

### Introduction

The following report summarizes the state's efforts to address barriers to tide gate repair, replacement, and removal. Tide gates are used to control water in tidally influenced areas along the Oregon Coast and lower portions of the Columbia River Basin. Many tide gates are aging and no longer provide the water control functions needed by local communities. They are also often barriers to fish passage.

The Oregon Watershed Enhancement Board (OWEB) and the Association of Oregon Counties convened the Tide Gate Partnership beginning in 2017 to identify and address barriers to more tide gate repair, replacement and removal projects. Barriers discussed include the complex permitting process and a very limited number of engineers and contractors familiar with the work.

This report summarizes the products that resulted from the Tide Gate Partnership's work and the lessons learned regarding possible solutions.

### Background

In Oregon, tide gates are commonly used to control water in tidally influenced areas along the coast and lower portions of the Columbia River Basin. Traditionally, tide gates are constructed by integrating one-way doors (i.e., the tide gate) into a dike. Freshwater drains from streams above the tide gate during outgoing tides. Water pressure from incoming tides closes the gate, protecting agriculture, infrastructure, and other developed landscapes from tidal inundations. Unfortunately, preventing inundation can also slow or prevent tidal flows into the estuaries, which can impede the migration of native fish, diminish water quality, and reduce estuarine ecological functions.

The tide gate infrastructure in Oregon is aging and in need of repair, replacement, or removal. There are many reasons that it is important to address Oregon's aging tide gates. Some aging tide gates act as fish passage barriers. Some failing tide gates are no longer able to provide road access to coastal neighborhoods or allow agricultural activities to occur.

OWEB and other funding agencies have supported tide gate repair, replacement and removal projects. OWEB has also provided grants for technical assistance, community engagement, and post-project monitoring. While projects funded by OWEB and other funding partners continue to occur, OWEB and partners hear from local partners that significant barriers and challenges prevent or delay many opportunities.

The tools and resources developed by the Tide Gate Partnership are intended to help address the challenges of repairing this aging tide gate infrastructure and provide assistance to tide gate owners in coastal Oregon.

### Early Conversations & Work Planning

The Oregon Tide Gate Partnership began as a coordinated effort of state and federal agencies, agriculture and conservation organizations, county leaders, and coastal landowners. Together, the partnership established a set of priorities, tools, resources, and actions for tide gate work in Oregon. The goals of these tools are to achieve more resilient coastal communities by protecting landscapes that support local economies and enhancing the ecological function of Oregon's estuaries for fish and wildlife.

## Barriers and Possible Solutions to Tide Gate Repair, Replacement, and Removal

**Barriers to more widespread repair, replacement, and removal of tide gates include the following factors:**

- The scope and scale of tide gates on the Oregon coast was largely unknown
- Complex and lengthy permitting process
- Limited local partner capacity to navigate the permitting process
- Complex design and engineering needed
- Tide gate upgrades are expensive, and funding is primarily limited to conservation grant programs
- Limited contractor and engineering expertise and availability
- Lack of funding for projects without strong ecological uplift
- Limited manufacturing capacity
- Legally complex and high level of liability for project implementors

In response to the issues that were identified as the key barriers to tide gate repair, replacement, and removal, the Partnership identified several technical needs that would help support tide gate project development. The next few sections discuss the products that were developed to address these identified needs.

### Tide Gate Inventory

The Tide Gate Inventory allows for a greater understanding of the issue of aging tide gate infrastructure on the Oregon coast, by identifying the number and location of existing tide gates and the resources upstream and downstream of these structures. It provides a framework to consider risks, benefits, costs, and appropriate solutions.

- [The Oregon Tide Gate Inventory](#) was first published on Oregon Explorer in 2019. This inventory was developed by the Institute for Natural Resources (INR) at Oregon State University using publicly available information including existing local tide gate inventories and Google Earth imagery.
- Starting in 2020 and ending in 2022, a coordinated effort led by The Nature Conservancy utilized the Oregon Tide Gate Inventory to ground-truth the location of primary tide gates throughout the Oregon Coast and the Lower Columbia River Basin to update the Oregon Tide Gate Inventory on Oregon Explorer. **Management and long-term maintenance of the inventory to keep it updated is a concern. When restoration practitioners complete tide gate upgrade projects, a standardized process is needed to ensure updated data is provided to INR.**

### Decision Support Tool(s)

With more than 1,000 tide gates on the Oregon coast, determining which tide gates to prioritize can be challenging. In response to this challenge, two different tools were developed with the intention of helping to prioritize and optimize tide gate upgrade projects.

1. [The Tide Gate Decision Support Tool](#) was developed as a planning tool to identify priority tide gate project sites from a multitude of perspectives. The optimization tool, developed by The Nature Conservancy, can be used by funders, local governments, restoration partners, and others to evaluate project sites at a local, regional, or coast-wide scale for a variety of potential outcomes, including, for example, agricultural land protection, economic development benefits, community benefits, flood reduction, community resilience, infrastructure improvements, water quality, ecosystem function, and fish habitat. **It will take ongoing resources and effort to keep the tool updated over time.**
2. The Tide Gate Ecological Uplift “model” was developed by the Oregon Department of Fish and Wildlife (ODFW) using a number of ecological considerations focused on the habitat potential upstream of a tide gate if the gate were to be upgraded. This is a static list created using a Bayesian probabilistic model to prioritize known tide gates 1-1000+. **If a tide gate were to be repaired or replaced, the model would need to be run again in order to re-do the prioritization.**

## Engineering Tool

All engineering designs for tide gate upgrade projects must meet local, state, and federal regulatory requirements to construct the project, including for fish passage. **The preparation of engineering plans can be challenging and costly.** The Partnership identified the need for engineering resources to simplify the design and reduce the cost of project engineering.

### Several concepts were explored, including:

1. Making tide gates 3 feet in diameter and smaller exempt from Oregon Fish Passage requirements. There was opposition to this within the partnership because there are so many tide gates under 3 feet in diameter that are significant barriers to fish passage. The Cattleman's Association worked with legislators to propose legislation for the exemption that was ultimately unsuccessful.
2. Developing a one-size-fits-all, plug-and-play-type design for tide gates 3 feet in diameter and smaller that landowners could use without having to hire an engineer. This idea had some support among the Partnership. However, discussions with tide gate engineers raised issues about the site-specific considerations that factor into a tide gate design. For example, the elevation of the land, the elevation that infrastructure (i.e., roads, barns, houses, pastures) sits at, and the area of inundation (how much water will flood to what elevation behind the tide gate) are specific to each property. A one-size fits all design could work on some sites, but could flood important infrastructure on others. Because of that realization and knowledge, the idea was considered infeasible.
3. Ultimately, the group agreed that trying to bring efficiency to the design process through modeling a complex part of the engineering could save tide gate owners time and money. OWEB worked with the Coquille Watershed Association, the Coos Watershed Association, ODFW, National Oceanic and Atmospheric Administration (NOAA), and an engineering firm, Northwest Hydraulic Consultants (NHC), to develop an engineering tool focused on pipe-sizing for tide gates under eight feet in size. It is a model that is intended to serve as a simple tool for both landowners and technical support organizations that possess the necessary construction knowledge and resources, to properly size and install a tide gate pipe that fulfills both state and federal fish passage regulations. The tool provides insight into potential materials costs. It also can be incorporated into the overall project design, which can reduce the design time and associated cost. [The tool is available to the public online](#) and OWEB staff are working to create a subdomain through the tide gate partnerships website. **There is still a question of where this model will be housed long term in order to be accessible by the public.**

## Regulatory Streamlining

**The regulatory review and permitting process for tide gate upgrade projects includes several local, state, and federal approvals that can be challenging and time-consuming to navigate. To alleviate those challenges, the Tide Gate Partnership set out to:**

1. Develop an interagency team to consider regulatory coordination and streamlining. This team was made up of the "core fish agencies" involved in tide gate permitting including Department of State Lands (DSL), ODFW, NOAA, and United States Army Corps of Engineers (USACOE). In addition to program staff, state agency directors and deputies and federal agency assistant regional administrators were deeply involved.
2. Develop regulatory process maps for each agency involved in the permitting process. OWEB hired a Hatfield Fellow to develop interview questions and conduct interviews with a representative of each agency involved in the regulatory process for tide gate projects.
3. Develop a comprehensive process map for regulatory review and permit approval of tide gate projects based on agency process maps. While this was considered a major accomplishment and a lot was learned about the role of each agency, the permitting process is still recognized by restoration practitioners and agency staff as a

challenge to project implementation. Agencies, particularly federal agencies, have experienced issues with capacity. Since that time, the OWEB Tide Gate Coordinator has continued to host monthly meetings with agency staff and developed a more detailed regulatory process map to provide further clarity in the tide gate permitting process.

The core fish agencies also spent significant time considering how they might prioritize their workload should an influx of tide gate projects apply for permits (at the time, we believed that dozens of tide gate projects were in the pipeline and had the potential to overwhelm staff – projects have been a steady stream, but not overwhelming in number). They went through a process of categorizing tide gate projects based on ecological uplift potential and willingness of the landowner. The graphic for the category binning and a description of the “binning” conversation is available upon request.

The agencies also discussed whether it would be possible to reduce the duplication in project review through true regulatory streamlining. Once it was determined that this would likely require formal agreements and delegation of authorities among agencies, it was determined to be infeasible at the time. **Staff turnover and limited engagement with county level staff continue to slow progress. Documentation of discussion and resources are available for agencies to re-engage on the streamlining topic at any point.**

### Tide Gate Monitoring Guidance

The [Tide Gate & Tidal Wetland Monitoring: Guidance and Protocols for Estuary Practitioners](#) handbook was published in 2024 with funding from OWEB in collaboration with the Coquille Watershed Association, the Nature Conservancy, and the Tillamook Estuaries Partnership and input from the Columbia River Estuary Study Taskforce, the Confederated Tribes of Siletz Indians, and Laura Brophy at the Institute for Applied Ecology.

Tide Gate & Tidal Wetland Monitoring Guidance & Protocols for Estuary Practitioners aims to establish a statewide standard for recordkeeping and monitoring that unites the restoration community under a single, well-defined set of reporting standards, protocols, and procedures to monitor tide gate upgrade and replacement projects. **Widespread adoption and a repository for monitoring results has been identified as a future need.**

### Tide Gate Coordinator Position

The Tide Gate Partnership identified a coordinator/navigator position as a need to help project developers navigate the complex regulatory and funding process for tide gate projects. The USDA-Natural Resources Conservation Service provided cooperative agreement funds to OWEB to provide this coordination role. With these funds, OWEB provided project management and subject matter expertise for grant-funded projects that produced the products described in this report. OWEB also anticipated that local partners and landowners could reach out to the coordinator for assistance navigating the permitting process; however, the coordinator received very few requests for this assistance.

### Conclusions and next steps

As of today, local partner organizations continue to pursue and, in some cases, implement tide gate repair, replacement, and removal projects. However, OWEB and funding partners continue to hear from local partners that there is a significant backlog of opportunities that is not being addressed at the current pace of project work. Several key challenges remain that prevent more widespread development of these projects. The permitting process remains a key challenge. Since the initial partnership conversations, **limited contractors and materials have also been identified as challenges that need to be addressed.**

**Several of the permitting agencies are struggling with staffing challenges that compound the difficulty of the permitting process. In some cases, permitting agencies have simply been unable to find candidates for key position vacancies.**

OWEB received approval in its 2023-2025 biennial budget to continue the federally funded tide gate coordination work. In addition to creating this report, OWEB will convene the Partnership to review the products created as a result of the Tide Gate Partnership efforts, discuss remaining challenges (**identified in bold**), and explore next steps.