed rule, and because small businesses are expected to be disproportionately impacted in cases where costs are incurred, WDFW has identified several mitigation options to defray the impacts to small businesses. These include a strategic approach to technical assistance or compliance visits based on fish life concerns and the quality and quantity of potential habitat gains, and allowing the possibility for WDFW to defer compliance actions until a later date following identification of a violation. WDFW will also continue development of a robust technical assistance program for owners, additionally being able to identify relevant grant and cost sharing opportunities as appropriate.

CHAPTER 1 | INTRODUCTION

This report evaluates the potential costs to businesses of compliance with a Washington State Department of Fish and Wildlife (WDFW) proposed rule that codifies existing design standards for diversion screens and fish passage, introduces a climate adapted design standard for culverts and crossings, and outlines procedures for achieving voluntary and nonvoluntary compliance. This Small Business Economic Impact Statement (SBEIS) was developed in accordance with the Regulatory Fairness Act (RFA), Revised Code of Washington (RCW) Section 19.85 to determine whether the proposed rule would result in more than minor and disproportionate cost impact on small businesses. The primary sources of information for this analysis include the following:

- Information gathered through outreach to businesses providing the services required by the proposed rule, agencies with potentially similar regulatory authority, and owners (or owner-representatives) of structures that are subject to the proposed rule;
- Geospatial data, including WDFW's Washington State Fish Passage GIS layer, WDFW's Culverts and Climate Change web application, federal and tribal land ownership layers, and land use layers; and
- Targeted literature review of peer-reviewed journal articles.

1.1 NEED FOR THE RULE

Governor Inslee's Southern Resident Orca Task Force identified lack of prey as a major threat to recovery within its 2018 report.[4] One set of recommendations focused on improving habitat for prey species, and recommendation number three in particular suggested that WDFW create rules describing how 77.57 RCW (the Fishways, Flow, and Screening statues) will be implemented and enforced. Subsequently, the state legislature passed Engrossed Substitute House Bill 1109 on July 28, 2019, directing WDFW to initiate the rulemaking process through changes to the operating budget. WDFW's fish passage and screening authority has existed for many decades; however, WDFW has never created a rules chapter describing implementation of the authority. The proposed rule seeks to fill that gap.

In addition, WDFW intends to incorporate new standards for developing climate adapted water crossings. WDFW has invested in research to understand how streams in

[4] Cascadia Consulting Group. 2018. "Southern Resident Orca Task Force: Report and Recommendations." Accessed October 20, 2022 at: https://www.governor.wa.gov/sites/default/files/OrcaTaskForce_reportandrecommendations_11.16.18.pdf

Washington are likely to change as a result of climate change.[5] The new standards seek to act upon this knowledge to ensure that culverts and other water crossing structures built today will accommodate stream conditions throughout their designed lifespan. The climate adapted design standard codified in the proposed rule is also in alignment with a cooperative management agreement between WDFW and tribes established in 2019.

Finally, although RCW 77.57 establishes WDFW's authority to correct structures that are inadequate in terms of fish passage or screening, imposing a correction (and potentially a lien on property) through compulsory process is not WDFW's preferred approach. The proposed rule lays out a process for WDFW to work with the regulated community to bring relevant structures into compliance before utilizing the full range of their authority.

To summarize, WDFW's objectives for this rulemaking include:

1. Creating a new chapter to the Washington Administrative Code describing implementation of RCW 77.57 to improve fish passage and safety throughout the state;
2. Incorporating a new climate adapted standard for culverts and other water crossing structures to ensure that they remain functional throughout their designed lifespan; and
3. Outlining a process intended to enhance compliance with the fish passage and screening standards.

1.2 REQUIREMENTS FOR DEVELOPING AN SBEIS

19.85 RCW requires that the relevant agency prepare an SBEIS if the proposed rule "will impose more than minor costs on businesses in an industry."[6] "Minor cost" is defined in RCW 19.85.020 as a cost per business that is less than 0.3 percent of annual revenue or income, or $100, whichever is greater, or one percent of annual payroll.[7] The guidelines for preparing an SBEIS are included in RCW 19.85.040.[8] This analysis also utilizes the more specific guidance and resources provided by Washington State's Office for Regulatory Innovation and Assistance (ORIA).[9] Per the SBEIS *Frequently Asked Questions* guidance, agencies are required to consider "costs imposed on businesses and

[5] Wilhere, G., et al. 2017. "Incorporating climate change into culvert design in Washington State, USA." Ecological Engineering. http://dx.doi.org/10.1016/j.ecoleng.2017.04.009.

[6] RCW 19.85.030 Agency Rules – Small Business economic impact statement reduction of costs imposed by rule. Accessed November 3, 2022 at: https://app.leg.wa.gov/RCW/default.aspx?cite=19.85.030

[7] RCW 19.85.020 Definitions. Accessed November 3, 2022 at: https://app.leg.wa.gov/rcw/default.aspx?cite=19.85.020

[8] RCW 19.85.040 Small business economic impact statement—Purpose—Contents. Accessed November 3, 2022 at: https://app.leg.wa.gov/RCW/default.aspx?cite=19.85.040

[9] ORIA. 2021. Regulatory Fairness Act Support. Accessed November 3, 2022 at: https://www.oria.wa.gov/site/alias__oria/934/regulatory-fairness-act-support.aspx.

costs associated with compliance with the proposed rules."[10] Agencies are not required under 19.85 RCW to consider indirect costs not associated with compliance with the rule.

1.3 SUMMARY OF THE PROPOSED RULE

WDFW is proposing a new chapter to the Washington Administrative Code (WAC) to describe implementation of the Fish, Flow, and Screening authority (RCW 77.57). One aspect of the rule is to clarify the applicability of existing standards, ensuring that they are applied at all existing and new fishways and diversions governed by RCW 77.57. The proposed rule achieves this goal by carefully defining "fishway" and "watercourse" (and equivalently, "river" and "stream"). In addition, the proposed rule requires new and replacement water crossing designs to consider future projected bankfull width and 100-year peak flows. Climate change impacts stream width and flows heterogeneously throughout Washington, so the consideration of future change should be specific to the project site. Finally, the rule defines a process for WDFW to encourage and enforce compliance among owners. In this section, we summarize how the proposed rule differs from the baseline requirements in Washington regulating fish passage and screening, design of fishways and water diversions, and enforcement (i.e., the "incremental effects" of the proposed rule).

Key components of the proposed rule

- ✓ Does NOT introduce new standards for fish passage and screening, but does clarify their applicability where fish life concerns exist
- ✓ Changes consideration of future climate conditions for water crossing designs from a recommendation to a requirement
- ✓ Establishes a protocol for WDFW to enforce the existing regulations regarding fish passage and protection

1.3.1 FISH PASSAGE AND SCREENING STANDARDS

The proposed rule does not introduce any new or different standards for fish passage or diversion screening. The existing standards for compliant structures are currently described in in the WDFW Fish Passage Inventory, Assessment, and Prioritization Manual and also partially codified in the state Hydraulic Code Rules (WAC 220-660). The existing Hydraulic Code Rules only apply to new hydraulic projects that "use, divert, obstruct, or change the natural flow or bed of any salt or fresh waters of the state."[11] The Hydraulic Code was designed to protect fish life in the face of construction projects. It also included standards about fish passage and protection for many years but does not apply to structures not actively being built, replaced, or rehabilitated. This leaves out a

[10] WA Attorney General Office. 2021. Small Business Economic Impact Statements – Frequently Asked Questions. Accessed November 3, 2022 at: https://www.oria.wa.gov/Portals/_oria/VersionedDocuments/RFA/Regulatory_Fairness_Act/DRAFT_SBEIS_FAQ.pdf.

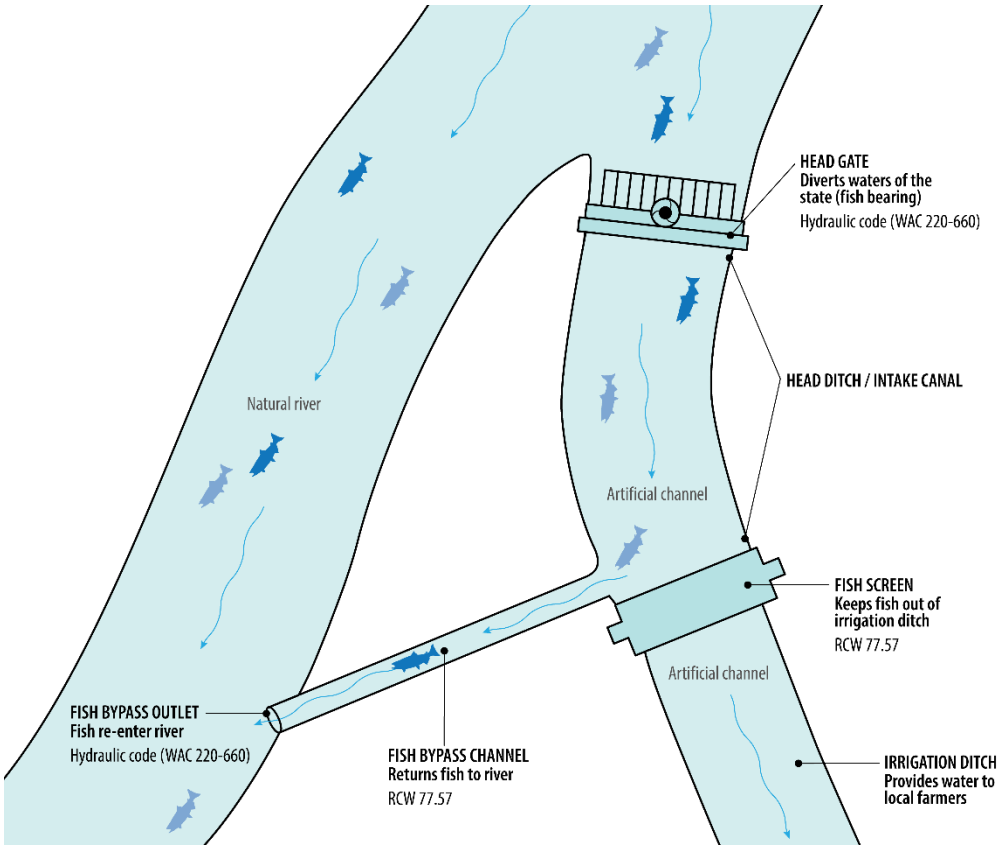
[11] WAC 220-660-010. Hydraulic Code Rules—Purpose. Accessed November 11, 2022 at: https://app.leg.wa.gov/WAC/default.aspx?cite=220-660-010

subset of structures which fall under WDFW's Fishway, Flow, and Screening statutory authority (RCW 77.57) but are not subject to the Hydraulic Code.

The proposed rule clarifies that the existing standards apply to the full set of structures subject to RCW 77.57 by: (1) defining "fishway" to include both fish passage improvement structures (e.g., fish ladders) and all structures that span over, through, or under a watercourse; and (2) defining "watercourse", "river", or "stream" to include all surface-water-connected wetlands that provide or maintain habitat that supports fish life.

The main implication of this clarification is that all aspects of water diversions that incorporate an artificial waterway will be subject to the fish passage and screening standards (e.g., the fish screen and fish bypass channel in Exhibit 1-1). Most other structures on the landscape are already subject to the standards included in the proposed rule through the state Hydraulic Code, except where Hydraulic Code authority does not apply, such as wholly artificial waterways.

EXHIBIT 1-1. WATER DIVERSION DESIGN INCORPORATING AN ARTIFICIAL WATERWAY



1.3.2 CLIMATE ADAPTED CULVERTS AND CROSSINGS REQUIREMENT

The proposed rule requires new and replacement water crossing designs to consider future climate conditions. As mentioned, existing design standards for water crossing structures are codified in WAC 220-660. The existing code requires bridge designs capable of passing 100-year flood flows and accounting for expected lateral stream migration. For culverts, the existing code requires a stream simulation design with the bed width determined by any WDFW-approved design methodology or with an approved alternative plan on a case-by-case basis.

The proposed rule requires consideration of projected future bankfull width and 100-year peak flow. Projected changes to bankfull width and peak flows can be obtained using the Culverts and Climate change web application located on the WDFW website,[12] or any comparable method. For a user-provided point on the landscape (i.e., a culvert or crossing site), the tool calculates the upstream watershed and outputs an expected percentage change to bankfull width and 100-year peak flows based on hydrologic analysis of ten climate model projections.[13,14]

Importantly, climate impacts vary across the state. Some areas are expected to experience large increases to bankfull width and peak flow, while others are expected to experience decreases. If the tool projects anything less than a five percent increase, no further consideration of climate is required. For sites expected to experience greater than five percent increases to bankfull width or peak flow, the projected values for those parameters should be considered as inputs into the overall design process.

Culverts and crossings installed prior to the adoption of the proposed rule will not be subject to the climate adaptation requirement, as long as they are functioning as originally intended, and meet the existing fish passage requirements.

Additionally, outreach to professional firms performing the design and engineering of culverts and bridges generally indicated some degree of baseline consideration for future climate impacts. Some firms reported already using the Culverts and Climate Change tool, while others applied some rule of thumb, such as the Washington State Department of Transportation (WSDOT) standard of increasing current bankfull width by 20 percent and adding two feet. Such rules of thumb may meet the climate adapted standard in the proposed rule for some, but not all cases. The baseline for this requirement, therefore, is project specific.

1.3.3 COMPLIANCE PROCEDURES

The Fishways, Flow, and Screening statute (RCW 77.57) grants WDFW the authority to enforce compliance with fish passage and screening standards by requiring correction. This can involve WDFW taking possession of a diversion device and closing it until

[12] The tool can be accessed at: https://wdfw.wa.gov/species-habitats/habitat-recovery/fish-passage/climate-change

[13] Wilhere, G., et al. 2017."Incorporating Climate Change into the Design of Water Crossing Structures – Final Project Report". Washington Department of Fish and Wildlife.

[14] Wilhere, G. et al. 2017. "Incorporating climate change into culvert design in Washington State, USA." Ecological Engineering.

properly equipped, removing an obstruction, or installing a fishway at the owner's expense.

The proposed rule seeks to enhance the rate of compliance with existing fish passage standards through three main avenues : (1) by raising awareness for the issue through the rulemaking process itself, (2) by providing technical assistance and directing owners toward grant and other cost-sharing opportunities, and (3) by exercising legal authority in extreme cases when other voluntary compliance measures fail. If in such an extreme case WDFW exercises authority to impose a fish passage or screening correction, any costs incurred by WDFW to bring a site into compliance with the fish passage and screening standards would then constitute the value of a lien on the structure or the property on which it is located, with some exceptions. By creating voluntary compliance and technical assistance avenues, the rule seeks to minimize the likelihood of incidents where WDFW would have no choice but to resort to the existing statutory remedies.

The specific enforcement protocols are similar to those in the Hydraulic Code compliance program, essentially outlining a series of protocols for WDFW to operationalize the authority granted in RCW 77.57 to ensure compliance with fish passage standards. The compliance and enforcement provisions included in the proposed rule are as follows:

- A technical assistance visit, requested by either the owner or WDFW. If the technical assistance visit identifies inadequate fish passage or protection, WDFW will develop a voluntary correction request or mandatory notice to comply, depending on the circumstances.
- A compliance inspection site visit may be conducted if WDFW becomes aware of a non-compliant structure, considering the nature of the fish resources impacted by the existing non-compliant structure as well as the quality and quantity of habitat to be gained. WDFW may issue a correction request or a notice to comply at a compliance inspection site visit.
- In either a technical assistance visit or a compliance inspection visit, WDFW will only issue a mandatory notice to comply without first issuing a correction request if there is a history of similar violations by the owner of the diversion or structure, or a probability of causing more than minor harm to fish life.
- Failure to respond to the correction request triggers WDFW to issue a notice to comply.
- Failure to comply with the notice to comply can result in criminal enforcement actions, such as an action to classify noncompliant structure as a public nuisance, resulting in injunctive action, or misdemeanor charges under RCW 77.57.
- As a final resort, WDFW can impose the correction as permitted in the existing statutory remedies. In some cases, WDFW may place a lien on the structure or the owner's property to recoup the cost.

1.4 CONCEPTUAL MODELS OF RULE IMPACTS

As described in the previous section, the standards for fish passage contained in the proposed rule are not new. Therefore, structures on the landscape may already comply, and thus be unaffected by the proposed rule. We developed conceptual models to more precisely identify situations in which the proposed rule would generate changes in behavior that generate costs. We present separate conceptual models for: (1) dams, diversions, and fish passage improvement structures; and (2) culverts and crossings, as these structures have an additional climate adapted design requirement in addition to the existing fish passage standards.

The proposed rule potentially impacts businesses owning structures in the following limited circumstances:

- ✓ New information (from the rule) prompts a noncompliant owner to comply with fish passage standards
- ✓ WDFW identifies a noncompliant structure on the owner's property and requests a correction
- ✓ An owner would plan to build (or modify) a water crossing WITHOUT considering future climate conditions absent the rule

1.4.1 DAMS, DIVERSIONS, AND FISH PASSAGE IMPROVEMENT STRUCTURES

Exhibit 1-2 considers how the proposed rule would affect any particular dam, diversion, or fish passage structure that exists on the landscape. Generally, the logic of the model flows from the fact that the proposed rule does not impose new standards for fish passage and screening beyond what is already partially codified in the Hydraulic Code and described in WDFW's assessment guidance document..

First, exempt structures are not affected. Second, it is possible that an owner would plan to achieve compliance with the existing standard regardless of whether the proposed rule is adopted or not. Third, some structures are already in compliance, and others will not be prioritized by WDFW for correction.

Accordingly, the rule is most likely to generate costs for owners of dams, diversions, and fish passage improvement structures under the following circumstances:

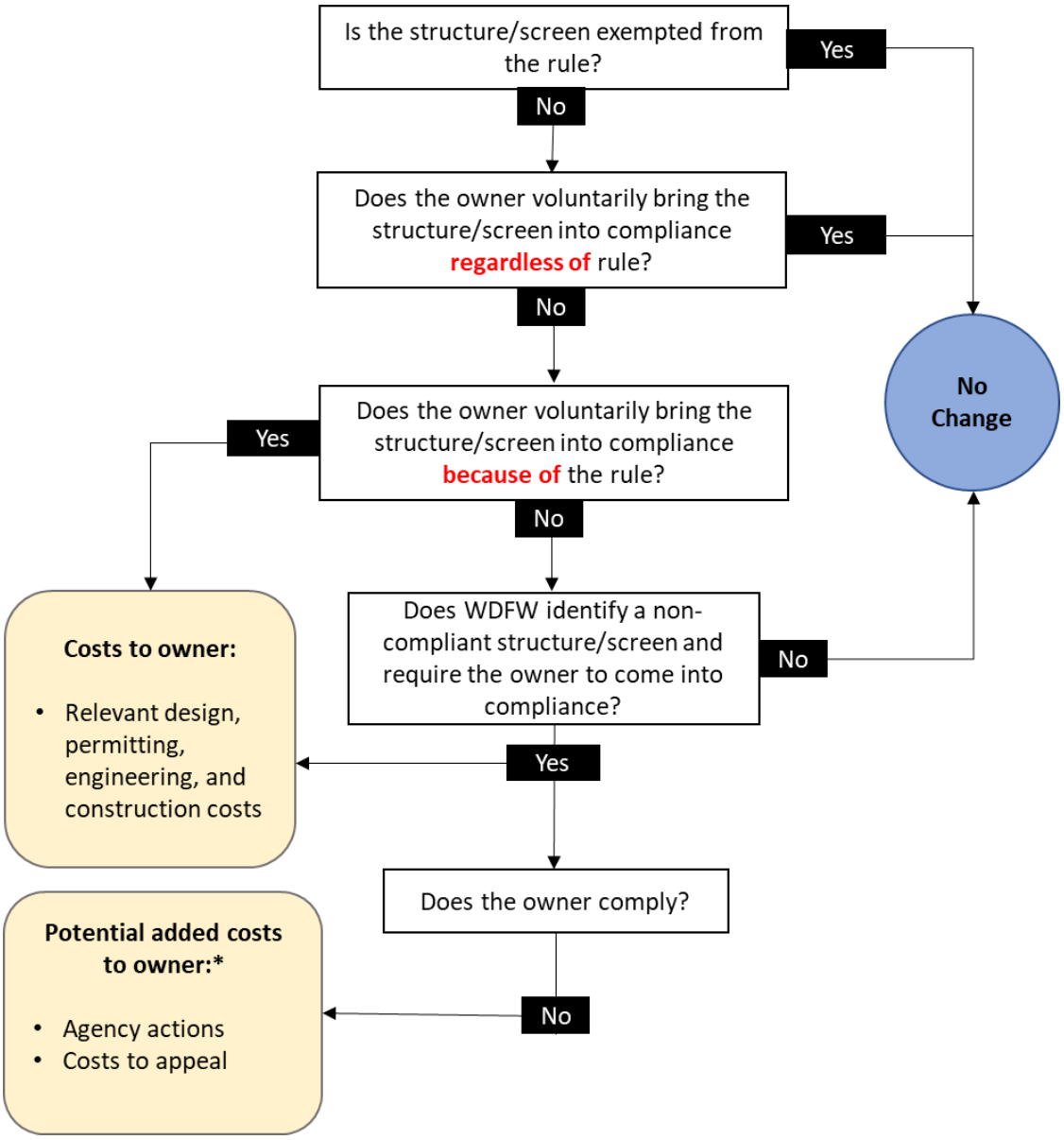
- *New information that triggers action on the part of owners to bring a structure into compliance.* The proposed rule could raise awareness regarding the requirement for owners to provide adequate fish passage and screening, including at sites that do not fall under HPA authority (e.g., artificial waterways). Costs incurred to comply would be triggered by the new rule in this case because owners would not be bearing the costs but for adoption of the rule. These costs, which include all aspects of bringing the noncompliant structure into compliance (e.g., permitting, design, construction) may be borne by the owner in whole or in part (if offset by grant or cost share opportunities).

- *Noncompliant structures subject to WDFW inspection.* As reinforced in the proposed rule, WDFW has authority to visit streams across Washington State to identify noncompliant structures and enforce compliance. Upon completion of the rule, WDFW will prioritize sites for inspection and target compliance where needed. Costs to bring these noncompliant structures into compliance (e.g., permitting, design, construction) will ultimately be borne in whole or in part by the owners. Beyond the compliance costs, owners may bear additional costs if they refuse to comply. Potential costs of noncompliance include any costs associated with enforcement actions initiated by WDFW and/or any costs associated with appealing WDFW actions. While costs of noncompliance are not part of the analysis required for the RFA,[15] they are mentioned here to provide a complete picture of the compliance and rule enforcement process given that a focus of the proposed rule is to clarify WDFW's existing authority to address noncompliance through enforcement.

The conceptual model reveals two main conclusions. First, only a portion of the noncompliant dams, diversions, and fish passage improvement structures on the landscape will experience added costs as a result of the proposed rule. Second, the costs associated with the proposed rule include all aspects of bringing a noncompliant structure into compliance (e.g., permitting, design, construction). As described in Section 2.2, the nature and magnitude of these costs will be site specific, depending on the structure type and nature of the violation, among other things.

[15] RCW 19.85.040 – Small business economic impact statement—Purpose—Contents: "It [the SBEIS] shall analyze the costs of compliance for businesses required to comply with the proposed rule adopted pursuant to RCW 34.05.320, including costs of equipment, supplies, labor, professional services, and increased administrative costs."

EXHIBIT 1-2. CONCEPTUAL MODEL OF RULE IMPLEMENTATION PROCESS FOR DIVERSION SCREENS, DAMS, AND FISH PASSAGE STRUCTURES



*While costs of noncompliance are not part of the analysis required for the RFA, they are mentioned here to provide a complete picture of the compliance and rule enforcement process given that a focus of the proposed rule is to clarify WDFW's existing authority to address noncompliance through enforcement.

1.4.2 CULVERTS AND CROSSINGS

The proposed rule affects water crossings similarly to dams, diversions, and fish passage improvement structures in terms of fish passage requirements (i.e., those already codified in the Hydraulic Code and WDFW assessment guidance). Therefore, the two circumstances identified in the previous section apply to water crossings as well. However, the climate adapted standard introduces additional factors that complicate the conceptual model (Exhibit 1-3), leading to one additional circumstance where the proposed rule is most likely to generate costs to owners.

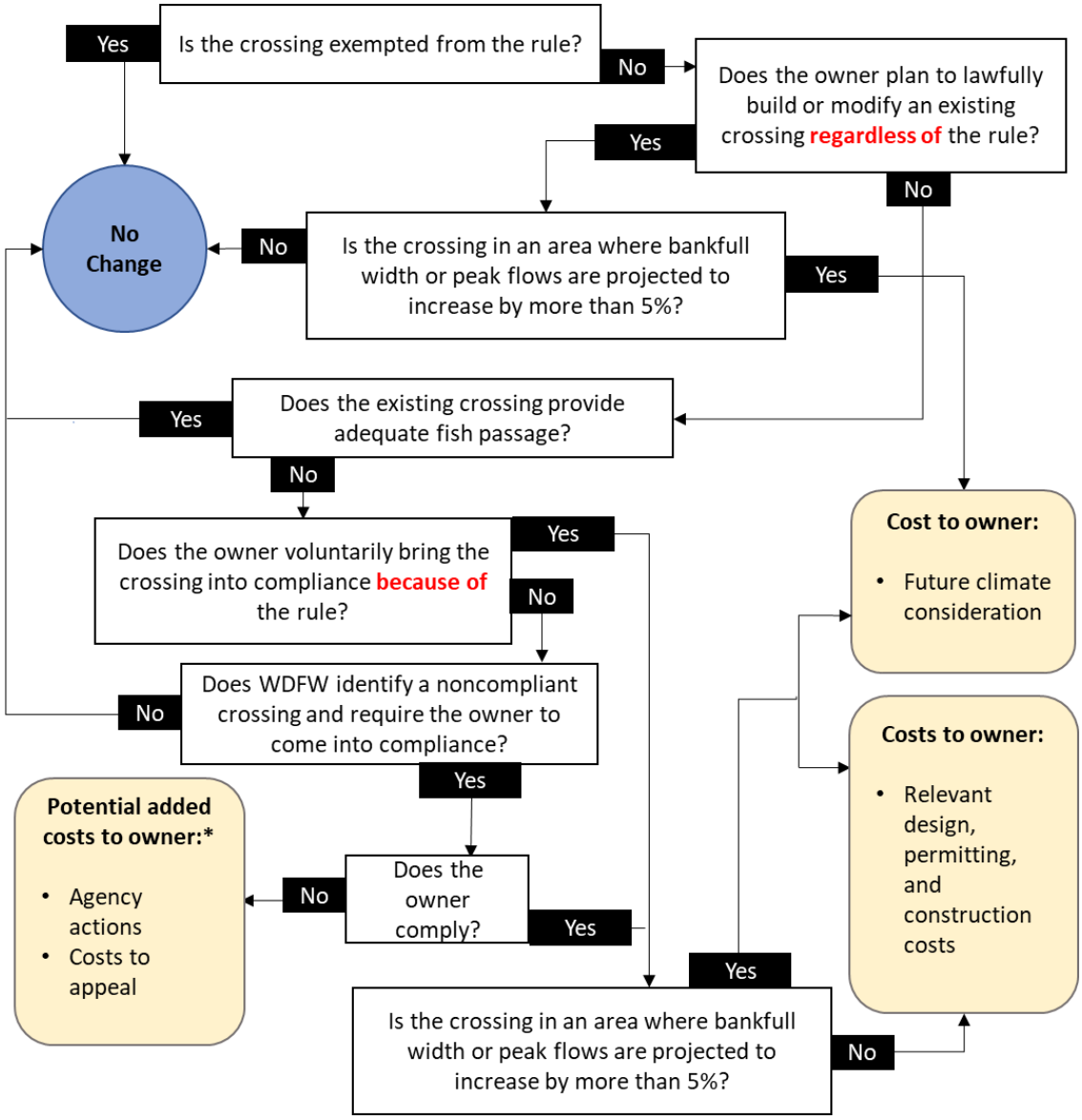
Two details from the proposed rule are relevant. First, water crossings installed prior to adoption of the proposed rule are not subject to the climate adapted requirement as long as they are compliant in terms of fish passage and are within their designed lifespan. Second, only culverts and crossings located in areas where bankfull width or 100-year peak flows are expected to increase by at least five percent are required to consider incorporating climate projections into the design process.

For water crossings, the rule is most likely to generate costs to owners in the following circumstance (in addition to those identified in the prior section):

- *An owner would plan to replace (or build) a culvert or crossing regardless of the rule but would not consider future climate change in the design of the structure but for the rule.* While compliance with the fish passage standards would be achieved through the existing HPA program in this case, the incremental cost of designing for future climate would be attributable to the rule in cases where the owner was not planning to do so already. In practice, many owners decide (or are advised) to consider future conditions even absent the proposed rule, so this is expected to be a small category of structures.

This conceptual model reveals that only a portion of the noncompliant water crossings on the landscape will generate costs as a result of the proposed rule. This is because some structures are exempt, some are already compliant, and some noncompliant structures would have been replaced to the standards included in the proposed rule even in its absence, or will not be prioritized by WDFW for correction. Second, the costs associated with the proposed rule for this category of structures includes all aspects of bringing a noncompliant structure into compliance (e.g., permitting, design, construction). As described in Section 2.2, the nature and magnitude of these costs is site specific, depending on the structure type and nature of the violation, among other things.

EXHIBIT 1-3. CONCEPTUAL MODEL OF RULE IMPLEMENTATION PROCESS FOR WATER CROSSING STRUCTURES



*While costs of noncompliance are not part of the analysis required for the RFA, they are mentioned here to provide a complete picture of the compliance and rule enforcement process given that a focus of the proposed rule is to clarify WDFW's existing authority to address noncompliance through enforcement.

CHAPTER 2 | SMALL BUSINESS IMPACTS

This chapter evaluates the potential economic impacts of the proposed rule on small businesses in Washington State. As outlined in the RFA and in accordance with other guidance and best practices, this SBEIS addresses the following questions.[16,17,18]

- What are the industries and universe of businesses that may incur costs as a result of this rule?
- What are the likely costs of the rule to those businesses?
- Are the costs resulting from the rule anticipated to be more than minor?
- Will the rule disproportionately affect small businesses?
- What steps has the agency taken to reduce the costs of the rule on small businesses?
- How has the agency involved small businesses in the development of the rule?
- How many jobs may be created or lost as a result of compliance with the rule?

The sections that follow address each of these questions.

2.1 POTENTIALLY AFFECTED SMALL BUSINESSES

As the proposed rule is directed toward regulating structures on the landscape, it does not target a particular sector or industry. However, the rule could potentially affect individual businesses that own a noncompliant structure, or a property on which a noncompliant structure is located, subject to the following three circumstances identified in Section 1.4: (1) new information from the rule prompts the owner to comply, (2) WDFW identifies

[16] RCW 19.85.040 Small business economic impact statement—Purpose—Contents. Accessed October 13, 2022 at: https://app.leg.wa.gov/RCW/default.aspx?cite=19.85.040.

[17] ORIA. 2021. Regulatory Fairness Act Support. Accessed October 13, 2022 at: https://www.oria.wa.gov/site/alias__oria/934/regulatory-fairness-act-support.aspx.

[18] WA Attorney General Office. 2021. Small Business Economic Impact Statements – Frequently Asked Questions. Accessed October 13, 2022 at: https://www.oria.wa.gov/Portals/_oria/VersionedDocuments/RFA/Regulatory_Fairness_Act/DRAFT_SBEIS_FAQ.pdf.

the noncompliant structure and requests a correction, or (3) the owner was modifying (or building) a water crossing and not considering future climate conditions in the design.

Key findings

- ✓ An unknown but limited subset of privately owned structures are owned by businesses and expected to be affected by the proposed rule
- ✓ Businesses that own structures can potentially belong to any industry
- ✓ The minor cost threshold and the likelihood that an affected business is small varies by industry

The best available information regarding the universe of structures potentially subject to the rule is contained in WDFW's geodatabase of known fish passage barriers (henceforth, the "Inventory").[19] However, there are several issues with using the Inventory to identify particular small businesses that would be impacted. First, the compliance status of barriers in the Inventory is unknown. Second, it is impractical to identify the specific businesses or relevant economic sectors that own structures. The Inventory identifies which structures are privately owned, and in some cases the name of the owner, but it does not indicate whether the owner is a business or provide any information about the industry. Finally, the Inventory is updated on an ongoing basis as barrier inventorying efforts progress. Therefore, the full extent of relevant structures on the landscape is unknown.

Given the nature of the proposed rule and the data limitations that exist, we take a conservative approach to identifying potentially affected businesses. We acknowledge that aside from the exemptions noted below, any business that owns property in Washington with a diversion, obstruction, or crossing on a fish bearing stream could incur costs as a result of the proposed rule, and such businesses could theoretically belong to any industry. At the same time, businesses within a few industries may be more likely to own certain types of structures based on the nature of their operations and/or the size of their landholdings.

2.1.1 NONEXEMPT STRUCTURES IN THE INVENTORY

The Inventory identifies five types of structures potentially subject to the rule as follows:[20]

- Dams;
- Diversions;
- Fish passage improvement structures;

[19] WDFW Open Data. Fish Passage Barriers Inventory. Accessed September 2022 at: https://data-wdfw.opendata.arcgis.com/documents/wdfw::fish-passage-barriers-inventory-zipped-file-geodatabase/about

[20] Within the Inventory, fish passage improvement structures are categorized as "fishways." However, the definition of fishways in the proposed rule includes fish passage improvement structures, culverts, and non-culvert crossings (see Section 1.3.1). To minimize confusion, we generally adopt the language used in the Inventory for this section, except that we use "fish passage improvement structures" in place of "fishways."

- Culverts;
- Non-culvert crossings (e.g., bridges, conduits, fords).

There are a total of 50,367 structures in these categories within the Inventory (Exhibit 2-1). However, the rule incorporates specific exemptions that reduce the number of structures subject to the rule, either because they fall outside of WDFW authority, or because they are grandfathered in. The following categories of structures are exempt from all provisions of the proposed rule:

- Those on non-fish bearing lakes, streams, or rivers;
- Those on federal or tribal owned land;
- Obstructions that are federally owned or subject to federal laws that preempt RCW 77.57;
- Agricultural drainage system components installed on or before May 20, 2003;[21] and
- Lawful diversions installed on or before June 11, 1947 in waters containing game fish only.[22]

Of the relevant structures in the Inventory, one or more exemption applies to 15,653 (31 percent) structures. Of the 34,714 remaining structures, 15,682 (45 percent) are privately owned. Exhibit 2-2 demonstrates the spatial distribution of known nonexempt and privately owned structures throughout the state. Of these, a substantial portion (67 percent) are culverts, 17.5 percent are other types of crossings, 8 percent are dams, 6 percent are diversions, and about 1 percent are fish passage improvement structures.[23]

The Inventory provides useful information, but it should not be considered a complete assessment of the situation that exists on the landscape. It provides sufficient data to perform coarse analysis based on structure location and owner type, but it is known to be incomplete. Washington State Department of Ecology, for example, has identified 49,430 points of water surface diversion, compared to the 1,550 diversions contained in the Inventory.[24] It is unknown, however, what portion of the points identified by Ecology represent active points of diversion that require screening, what portion would be exempt from the proposed rule, and what portion are privately owned. Therefore, we maintain that the Inventory represents the best available information for performing SBEIS analysis but note that it likely underestimates the scale of the problem for diversions in particular.

[21] These structures are identified as "Other" in the Inventory, which we excluded from this analysis due to the varied types of structures contained within that category.

[22] Date of installation is not provided in the Inventory. However, outreach to stakeholders indicated that the majority of agricultural diversions were installed prior to this date.

[23] The structure categories are not mutually exclusive. For example, a dam may be associated with a diversion, a fish passage structure, or both.

[24] Email communication with WDFW staff on December 19, 2020.

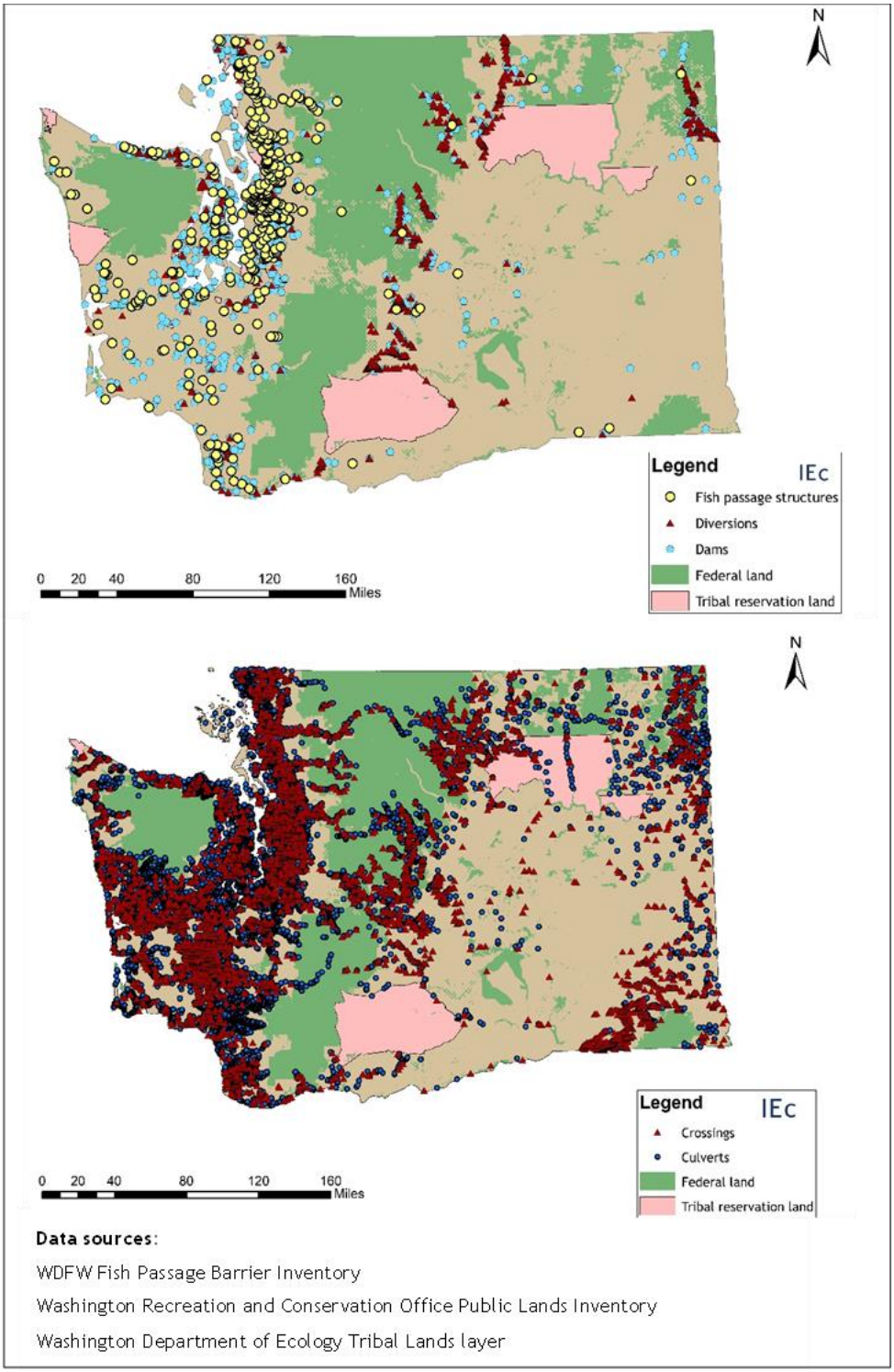
EXHIBIT 2-1. NUMBER OF EXEMPT, NONEXEMPT, AND NONEXEMPT PRIVATELY OWNED STRUCTURES IN THE WDFW INVENTORY

	DAMS	DIVERSIONS[1]	FISH PASSAGE STRUCTURES	CULVERTS	CROSSINGS	TOTAL
Total	2,046	1,550	944	38,818	7,009	50,367
Exempt	429	450	274	12,718	1,782	15,653
Nonexempt	1,617	1,100	670	26,100	5,227	34,714
Nonexempt, Privately Owned	1,258	939	187	10,548	2,750	15,682

Note: The true number of nonexempt, privately owned structures on the landscape is unknown and may be much higher. However, only a portion would be impacted by the proposed rule.
1. As noted in the text, Washington State Department of Ecology estimates the total number of diversions may be several orders of magnitude higher. However, data is insufficient to confirm applicability of screening requirements, and to identify exemptions or ownership type.

Regardless of the true number of privately owned, nonexempt structures on the landscape, only a portion are expected to be both impacted by the rule and owned by a business (i.e., those that are the focus of this SBEIS). Considering the estimates in the Inventory, a subset of the approximately 16,000 relevant structures are owned by residential property owners that are not businesses. Additionally, a subset of the structures that are owned by businesses likely already comply with the design standards incorporated into the proposed rule or would comply with existing regulations in the future and would therefore not experience additional costs resulting from the proposed rule. However, both the universe of structures and the portion that would experience added costs due to the proposed rule are uncertain.

EXHIBIT 2-2. SPATIAL DISTRIBUTION OF NONEXEMPT PRIVATELY OWNED STRUCTURES IN THE INVENTORY



2.1.2 IDENTIFICATION OF POTENTIALLY AFFECTED BUSINESSES

As noted, businesses that may be impacted by the proposed rule can potentially belong to any industry that exists in Washington. For example, some individual businesses owning relevant structures that were mentioned during interviews include a shopping mall, a football field, an Amazon facility, hunting clubs, gas stations, and general contractors. Accordingly, this SBEIS provides contextual industry-scale information about the businesses that could potentially be affected by the proposed rule (Exhibit 2-3). This information should not be interpreted as identifying the universe of businesses that may or are likely to be affected by the rule. In fact, most businesses in these industries are unlikely to be affected by the rulemaking. However, given the uncertainty regarding the specific universe of entities that will experience costs of the rule, this analysis errs on the side of transparency to ensure due consideration of the full scope of potentially affected small businesses.

Exhibit 2-3 includes information relevant to the SBEIS analysis. First, it identifies the total number of businesses in Washington belonging to each industry, and the proportion considered "small." In addition, it provides the industry-wide average annual payroll and revenues, which are used to calculate the minor cost threshold. For an SBEIS, the threshold is used to determine whether the compliance costs of a proposed rule are considered "more than minor." As defined in RCW 19.85.020, the minor cost threshold is the greatest of $100, one percent of annual payroll, or three-tenths of one percent of annual revenues.[25]

Depending on the industry, the likelihood that any business impacted by the proposed rule would be considered small varies. Within some industries, such as gasoline stations (NAICS Code 447), a very large proportion (99 percent) are considered small. In other industries, such as general merchandise stores (NAICS Code 452), a much lower proportion are considered small (55 percent).

There is also wide variation across industries in the minor cost threshold. It ranges from as low as $423 for private households employing workers such as cooks or house cleaners (NAICS Code 814), up to nearly $1 million ($915,976) for hospitals (NAICS Code 622).

EXHIBIT 2-3. NUMBER OF BUSINESSES, AVERAGE ANNUAL REVENUES, AND MINOR COST THRESHOLD FOR WASHINGTON STATE INDUSTRIES

INDUSTRY (NAICS CODE)[1]	INDUSTRY DESCRIPTION	TOTAL NUMBER OF BUSINESSES[2]	PROPORTION CONSIDERED SMALL[3]	AVERAGE ANNUAL PAYROLL	AVERAGE ANNUAL REVENUE	MINOR COST THRESHOLD (USD)[4]
111	Crop Production	4,694	0.96	439,622	1,169,522	4,444
112	Animal Production and Aquaculture	779	0.97	358,501	703,769	3,681
113	Forestry and Logging	429	0.97	509,462	1,775,799	5,327

[25] RCW 19.85.020 Definitions. Accessed November 3, 2022 at: https://app.leg.wa.gov/rcw/default.aspx?cite=19.85.020

INDUSTRY (NAICS CODE)[1]	INDUSTRY DESCRIPTION	TOTAL NUMBER OF BUSINESSES[2]	PROPORTION CONSIDERED SMALL[3]	AVERAGE ANNUAL PAYROLL	AVERAGE ANNUAL REVENUE	MINOR COST THRESHOLD (USD)[4]
114	Fishing; Hunting and Trapping	209	0.97	546,119	828,952	5,461
115	Support Activities for Agriculture and Forestry	787	0.89	1,227,640	723,635	12,500
211	Oil and Gas Extraction	UNKNOWN	UNKNOWN	UNKNOWN	1,996,053	5,988
212	Mining (except Oil and Gas)	116	0.88	1,140,014	3,445,405	12,825
213	Support Activities for Mining	28	UNKNOWN	UNKNOWN	3,756,579	11,270
221	Utilities	595	0.90	3,620,713	20,219,438	60,658
236	Construction of Buildings	9,405	0.98	399,571	1,380,768	4,142
237	Heavy and Civil Engineering Construction	1,186	0.91	1,574,035	6,727,295	20,182
238	Specialty Trade Contractors	16,306	0.97	508,232	1,068,808	5,084
311	Food Manufacturing	1,036	0.83	1,941,809	11,625,030	34,875
312	Beverage and Tobacco Product Manufacturing	829	0.96	532,644	2,060,783	6,182
313	Textile Mills	24	UNKNOWN	871,836	3,090,002	9,270
314	Textile Product Mills	137	0.96	657,358	963,465	6,574
315	Apparel Manufacturing	88	0.94	767,197	364,822	7,672
316	Leather and Allied Product Manufacturing	30	UNKNOWN	347,578	1,541,679	4,625
321	Wood Product Manufacturing	374	0.82	1,966,381	13,778,702	41,336
322	Paper Manufacturing	101	0.58	6,277,660	51,656,357	154,969
323	Printing and Related Support Activities	504	0.96	516,478	738,110	5,165
324	Petroleum and Coal Products Manufacturing	34	UNKNOWN	11,478,774	211,324,337	633,973
325	Chemical Manufacturing	351	0.91	1,717,059	9,061,750	27,185
326	Plastics and Rubber Products Manufacturing	208	UNKNOWN	2,084,421	10,251,484	30,754
327	Nonmetallic Mineral Product Manufacturing	306	0.83	1,864,570	6,271,891	24,146
331	Primary Metal Manufacturing	91	0.78	3,902,358	16,157,609	48,473
332	Fabricated Metal Product Manufacturing	1,076	0.91	1,025,313	4,218,991	12,657
333	Machinery Manufacturing	496	0.88	2,008,224	6,464,372	20,370
334	Computer and Electronic Product Manufacturing	405	0.82	4,590,449	15,368,835	47,837
335	Electrical Equipment; Appliance; and Component Manufacturing	155	0.92	2,746,337	10,772,296	32,317

INDUSTRY (NAICS CODE)[1]	INDUSTRY DESCRIPTION	TOTAL NUMBER OF BUSINESSES[2]	PROPORTION CONSIDERED SMALL[3]	AVERAGE ANNUAL PAYROLL	AVERAGE ANNUAL REVENUE	MINOR COST THRESHOLD (USD)[4]
336	Transportation Equipment Manufacturing	499	0.73	21,977,392	58,252,915	219,774
337	Furniture and Related Product Manufacturing	363	0.93	786,514	1,928,426	7,865
339	Miscellaneous Manufacturing	780	0.95	984,194	2,058,454	9,870
423	Merchant Wholesalers; Durable Goods	6,146	0.96	972,460	7,630,534	22,892
424	Merchant Wholesalers; Nondurable Goods	3,597	0.95	886,061	9,929,810	29,789
425	Wholesale Electronic Markets and Agents and Brokers	3,783	0.99	552,115	2,096,183	6,289
441	Motor Vehicle and Parts Dealers	2,329	0.90	1,019,470	7,767,559	23,303
442	Furniture and Home Furnishings Stores	840	0.97	466,570	1,759,330	5,278
443	Electronics and Appliance Stores	946	0.95	647,593	3,521,033	10,563
444	Building Material and Garden Equipment and Supplies Dealers	1,531	0.92	862,894	4,222,240	13,188
445	Food and Beverage Stores	2,883	0.85	865,435	4,530,545	13,592
446	Health and Personal Care Stores	1,688	0.99	431,227	3,243,206	9,730
447	Gasoline Stations	1,758	0.99	216,641	5,562,917	16,689
448	Clothing and Clothing Accessories Stores	2,005	0.97	245,754	818,862	4,272
451	Sporting Goods; Hobby; Musical Instrument; and Book Stores	1,268	0.97	307,000	1,269,975	4,155
452	General Merchandise Stores	692	0.55	3,662,019	19,750,293	183,683
453	Miscellaneous Store Retailers	2,995	0.98	250,449	1,156,840	3,471
454	Nonstore Retailers	897	0.96	16,205,591	1,945,471	162,056
481	Air Transportation	132	0.89	10,138,945	1,664,360	118,540
482	Rail Transportation	UNKNOWN	UNKNOWN	UNKNOWN	11,040,076	33,120
483	Water Transportation	70	0.76	4,468,656	3,675,900	44,687
484	Truck Transportation	2,471	0.96	529,431	961,799	5,539
485	Transit and Ground Passenger Transportation	321	0.79	3,942,817	425,244	39,428
486	Pipeline Transportation	UNKNOWN	UNKNOWN	3,863,173	8,485,313	57,948
487	Scenic and Sightseeing Transportation	93	UNKNOWN	179,981	298,070	1,800

INDUSTRY (NAICS CODE)[1]	INDUSTRY DESCRIPTION	TOTAL NUMBER OF BUSINESSES[2]	PROPORTION CONSIDERED SMALL[3]	AVERAGE ANNUAL PAYROLL	AVERAGE ANNUAL REVENUE	MINOR COST THRESHOLD (USD)[4]
488	Support Activities for Transportation	1,308	0.92	1,490,053	3,456,933	14,901
491	Postal Service	556	0.87	1,429,088	1,366,764	14,291
492	Couriers and Messengers	528	0.87	1,579,236	1,260,781	20,300
493	Warehousing and Storage	352	0.84	2,515,217	3,511,665	37,189
511	Publishing Industries (except Internet)	1,999	0.96	10,493,716	3,509,376	106,531
512	Motion Picture and Sound Recording Industries	477	0.95	341,202	584,475	3,835
515	Broadcasting (except Internet)	166	0.89	1,356,561	13,991,370	41,974
517	Telecommunications	876	0.93	3,231,416	14,391,650	72,451
518	Data Processing; Hosting; and Related Services	854	0.94	3,093,580	4,897,141	31,579
519	Other Information Services	1,080	0.95	7,584,633	3,455,841	91,127
521	Monetary Authorities-Central Bank	UNKNOWN	UNKNOWN	UNKNOWN	10,619,926	31,860
522	Credit Intermediation and Related Activities	3,671	0.97	1,299,289	12,547,552	39,961
523	Securities; Commodity Contracts; and Other Financial Investments and Related Activities	2,577	0.99	887,653	3,699,369	13,872
524	Insurance Carriers and Related Activities	3,625	0.97	1,010,890	2,439,165	11,871
525	Funds; Trusts; and Other Financial Vehicles	79	UNKNOWN	UNKNOWN	1,743,641	5,231
531	Real Estate	7,792	0.98	383,778	944,906	4,418
532	Rental and Leasing Services	1,019	0.97	483,241	2,609,092	8,218
533	Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	50	UNKNOWN	451,905	2,757,528	8,273
541	Professional; Scientific; and Technical Services	28,284	0.98	823,090	1,287,629	8,393
551	Management of Companies and Enterprises	734	0.82	7,463,110	1,207,340	86,101
561	Administrative and Support Services	12,441	0.96	623,642	1,470,903	6,499
562	Waste Management and Remediation Services	705	0.91	1,957,675	5,663,318	22,296
611	Educational Services	4,164	0.87	3,777,796	363,526	37,778
621	Ambulatory Health Care Services	11,584	0.95	936,062	1,204,416	10,852
622	Hospitals	205	0.41	53,901,534	158,541,672	915,976

INDUSTRY (NAICS CODE)[1]	INDUSTRY DESCRIPTION	TOTAL NUMBER OF BUSINESSES[2]	PROPORTION CONSIDERED SMALL[3]	AVERAGE ANNUAL PAYROLL	AVERAGE ANNUAL REVENUE	MINOR COST THRESHOLD (USD)[4]
623	Nursing and Residential Care Facilities	2,670	0.85	933,842	3,361,833	10,085
624	Social Assistance	46,342	0.99	85,169	495,281	1,486
711	Performing Arts; Spectator Sports; and Related Industries	773	0.95	778,973	154,766	7,814
712	Museums; Historical Sites; and Similar Institutions	269	0.91	799,191	437,989	7,992
713	Amusement; Gambling; and Recreation Industries	2,284	0.91	582,224	390,715	5,822
721	Accommodation	1,684	0.92	463,273	469,106	4,904
722	Food Services and Drinking Places	16,093	0.96	296,082	854,026	3,514
811	Repair and Maintenance	4,627	0.99	283,254	494,163	2,985
812	Personal and Laundry Services	5,301	0.99	167,239	171,042	1,848
813	Religious; Grantmaking; Civic; Professional; and Similar Organizations	3,793	0.97	451,782	580,613	4,675
814	Private Households	6,363	UNKNOWN	42,277	116,576	423

Notes:
1. Type of business as identified by 3-digit North American Industry Classification System (NAICS) code.
2. Some entities represented in these broad industry categories may be public or quasi-public.
3. In some cases, this value may underestimate the percentage of businesses considered small. For the SBEIS, RCW 19.85 defines small businesses as those with 50 or fewer employees. Washington State Employment Security Department's Labor Market and Economic Data reports statewide counts of businesses with 49 or fewer employees.
4. In accordance with RCW 19.85.030(1)(a) minor cost threshold is the greater of 1% of annual payroll, 0.3% of annual revenue, or $100.

Sources: Washington State Employment Security Department 2020 Labor Market and Economic Data (Number of Businesses and Proportion Considered Small); United States Bureau of Labor Statistics 2020 Total Wages and Number of Establishments (Average Annual Payroll); Washington State Department of Revenue 2020 Gross Business Income and Number of Establishments (Average Annual Revenue)

Although businesses potentially impacted by the proposed rule can theoretically belong to any industry, some industries may be more likely to be affected than others. Outreach efforts consistently identified three main industries they felt were the most likely to be impacted: agriculture, forestry, and homeowner associations (HOAs). Agricultural businesses rely on stream diversions for irrigation, forestry businesses for their haul road crossings, and HOAs for irrigation diversions (e.g., for lawn watering) and for culverts and crossings along privately owned roadways.

In addition to the association between these industries and particular structures they use in normal business operations, agriculture and forestry businesses may be more likely than businesses in other industries to own structures on the landscape simply due to their large landholdings. Washington has a total land area of 45.7 million acres, of which

roughly 19.8 million are publicly owned and about 6 million are owned by tribes.[26,27] Of the remaining 19.9 acres of generally privately owned land, about 4 million (20 percent) are privately owned forestland and about 8.37 million (42 percent) are devoted to agriculture.[28,29]

2.2 COST OF COMPLIANCE

Consistent with RCW 19.85.040(1), this analysis evaluates the relevance of the following potential categories of costs to comply with the proposed rule:

Key findings

- ✓ Compliance costs will vary widely depending on the structure and nature of the violation
- ✓ Most projects (especially larger scale) receive some grant funding, defraying the cost borne by owners

- Reporting, recordkeeping, and other compliance requirements.
- Professional services that a small business is likely to need in order to comply with such requirements.
- Costs required to comply with the proposed rule, including costs of equipment, supplies, labor, professional services, and increased administrative costs.
- Based on input received, determine whether compliance with the rule will cause businesses to lose sales or revenue.

The range of costs for complying with the proposed rule will generally vary according to the structure type and the nature of the violation. For example, the violation could be caused by a buildup of debris, which could potentially be corrected with a few hours of labor (or less). At the higher end, situations could exist where a culvert requires replacement with a bridge due to inadequate fish passage and large expected changes from climate change. Here we provide cost estimates for replacing (or in the case of dams, removing) five types of structures, though we acknowledge that full replacement (or removal) may not be necessary in every case. At the same time, many projects of this type receive at least partial funding through some grant or cost sharing program. We highlight some of these programs in a subsequent section but note here that the cost estimates do not necessarily reflect the costs ultimately borne by an owner.

We collected project cost estimates from seven firms for five types of projects: (1) installing diversion screens, (2) removing dams, (3) installing fish passage improvement

[26] Washington State Recreation and Conservation Office. 2014. "Washington Public Lands Inventory Final Report".

[27] State of Washington Department of Ecology. "Working with tribal governments." Accessed November 3, 2022 at: https://ecology.wa.gov/About-us/Accountability-transparency/Government-coordination/Tribal-relations

[28] Washington State Department of Commerce. "Stewardship and sustainability in a growing industry." Accessed November 1, 2022 at: http://choosewashingtonstate.com/why-washington/our-key-sectors/forest-products

[29] Washington State Department of Agriculture. Agriculture Land Use geodatabase. Accessed October 6, 2022 at: https://agr.wa.gov/departments/land-and-water/natural-resources/agricultural-land-use

structures, (4) installing culverts, and (5) installing bridges. For diversion screening, we learned that it is appropriate to consider two subcategories (small and large). Requested costs for each project type fell in three broad categories, or project phases: (1) permitting, (2) engineering and design, and (3) construction. Not all firms were able to provide estimates for each project and/or phase, and some firms combined permitting with design and engineering. For consistency, therefore, the summarized estimates presented in Exhibit 2-4 combine permitting with design and engineering into a single cost category. Full (anonymized) results from each firm are provided in Attachment C.

EXHIBIT 2-4. COST RANGES FOR REPLACING RELEVANT STRUCTURES

COST CATEGORY	DIVERSION SCREENING (SMALL)	DIVERSION SCREENING (LARGE)	DAM REMOVAL	FISH PASSAGE STRUCTURE	CULVERT	BRIDGE
Permitting, design, and engineering	N/A	$2,000 - $4M	$15,000 - $4M	$30,000 - $400,000	$5,000 - $400,000	$15,000 - $1M
Construction	$100 - $10,000	$50,000 - $400,000	$50,000 - $1.5M	$200,000 - $1.5M	$40,000 - $800,000	$50,000 - $5M
Total	$100 - $10,000	$52,000 - $4.4M	$65,000 - $5.5M	$230,000 - $1.9M	$45,000 - $1.2M	$65,000 - $6M

Source: Data collected from engineering and consulting firms performing the services (see Attachment C).

The ranges in project cost estimates reported in Exhibit 2-4 reflect two types of variation: variation between firms and variation due to project-specific characteristics. Firm-level variation is provided in Attachment C. Some comparisons between firms are possible in cases where multiple firms provide estimates for a project-phase combination. These are generally in agreement, with a few notable exceptions. One firm provided estimates for diversion screening that were several orders of magnitude larger than others, and another firm did the same for bridges. Differences of these type are most likely indicative of the firm's clientele (e.g., public utility diversions and state highway bridges versus privately-owned structures).

Aside from firm-level variation, significant variation exists due to project-specific characteristics (summarized in Exhibit 2-5). Some factors apply to projects across many of the categories. These include things like the number of jurisdictions involved, which can complicate permitting, difficulties moving heavy equipment around more urban environments, and increased transportation costs to more remote locations.

EXHIBIT 2-5. PROJECT-SPECIFIC CHARACTERISTICS DRIVING VARIATION IN TOTAL COST

CATEGORY	DESCRIPTION
Structure characteristics	Structure type, dimensions, roadway design speed, vertical profile, intake speed
Geotechnical factors	Slope, soil type
Site characteristics	Presence of utility, ownership of adjacent land
Permitting requirements	Involvement of multiple jurisdictions, environmental concerns
Location characteristics	Population density (urban/rural), traffic management during construction
Hydrologic characteristics	Stream flow/velocity
Notes: The influence of these factors on cost are often interactive (e.g., larger structures can trigger additional permitting or require easements).	

Other cost drivers are more specific to particular project types. For diversions, the largest driver of variation is the flow rate at the point of diversion or intake. Smaller pump screens, for example, require a self-cleaning apparatus at flows beyond 3 cubic feet per second, which can increase the cost by several thousand dollars or more. Larger gravity diversion screens need custom fabrication and construction and require more permitting and complicated installation processes, driving the cost into the tens of thousands or even millions for a small number of very large projects.

Dam removal costs are highly dependent on project scale (i.e., dimensions) and the extent of sediment buildup in the reservoir. If the sediment is determined to contain contaminants, sediment disposal can represent a substantial portion of overall costs.

Costs for culverts and bridges are also highly dependent on scale. Other key factors include the vertical profile of the surrounding road, the designed speed of the roadway, and the need to manage traffic during construction.

Lacking detailed information about the project-specific characteristics (and ownership) of each structure in the Inventory, it is impossible to determine the compliance costs for any particular business or even the distribution of compliance costs. However, published data containing costs of completed projects provides some information to characterize the likely distribution, and to ground the cost estimates more generally.

The National Oceanic and Atmospheric Association (NOAA) collects data for projects that received grant funds from the Pacific Coastal Salmon Recovery Fund, including fish screens and culverts.[30] The database identifies 69 completed "fish screen" projects. Median cost for these projects is $72,236 and median is $202,489. The database does not identify culvert replacement as a unique project type. However, a recent study utilized the

[30] Pacific Northwest salmon habitat project database, 2022. National Marine Fisheries Service, Northwest Fisheries Science Center. Accessed November 11, 2022 at: https://www.webapps.nwfsc.noaa.gov/pnshp/.

database to analyze culvert project costs within Washington and Oregon.[31] Among the 1,236 culvert projects analyzed, mean cost was $82,600.

A few studies report dam removal costs. One found a median cost of $150,000 and mean cost of $1.8 million based on a national survey of project managers for 317 completed dam removal projects.[32] Another analyzed a subset of projects contained in American Rivers' database of dam removals in the United States for which cost information was available, reporting a median of $116,283 and a mean of $440,448.[33]

The completed projects reported above do not perfectly match the projects relevant to this rule. However, they provide useful contextual information. First, all of the reported summary statistics fall within the range for each project type obtained from firms as part of this analysis (Exhibit 2-4), supporting the validity of our estimates. Second, they suggest that the likely compliance cost for most affected businesses in Washington will be at the lower end of the range. The mean and median empirical cost estimates for completed screen, dam removal, and culvert replacement projects cited above are all well below the midpoints of the respective ranges in Exhibit 2-4. In addition, where both means and medians are reported, mean project costs exceed medians. These facts both suggest that values at the high end of the range are less common than those at the lower end (i.e., the distribution is skewed left, and higher-cost projects are outliers).

As a final note about costs, in particular situations the only compliance cost will be the incremental cost of the climate adapted crossing requirement versus the full cost of replacing a crossing to comply with fish passage and the climate requirement. Therefore, it would be beneficial to understand how these individual components contribute to overall costs. Regarding this question, firms included in outreach efforts generally indicated two things: (1) any cost differential associated with constructing bridges and culverts on fish bearing versus non-fish bearing streams is negligible, and (2) their existing culvert and crossing design processes tend to already incorporate climate adaptation to some degree. As described in Section 1.3.2, some firms are aware of and already using WDFW's Culverts and Climate Change web application, while others use either a rule of thumb for upsizing or the Washington State Department of Transportation (WSDOT) standard of increasing current bankfull width by 20 percent and adding two feet.

The Culverts and Climate Change application predicts increases to bankfull width or peak flow will exceed five percent for roughly two-thirds of the state by area, which applies to about 97 percent of known culvert and crossing sites.[34] Some areas have projected increases as high as 42.6 percent for bankfull width and 203.5 percent for peak flow.

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[31] Van Deynze, B., et al. 2022. "What influences spatial variability in restoration costs? Econometric cost models for inference and prediction in restoration planning." Biological Conservation.

[32] Bernhardt E.S., et al. 2007. "Restoring Rivers One Reach at a Time: Results from a Survey of U.S. River Restoration Practitioners." Restoration Ecology.

[33] Blachly, B. and E. Uchida. 2017. "Estimating the marginal cost of dam removal." Environmental and Natural Resource Economics Working Papers. University of Rhode Island.

[34] The spatial correlation between structures and climate impacts arises because both are less likely in high elevation areas of the state.

Existing rules of thumb or the WSDOT standard may align with the Culvert and Climate Change application when projected changes are modest, but current practices are unlikely to be sufficient in extreme cases. Unfortunately, there is no way to quantify a threshold when existing practices become insufficient. In addition, there is a large degree of site-specificity affecting the incremental cost of upsizing a structure. For example, even minimal upsizing may trigger the need to purchase additional land, raise the vertical profile of the surrounding road, or relocate utilities, all of which can add significant costs. On the other hand, the incremental cost of upsizing may be restricted to the cost of any additional materials required, since permitting, design, and engineering often represent fixed costs. To summarize, the incremental cost of the climate adaptation requirement ranges from zero in cases where sufficient upsizing would occur absent the rule, to a substantial portion of the overall budget in complex cases where things like raising the roadbed, relocating utilities, or shifting from a culvert to bridge design may be necessary.

EXHIBIT 2-6. SUMMARY STATISTICS DESCRIBING THE MAGNITUDE OF CLIMATE-INDUCED PROJECTED CHANGES CONTAINED IN WDFW'S CULVERTS AND CLIMATE CHANGE WEB APPLICATION

	PORTION OF STATE WITH PROJECTED INCREASE 5% OR HIGHER	MEAN PROJECTED INCREASE (PERCENTAGE)	MEDIAN PROJECTED INCREASE (PERCENTAGE)	MAXIMUM PROJECTED INCREASE (PERCENTAGE)
Bankfull width	0.64	11.6	9.3	42.6
100-year peak flow	0.66	32.5	25.3	203.5

2.3 ASSESSMENT OF MINOR COST

As summarized in Exhibit 2-4, the likely cost of complying with the rule ranges from one hundred dollars for a small pump diversion screen to $6 million or higher for a complex bridge construction. Uncertainty in the compliance cost arising from project and site specificity, coupled with uncertainty about the industry classification of any business incurring costs, suggests that the compliance costs will be minor in some situations and more than minor in others. For example, a relatively low compliance cost (e.g., $500) would be below the minor cost threshold for businesses within most, but not all, industries (see Exhibit 2-3 for the minor cost threshold for each industry). As compliance costs are expected to exceed the minor cost threshold in at least some situations, however, this analysis finds that the proposed rule could impose more than minor costs on businesses.

2.4 DISPROPORTIONATE ECONOMIC IMPACT ANALYSIS

When proposed rule changes impose more than minor costs to businesses, the RFA (RCW 19.85.040) requires an analysis that compares the cost of compliance for small business with the cost of compliance for the ten percent of businesses that are the largest businesses required to comply with the proposed rules to determine whether the costs are considered disproportionate. The RFA (RCW 19.85.040[1]) describes the following formula for determining disproportionate impacts:

$$\frac{C_S}{A_S} > \frac{C_L}{A_L}$$

Where:

- *C* indicates the cost of compliance,
- *A* indicates an adjustment factor (total number of employees, total sales, or total labor hours),
- *S* subscripts denote small businesses (those with 50 or fewer employees) required to comply with the proposed rule, and
- *L* subscripts denote large businesses (the top ten percent) required to comply with the rule.

If the analysis finds that the inequality condition is met, the proposed rule is considered to have a disproportionate impact on small businesses. As described in Section 2.1.2, data limitations prevent precise identification of sectors, industries, or particular businesses that may be affected. Therefore, there is no way to empirically perform the analysis. However, insight can be gained from simple reasoning.

As described in Section 2.3, *C* depends on the type and size of the structure as well as site-specific characteristics. These factors have no known or hypothesized relationship with business size within a particular industry or sector. Therefore, it is reasonable to assume that $C_S = C_L$ (i.e., there is no difference between the expected cost of compliance for small and large businesses). All three potential adjustment factors, on the other hand, are expected to directly correlate with business size within an industry (i.e., $A_S < A_L$). It follows that for any industry, compliance costs are likely to be disproportionately borne by small businesses. Accordingly, this SBEIS identifies and documents cost mitigation strategies.[35]

2.5 COST MITIGATION STRATEGIES

RCW 19.85.030 requires that, when a rule is expected to disproportionately impact small businesses, the agency consider several methods for reducing the impact of the rule on small businesses, where legal and feasible in meeting the stated objectives of the statutes

[35] In the absence of sufficient data to calculate disproportionate impacts, an agency whose rule imposes more than minor costs must mitigate the costs to small businesses, where legal and feasible, as defined in this chapter (RCW 19.85.030[4]).

upon which the rule is based. These methods may include decisions that were made in determining the provisions of the rule itself, or opportunities to reduce the costs of implementing the rule as written. This section outlines existing and proposed opportunities for offsetting compliance costs, as well as the steps WDFW has taken to limit the costs of the proposed rule to businesses.

The compliance costs presented in Section 2.2.3 represent estimates for the full cost of each relevant service. However, outreach to owners, owner representatives, and firms performing the services indicated that most relevant project types that have been completed to date received at least some grant funding. Exhibit 2-7 highlights these grant programs.

EXHIBIT 2-7. GRANT PROGRAMS AVAILABLE FOR OFFSETTING COSTS TO OWNERS FOR CERTAIN PROJECT TYPES

PROGRAM NAME	LEVEL AND ADMINISTERING AGENCY	PROGRAM INFORMATION
Fish Barrier Removal Board[1]	State; DFW and Recreation and Conservation Office	Grant program for fish passage projects that remove impediments to salmon and steelhead migration. Up to $40 mil in funding available for 2021-2022.
Family Forest Fish Passage[2]	State; DNR and Recreation and Conservation Office	Funding for private forestland owners to remove culverts/stream crossings that prevent trout, salmon, and other fish from traveling upstream. Structures must be on forestland and on a fish-bearing stream. Up to $5.9 mil in funding for 2022-2023. $5,000 cost-sharing for owners who have harvested in the previous 3 years.
Salmon Recovery Funding Board[3]	State; Recreation and Conservation Office	Funding for salmon habitat protection for existing, high-quality habitat or restoration for degraded habitat. Typical projects replace barriers to fish migration, replant stream banks, remove shoreline armoring, etc. Open to local/state agencies, tribes, private landowners, nonprofits. Applicants can request between $5,000 and $200,000.
Barrier Removal Grants[4]	Federal; NOAA	$65 mil in funding available in 2022 for projects that remove in-stream barriers to fish passage (under Bipartisan Infrastructure Law). Open to institutions of higher education, non-profits, commercial organizations, and state, local, and tribal governments. Award amounts range from $1 mil to $15 mil.
Fish Passage Program[5]	Federal; U.S. Fish and Wildlife Service	Working with private landowners and tribes to remove obsolete/dangerous dams and working with transportation agencies to improve road stream crossings. $200 mil in funding from the Bipartisan Infrastructure Law over the next five years. Six projects in WA have received funding for culvert replacement and fish passage barrier removal.
Watershed and Flood Prevention Operations Program[6]	Federal; USDA Natural Resource Conservation Service	Technical and financial assistance to states, local governments, and tribes (project sponsors) for watershed protection projects. Project sponsors can then leverage NRCS assistance to help landowners

PROGRAM NAME	LEVEL AND ADMINISTERING AGENCY	PROGRAM INFORMATION
		implement the projects. Types of projects include fish and wildlife enhancement.
Washington Coast Restoration and Resiliency Initiative[7]	State; Recreation and Conservation Office	Grants of up to $2 million for specific coastal communities to address restoration and resiliency projects. Eligible applicants include cities, counties, conservation districts, private or public corporations, tribes, nonprofits, and state and Federal agencies.
Estuary and Salmon Restoration Program[8]	State; WDFW	Funding and technical assistance for organizations restoring shoreline and nearshore habitats for salmon restoration. Small grants ranging from $30,000 to $150,000 are available for local engagement and restoration projects.
Conservation District Resources[9]	State; Conservation Commission	Various grant and cost-share programs through conservation districts, including reimbursement for cultural resources surveys and monitoring, which may be required for some fishways projects

1 https://wdfw.wa.gov/about/advisory/fbrb; https://ecology.wa.gov/Blog/Posts/September-2021/Up-To-40-million-available-for-streamflow-restora
2 https://www.dnr.wa.gov/fffpp; https://rco.wa.gov/grant/family-forest-fish-passage-program/
3 https://rco.wa.gov/grant/salmon-recovery/
4 https://www.fisheries.noaa.gov/grant/restoring-fish-passage-through-barrier-removal-grants
5 https://www.fws.gov/program/national-fish-passage;
https://www.arcgis.com/apps/dashboards/99040e452de9487f80d9f5748f717880
6 https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/wfpo/;
https://www.nrcs.usda.gov/wps/portal/nrcs/main/ma/programs/planning/wo/
7 https://rco.wa.gov/grant/washington-coast-restoration-and-resiliency-initiative/
8 https://wdfw.wa.gov/species-habitats/habitat-recovery/puget-sound/esrp - esrp-grants
9 https://www.scc.wa.gov/cd/grants-contracts-and-finance

Additionally, RCW 19.85.030(2) specifies particular options that the agency must consider in mitigating rule costs. Exhibit 2-8 identifies each type of cost mitigation opportunity and how WDFW has considered them during this rule making process.

EXHIBIT 2-8. WDFW ASSESSMENT OF COST MITIGATION OPPORTUNITIES OUTLINED IN RCW 19.85.030

RCW 19.85.030 (2) REQUIREMENTS	WDFW RESPONSE
a) Reducing, modifying, or eliminating substantive regulatory requirements	Two exemptions (agricultural drainage system components installed on or before May 20, 2003, and lawful diversions installed on or before June 11, 1947 in waters containing game fish) are likely to eliminate a large number of small businesses from rule requirements.
b) Simplifying, reducing, or eliminating recordkeeping and reporting requirements	The rule does not introduce any new recordkeeping or reporting requirements.
c) Reducing the frequency of inspections	WDFW will limit the criteria that trigger a technical assistance or compliance visit, focusing on high priority projects.
d) Delaying compliance timetables	
e) Reducing or modifying fine schedules for noncompliance	The rule does not authorize fines, and to the contrary, introduces a graduated system of technical assistance and voluntary compliance options that may be exercised before WDFW resorts to mandatory compliance measures. Following inspection, WDFW can opt to take no action.
f) Any other mitigation techniques, including those suggested by small businesses or small business advocates.	WDFW will direct owners toward existing cost mitigation resources (e.g., grant programs) and is considering a revolving loan program to assist owners achieve compliance.

Many remaining costs associated with the rule, including costs to small businesses, do not readily lend themselves to legal or feasible reductions that are consistent with the clear objectives of RCW 77.57. The statutes on which the rules are based require fish passage and appropriate screening of diversions, which will impose some unavoidable costs notwithstanding these mitigation efforts.

2.6 INVOLVEMENT OF SMALL BUSINESSES IN RULE-MAKING PROCESS

This section describes how WDFW has sought to engage affected parties, including small businesses, in the rule making process, and how small businesses were involved in the development of the SBEIS.

2.6.1 INVOLVEMENT IN THE PRESENT RULE MAKING

The proposed rule targets fish passage and screening activities throughout Washington state and does not directly regulate a specific industry or group of businesses. Additionally, the rule does not target specific landowners. Due to the rule's broad nature and numerous fish passage and water diversion structures throughout the state, identifying small business owners has been difficult, especially with available data. To ensure due consideration of potential effects on small businesses, WDFW took a broad

approach to outreach, communicating the objectives of the rule proposal and soliciting input through virtual presentations. News releases and social media notifications were also used to publicize rule making activities. This provided opportunities for potentially affected small businesses to be involved in the rule proposal process. The outreach activities and events to date are summarized in Exhibit 2-9.

EXHIBIT 2-9. WDFW OUTREACH ACTIVITIES FOR PROPOSED RULE

DATE	ACTIVITY
June 23 & July 1, 2020	Tribal Technical Workshop Presentation on existing WDFW fish passage and screening processes and to take comments about the direction of rule development
July 1, 2020	CR-101, preproposal statement of inquiry, published (filed on June 17, 2020)
July 20, 2020	News Release
July 29, 2020	General Public Technical Workshop Presentation on existing WDFW fish passage and screening processes and to take comments about the direction of rule development
February 10, 2021	Tribal Policy Webinar to review the initial draft rule proposal and take comments
February 16, 2021	News Release
February 26, 2021	General Public Policy Webinar to review the initial draft rule proposal and take comments
October 11, 2022	News Release
October 18, 2022	Tribal Second Policy Webinar to review the updated draft rule proposal and take comments
October 25, 2022	General Public Second Policy Webinar to review the updated draft rule proposal and take comments

In addition, WDFW has attempted to identify and directly contact affected industries for engagement. For example, employees at the Washington Forest Protection Association were emailed regarding the October 25, 2022 policy webinar and were encouraged to provide feedback regarding the draft rule language. More recently, WDFW has engaged with the Department of Agriculture to work with their affected stakeholders. WDFW has accepted public comments via email, phone, fax, and mail since the first News Release on July 20, 2020. In 2021, WDFW began to offer a dedicated Public Input website for additional comments and feedback. There has been minimal engagement from self-identified business owners.

2.6.2 INVOLVEMENT IN SBEIS DEVELOPMENT

As described previously, because this rule making does not regulate a specific industry or group of businesses, it was not possible to systematically identify and target outreach activities at businesses in general, and small businesses in particular, that may incur costs as a result of the rule. IEc did, however, conduct several interviews with state agencies and other groups who interact directly and regularly with the two industries most likely to own structures based on the scale of their landholdings (agriculture and forestry). These

included representatives from Conservation Districts, Washington State Department of Agriculture, Washington State Department of Natural Resources, and the Washington State Water Resources Association. A complete description of the outreach activities conducted to support this analysis is included in Attachment A.

2.7 JOBS CREATED OR LOST

Increased compliance will drive an increase in demand for all services related to replacing or modifying diversion screens and fishways (e.g., permitting, engineering, design, construction). For example, several interviewees mentioned firms manufacturing precast concrete structures (i.e., box culverts) as potential beneficiaries. To the extent that increased demand for these products and services results in firms hiring additional staff, that creation of jobs could be considered an indirect effect of the rule. However, whether this would occur, and the number of businesses or jobs affected, is uncertain. On a related note, several interviewees also indicated that there is currently a lack of professional capacity in the state to perform the relevant services.

The effect of the proposed rule on job losses is also uncertain. Compliance costs are highly variable, but they can potentially be significant. Imposing significant costs on any business carries a risk of job loss. At the same time, WDFW has taken many steps and identified many opportunities to mitigate the costs to owners. Coupled with WDFW's stated intention of prioritizing the highest impact projects, it is unlikely that the proposed rule will result in significant job losses.

2.8 SUMMARY CONCLUSIONS

The proposed rule targets structures on the landscape posing an impediment to fish passage and safety. These structures can theoretically be owned by businesses from any industry, although businesses within some industries (e.g., agriculture and forestry) are more likely to own relevant structures due to the nature of their business and their large landholding. Regardless, only a portion of any structures owned by businesses will be impacted by the rule.

Compliance costs stemming from the rule are expected to range widely depending on a number of factors. They may be as low as $100 for a small pump diversion screen to over $6 million for a complicated bridge design. Compliance cost variation, coupled with variation between industry in the minor cost threshold, suggests that the costs are likely to be more than minor in some but not all cases.

Finally, within any industry and for any particular project, the costs are expected to disproportionately impact small businesses. This is because no known relationship exists between drivers of project costs and business size, so cost per $100 of revenue, cost per employee, or cost per labor hour will almost certainly be higher for small businesses. Given the findings outlined above, WDFW has identified several actions intended to mitigate the impacts to small businesses.

REFERENCES

LEGAL AND POLICY DOCUMENTS

RCW 19.85

RCW 76.09

RCW 77.55

RCW 77.57

RCW 87.03

WAC 220-660

Washington v. *United States,* 584 U. S. ___ (2018)

PEER REVIEWED RESEARCH

Bernhardt E.S., et al. 2007. "Restoring Rivers One Reach at a Time: Results from a Survey of U.S. River Restoration Practitioners." Restoration Ecology.

Van Deynze, B., et al. 2022. "What influences spatial variability in restoration costs? Econometric cost models for inference and prediction in restoration planning." Biological Conservation.

Wilhere, G. et al. 2017. "Incorporating climate change into culvert design in Washington State, USA." Ecological Engineering.

TECHNICAL REPORTS AND OTHER NON-PEER REVIEWED RESEARCH

Blachly, B. and E. Uchida. 2017. "Estimating the marginal cost of dam removal." Environmental and Natural Resource Economics Working Papers. University of Rhode Island.

Cascadia Consulting Group. 2018. "Southern Resident Orca Task Force: Report and Recommendations." Accessed October 20, 2022 at: https://www.governor.wa.gov/sites/default/files/OrcaTaskForce_reportandrecommendations_11.16.18.pdf

Wilhere, G., et al. 2017."Incorporating Climate Change into the Design of Water Crossing Structures – Final Project Report". Washington Department of Fish and Wildlife.

ATTACHMENT A | OUTREACH SUMMARY AND LIST OF INDIVIDUALS INTERVIEWED IN OCTOBER 2022

To support development of this SBEIS, the analysis relies on outreach and participation of state and local agencies, firms that provide permitting support, design, engineering, or construction services, grant program administrators, and representatives of private property owners to provide data and information to evaluate the potential costs of the rule on small businesses. IEc relied upon several sources to identify and obtain contact information for these entities, including WDFW-provided state and local agency contacts, WDFW's database of technical assistance providers, permit information extracted from WDFW's Aquatic Protection Permitting System (APPS) database, and referrals from interviewees.

IEc conducted interviews with representatives chosen according to a variety of selection criteria. State and local agencies fall into two categories of interviewees. Some state agencies, such as Department of Ecology and Department of Natural Resources were contacted because they were named in WDFW's CR-101 filing for the proposed rule as having similar regulatory authority. Other agencies, such as county and local road and public works departments, were chosen because they are responsible for a considerable number of impacted structures. For these agencies, the number of nonexempt structures was balanced with a desire to achieve wide geographic coverage of the entire state. Department of Transportation was selected for their dual role as regulators with similar authority and as an entity responsible for many impacted structures throughout the state. IEc selected firms providing professional and construction services that cover a wide geographic area (often, statewide) and provide many relevant services (e.g., all phases of barrier removal, diversion screening, culvert and bridge installation and modification). Given the broad scope of the rule, IEc decided that reaching out to private individual owners of structures would be an inefficient strategy for reaching that population. Instead, IEc interviewed Conservation Districts, which regularly interact with private landowners on natural resource and conservation issues. IEc selected Conservation Districts balancing the number of privately owned structures in the districts with a desire to achieve wide geographic representation. Additionally, IEc conducted interviews with Washington Department of Agriculture, Washington Department of Natural Resources Forest Practice Division, and Washington State Water Resources Association to understand potential impact within the agricultural and forestry industries specifically.

The outreach process consisted of an initial email invitation to participate in an interview. Initial emails often resulted in referrals to more relevant contacts. If IEc did not receive a response, they sent at least one follow up email. In most cases, interviewees were available for a video interview during normal business hours. IEc assumed no response to the follow up as an indication that the recipient did not wish to participate in an interview.

In this case we attempted to identify an alternative interviewee from the same category. In some cases, interviewees invited additional interested individuals from their organization to participate in the interview.

Ultimately, IEc reached out to 11 state agency representatives, 5 county representatives, 4 municipal representatives, 4 Conservation District representatives, 1 grant program administrator, and 25 employees of firms providing relevant professional and construction services. As described, outreach efforts did not result in one hundred percent participation, and some additional interviewees were invited to participate in interviews by one of the interviewees we initially targeted. During October and November 2022 IEc conducted interviews with 12 state agency representatives, 4 county representatives, 5 municipal representatives, 3 Conservation District representatives, 1 grant program administrators, and 8 employees of firms providing relevant professional and construction services (Exhibit A-1).

EXHIBIT A-1. LIST OF INTERVIEWEES

DESCRIPTION OF INTERVIEWEES[1]
Consulting/engineering professional at Aspect Consulting
Consulting/engineering professional at Bridge and Culvert Design
Consulting/engineering professional at Chinook Engineering
Consulting/engineering professional at Ecoassets Environmental
Consulting/engineering professional at Herrera Inc.
Consulting/engineering professional at Marine Surveys and Assessments
Consulting/engineering professional at Talasaea
Consulting/engineering professional at Tetra Tech
Professional at Washington State Department of Natural Resources
Professional at Washington State Department of Ecology
Professional at Washington State Department of Ecology
Professional at Washington State Department of Ecology
Professional at Washington State Recreation and Conservation Office
Professional at Washington State Department of Agriculture
Professional at Washington State Water Resources Association
Professional at Washington State Water Resources Association
Professional at Cascadia Conservation District
Professional at Snohomish Conservation District
Professional at Snohomish Conservation District
Professional at Washington State Department of Transportation
Professional at Washington State Department of Transportation
Professional at Washington State Department of Transportation
Professional at Washington State Department of Transportation
Professional at Washington State Department of Transportation
Professional with Snohomish County
Professional with Snohomish County
Professional with King County

DESCRIPTION OF INTERVIEWEES[1]
Professional with King County
Professional with City of Bellevue
Professional with City of Bellevue
Professional with City of Bellevue
Professional with City of Walla Walla
Professional with City of Walla Walla

Notes:

1. Individuals are not identified by name to protect the privacy of interview participants.

ATTACHMENT B | INTERVIEW GUIDE

INTERVIEW QUESTIONS

INTRODUCTION (FOR ALL INTERVIEWEES)

- IEc is an environmental and economic consulting firm with expertise in developing regulatory analyses for state and federal agencies.
- IEc has been retained by the Washington Department of Fish and Wildlife to develop a Cost Benefit Analysis and a Small Business Economic Impact Statement for a forthcoming proposed rule that would codify existing standards for fish passage, introduce new standards for culverts and crossings, and change compliance and enforcement practices.
- The Cost Benefit Analysis compares the costs and benefits that would result from the rule, while the SBEIS considers whether the rule will disproportionately affect small businesses or impose more than minor costs on them (defined as businesses employing <50 people).
- The proposed rule seeks to improve fish passage conditions throughout the state now and into the future to support anadromous fish populations. It is motivated by Governor Inslee's Task Force dedicated to recovery of Southern Resident Orcas, which identified prey depletion as a main threat.
- For fish passage structures and diversion screens, the proposed rule codifies existing standards. For culverts and crossings, the proposed rule introduces a new requirement to consider future hydrologic conditions in design and construction, based on climate change modeling.
- The proposed rule also expands the tools available to WDFW for achieving voluntary and nonvoluntary compliance with the standards.
- Our analysis is focused on understanding the costs and benefits that are likely to arise if the proposed rule is adopted.
- We are conducting a series of interviews with relevant agencies, firms that perform screening and water crossing design, construction, and installation, and owners of existing diversions and crossings to better understand the standards and compliance behavior as they currently exist, how or if the rule might result in additional costs, and the magnitude of those costs.

FIRMS PROVIDING DESIGN, ENGINEERING, CONSTRUCTION, AND CONSULTING

1. Are you familiar with the proposed rule?
2. What geographic areas does your firm service?
3. Which of the following services does your firm perform?
    a. Diversion screening
    b. Stream barrier removal
    c. Fish passage structure installation and/or modification

   d. Culvert installation and/or modification
   e. Bridge construction and/or modification
4. Are there minimum or maximum sizes for projects your firm will undertake?
5. Who are the typical owners for each type of project?
   a. For private owners, do they tend to be commercial or residential?
      i. What types of businesses have you done work for?
   b. What portion of your work is new construction versus modifying an existing structure?
      i. For existing structures, what portion is driven by the owner seeking modification versus DFW requesting the modification?
6. *If the firm provides culvert and/or bridge services*
   a. One requirement of the proposed rule is to design culverts and crossings for expected changes to bankfull width and peak flow due to climate change, rather than current conditions, using DFW's Culverts and Climate Change web application.
      i. Has your firm been doing this currently to any extent? Using the web application? Some other modeling tool or rule of thumb?
         1. If it is recommended to clients, do they typically listen?
            a. What impacts their decision? (for example, project scale, owner type, etc.)
7. What phases are involved in the process from permit application to final inspection?
   a. Do you provide all of these services?
      i. If no:
         1. Which phases does your firm provide?
         2. Can you give us the names of firms you typically partner with to cover the remaining phases?
   b. What is the range of costs, for all phases your firm provides, for each of the following? (only those that the firm provides)
      i. Diversion screening
      ii. Stream barrier removal
      iii. Fish passage structure installation and/or modification
      iv. Culvert installation and/or modification
         1. On a fish bearing stream vs. non-fish bearing stream
         2. For current bankfull width and peak flows vs. projected future bankfull width and peak flows
      v. Bridge construction and/or modification
         1. On a fish bearing stream vs. non-fish bearing stream
         2. For current bankfull width and peak flows vs. projected future bankfull width and peak flows
   c. What causes variation in these costs?
      i. Project specifications
      ii. Geography
      iii. Condition of existing structure
      iv. Seasonality
      v. Others?

   d. Can you provide an estimate for the expected lifespan of each project type?
   e. Has your firm ever repaired, modified, or replaced an undersized culvert or crossing that was damaged from excessive flooding?
      i. Either way, can you provide a range of cost estimates for that service?
   f. What grant or loan programs are you aware of that offer cost mitigation opportunities for owners?
8. For costs, we are thinking about the permitting, design, engineering, and construction costs to landowners (the costs we have been asking about here), plus the costs to DFW of administering and enforcing the rule. Can you think of any other categories of costs that might arise as a result of the rule?
9. For benefits, we are thinking about the biological and ecological benefits of restoring fish passage and more natural flows, plus reduced flooding and avoiding unnecessary maintenance or premature replacement of culverts and crossings due to future climate impacts. Can you think of any other categories of benefits that might arise as a result of the rule?

AGENCIES WITH POTENTIALLY SIMILAR STANDARDS

1. Are you familiar with the proposed rule?
2. In what capacity (or through what specific programs) does your agency regulate stream crossing structures, fish passage, or diversion screening?
   a. In what ways does that relate to DFW's standards? Similarities? Differences?
3. Can you think of any ways that the proposed rule would affect the way your agency operates?
4. What types of owners of dams, diversions, intakes, culverts, and crossings does your agency typically interact with?
   a. For private owners, do they tend to be business or residential?
      i. What types of businesses do you interact with?
5. What grant or loan programs are you aware of that offer cost mitigation opportunities for fish passage, barrier removal, or screening projects?
6. For costs, we are thinking about the permitting, design, engineering, and construction costs to landowners (the costs we have been asking about here), plus the costs to DFW of administering and enforcing the rule. Can you think of any other categories of costs that might arise as a result of the rule?
7. For benefits, we are thinking about the biological and ecological benefits of restoring fish passage and more natural flows, plus reduced flooding and avoiding unnecessary maintenance or premature replacement of culverts and crossings due to future climate impacts. Can you think of any other categories of benefits that might arise as a result of the rule?

PUBLIC OR LARGE COMMERCIAL OWNERS

1. What types and how many of each type of structure is your agency/business responsible for?

   a. Diversion screens
   b. Dams or other barriers
   c. Culverts
   d. Crossings
2. Are you familiar with the standards for fish passage and screening set by DFW?
3. Are you aware of the proposed rule and what it does?
4. For culverts and crossings, do expected future climate conditions (for example, projected changes to bankfull width and peak flows) play a role in your decision making?
   a. Will considering future climate conditions save money in the long run? (for example, from maintenance and repair, or reduced flood damage)
5. For costs of the rule, we are thinking about the permitting, design, engineering, and construction costs to landowners (the costs we have been asking about here), plus the costs to DFW of administering and enforcing the rule. Can you think of any other categories of costs that might arise as a result of the rule?
6. For benefits of the rule, we are thinking about the biological and ecological benefits of restoring fish passage and more natural flows, plus reduced flooding and avoiding unnecessary maintenance or premature replacement of culverts and crossings due to future climate impacts. Can you think of any other categories of benefits that might arise as a result of the rule?

GRANT PROGRAMS

We are particularly interested in understanding your program and how it can help offset some of the costs that owners will face as a result of the proposed rule.

1. Please describe the program
   a. What projects are eligible?
      i. Certain types, geographies, etc.
   b. Who is eligible?
      i. Certain types of owners, etc.
   c. Are there some prioritization criteria?
      i. Are certain project or owner types more likely to receive funding?
   d. Are there any costs associated with the application process?
   e. What is the range of assistance provided for different projects?
      i. Diversion screening
      ii. Stream barrier removal
      iii. Fish passage structure installation and/or modification
      iv. Culvert installation and/or modification
      v. Bridge construction and/or modification
   f. How is the program funded?
   g. Is the size of the program expected to change in the future?

    h. What types of entities have received funding in the past?
        i. We are especially interested in characterizing any private businesses
2. What other programs are you aware of that offer cost offsetting opportunities for these types of projects?
3. For costs of the rule, we are thinking about the permitting, design, engineering, and construction costs to landowners (the costs we have been asking about here), plus the costs to DFW of administering and enforcing the rule. Can you think of any other categories of costs that might arise as a result of the rule?
4. For benefits of the rule, we are thinking about the biological and ecological benefits of restoring fish passage and more natural flows, plus reduced flooding and avoiding unnecessary maintenance or premature replacement of culverts and crossings due to future climate impacts. Can you think of any other categories of benefits that might arise as a result of the rule?

ATTACHMENT C | COST ESTIMATES RECEIVED FROM ENGINEERING AND CONSULTING FIRMS (ANONYMIZED)

COST CATEGORY	DIVERSION SCREENING	DAM REMOVAL	FISH PASSAGE STRUCTURE	CULVERT INSTALLATION	BRIDGE CONSTRUCTION
Permitting	NA	$30,000 to $100,000	NA	$10,000 to $50,000	$50,000 to $100,000
Engineering and Design		$30,000 to $100,000		$30,000 to $50,000	$100,000 to $200,000
Construction		$200,000 to $1 mil		$100,000 to $500,000	$1 mil to $5 mil
Permitting	NA	NA	NA	$50,000	$50,000 to $75,000
Engineering and Design					
Construction					
Permitting	$6,000 to $10,000	$6,000 to $10,000	$6,000 to $10,000	$6,000 to $10,000	NA
Engineering and Design	NA	NA	NA	NA	
Construction					
Permitting	$20,000 to $25,000	$15,000 to $20,000	$30,000 to $40,000	$5,000 to $10,000	$15,000 to $20,000
Engineering and Design					
Construction	$50,000 to $400,000	$50,000 to $200,000	$200,000 to $800,000	$40,000 to $120,000	$120,000 to $280,000
Permitting	$15,000 to $50,000	$100,000 to $250,000	$10,000 to $25,000	$5,000 to $25,000	$5,000 to $20,000
Engineering and Design	$25,000 to $150,000	$50,000 to $350,000	$30,000 to $150,000	$20,000 to $75,000	$25,000 to $75,000
Construction	$75,000	$1.5 mil	$250,000 to $1.5 mil	$300,000 to $800,000	$280,000
Permitting	$500,000 to $4 mil	$500,000 to $4 mil	$250,000 to $400,000	$250,000 to $400,000	$400,000 to $1 mil
Engineering and Design					
Construction	NA	NA	NA	NA	NA
Permitting and Design	$2,000 to $10,000	NA	NA	$6,000 to $12,000	NA
Engineering & Construction	NA	NA	NA	NA	NA

ATTACHMENT D | DATA DICTIONARY

DATA ITEM	SOURCE
Estimates for costs associated with all phases of diversion screening, dam removal, fish passage structure installation, culvert and bridge installation in Washington	Personal and email communication with representatives of firms providing these services conducted in October and November 2022
Selected cost information for completed fish screening and culvert projects	Pacific Northwest salmon habitat project database, 2022. National Marine Fisheries Service, Northwest Fisheries Science Center. Accessed November 11, 2022 at: https://www.webapps.nwfsc.noaa.gov/pnshp/
Spatially explicit inventory of known diversions, dams, fish passage improvement structures, culverts, and crossings in Washington State	WDFW Open Data. Fish Passage Barriers Inventory. Accessed September 2022 at: https://data-wdfw.opendata.arcgis.com/documents/wdfw::fish-passage-barriers-inventory-zipped-file-geodatabase/about
Projected changes to bankfull width and 100-year peak flows throughout Washington State	Geodatabase file obtained via email from George Wilhere, Senior Research Scientist at WDFW. The data is documented in Wilhere et al. (2017) and supports WDFW's Culverts and Climate Change web application, available at: https://wdfw.wa.gov/species-habitats/habitat-recovery/fish-passage/climate-change
Boundaries of Tribal Lands in Washington State used to identify exempt structures	Washington State Department of Ecology. ECY_BND_TribalLands feature layer. Accessed September 2022 at: https://fortress.wa.gov/ecy/gisprod/arcgis/rest/services/GIS/ECYAuthoritativeGISDatasets/MapServer/12
Boundaries of federal lands in Washington State used to identify exempt structures	Public Lands Inventory feature layer. Accessed September 2022 at: https://services2.arcgis.com/TGEC20q86HQAeMS6/ArcGIS/rest/services/Public_Lands_Inventory_2/FeatureServer
Total land area in Washington State devoted to agriculture	Washington State Department of Agriculture. Agricultural Land Use. Accessed October 6, 2022 at: https://agr.wa.gov/departments/land-and-water/natural-resources/agricultural-land-use
Number of establishments and average annual payroll by industry in Washington State	United States Bureau of Labor Statistics. 2020 Total Wages and Number of Establishments. Accessed via ORIA at: https://www.oria.wa.gov/site/alias__oria/3192/minor-cost-threshold-calculator.aspx

DATA ITEM	SOURCE
Proportion of businesses considered small by industry in Washington State	Washington State Employment Security Department. 2020 Labor Market and Economic Data. Accessed via ORIA at: https://www.oria.wa.gov/site/alias__oria/3192/minor-cost-threshold-calculator.aspx
Average annual revenue by industry in Washington State	Washington State Department of Revenue. 2020 Gross Business Income and Number of Establishments. Accessed via ORIA at: https://www.oria.wa.gov/site/alias__oria/3192/minor-cost-threshold-calculator.aspx